

Annexure D

Unexpected Finds Procedure - Biodiversity

HumeLink West

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Definitions

Abbreviation	Expanded text
BCD	Biodiversity Conservation Trust
BMP	Biodiversity Management Sub-plan
CEMP	Construction Environmental Management Plan
EES	Energy and Environmental Service
FCNSW	Forestry Corporation of New South Wales
HLW	The HumeLink West Stage of the HumeLink project
HLWJV	HumeLink West Joint Venture (UGL Limited and CPB Contractors)
KNP	Kosciusko National Park
MCoA	NSW Minister's Conditions of Approval
NPWS	National Parks and Wildlife Service
UMM	Updated Environmental Management Measure as outlined in the Planning Approvals Documentation

1. Introduction

1.1. Context

This Unexpected Finds Procedure (the procedure) forms part of the Biodiversity Management Sub-plan (BMP) of the HumeLink West project (HLW) Construction Environmental Management Plan (CEMP). The procedure has been prepared to outline and describe how the UGL Limited and CPB Contractors Joint Venture (HLWJV), during the construction of HLW, will comply with the Minister's Conditions of Approval (MCoA), the Updated Environmental Management Measures (UMM), and undertake its duties in accordance with the Planning Approval Documentation listed under MCoA A2.

1.2. Purpose

This procedure is applicable to all activities which have the potential to impact upon threatened flora and fauna species that are incidentally encountered during pre-clearance works, and those that have not already been assessed and approved. The procedure aims to address relevant actions and mitigation measures outlined in the following documents:

- Mitigation measure B3 and B20 of the *HumeLink Biodiversity Development Assessment Report Rev 0* (Revised BDAR; Niche Environment and Heritage Pty Ltd, June 2024).
- Condition B25 and B30 of Minister's Conditions of Approval (MCoA) A2.
- Condition 2 and 7 of Federal Minister for Water and Environment Condition of Ministerial Approval.

2. Unexpected finds procedure

The overarching HLW CEMP unexpected finds flowchart is displayed in Figure 2-1. The unexpected finds procedure specific to biodiversity is further detailed in Table 2-1.

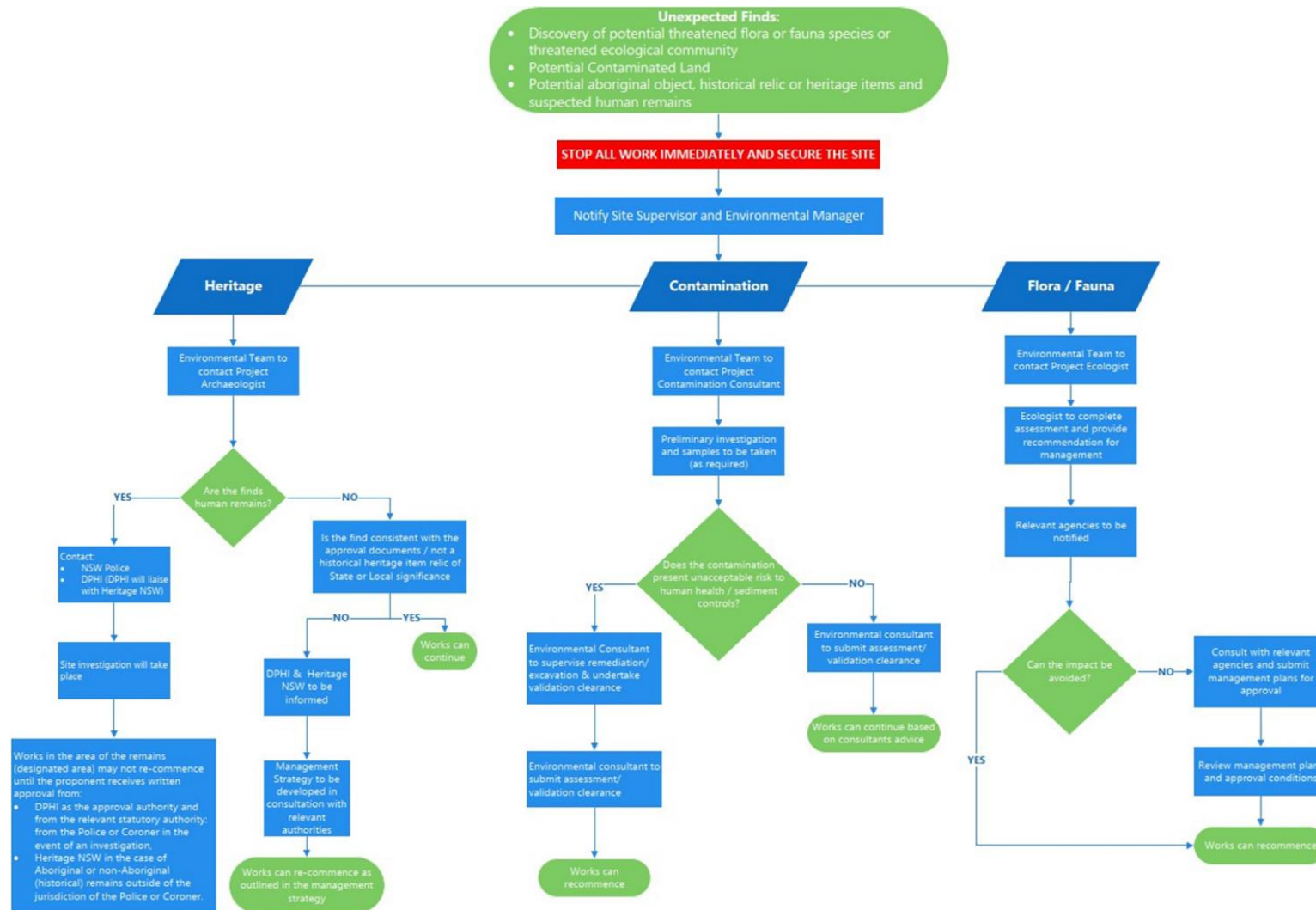


Figure 2-1 Overarching HLW CEMP unexpected finds flowchart

Table 2-1 Unexpected finds procedure

1. Threatened species/TEC is unexpectedly encountered during clearing or construction activities:	Responsible Authority
STOP ALL WORK in the vicinity of the record. - Immediately notify the Environment Team. The Environment Team will then contact the Project Ecologist. - The Project Ecologist and/or Environment Team will advise Transgrid's Representative of the unexpected find. - The Project Ecologist or delegated other will assess potential impacts on a case-by-case basis as detailed below.	- Environment Team. - Project Ecologist. - Transgrid's Representative.
2. Assessment of Impact	
An assessment is to be undertaken by the Project Ecologist to verify the flora, fauna (to species level) or community and the likely impact to the threatened entity, including consideration of steps 2A, 2B and 2C (below). These steps may be used in combination if appropriate for the situation.	Project Ecologist.
2A. Can the impact be avoided?	
Project Ecologist to determine whether the threatened entity, and/or surrounding area can be avoided by the construction or clearing works: - Avoidance measures (where possible) to be implemented as soon as reasonably appropriate (such as clearer delineation of area) by Project Ecologist or delegated other. - Immediately notify Environment Team if an avoidance measure is implemented. The Environment Team will advise relevant teams and Transgrid's Representative. - Proceed to next step (also proceed if avoidance is not appropriate for the situation).	- Project Ecologist or delegated other. - Environment Team. - Transgrid's Representative.
2B. Can the impact be minimised?	
Project Ecologist to determine whether the impact can be minimised (such as machinery approach) on the threatened entity: - Minimisation measures (where possible) to be implemented as soon as reasonably appropriate by Project Ecologist or delegated other. - Immediately notify Environment Team if a minimisation measure is implemented. The Environment Team will advise relevant teams and Transgrid's Representative. - Proceed to next step (also proceed if minimisation is not appropriate for the situation).	- Project Ecologist or delegated other. - Environment Team. - Transgrid's Representative.
2C. Can the impact be mitigated?	
Project Ecologist to determine whether the impact to threatened entity can be mitigated (such as permanent no-go zone establishment): Mitigation measures (where possible) to be implemented as soon as reasonably appropriate by Project Ecologist or delegated other.	- Project Ecologist or delegated other. - Environment Team.

- Immediately notify Environment Team if a mitigation measure is implemented. The Environment Team will advise relevant teams and Transgrid's Representative. - Proceed to next step (also proceed if mitigation is not appropriate for the situation).	Transgrid's Representative.
3. Reporting and evaluation	
If threatened species are detected as unexpected finds, this will be reported to Transgrid and CPHR within one month of incident. Project Ecologist and/or delegated other will outline appropriate management options such as avoidance, minimisation or mitigation measures, developed in consultation with Transgrid and Planning Secretary, CPHR and DCCEEW – Cwth. Update management plans (where relevant) to reflect minimisation and avoidance measures where necessary. Where the situation is unable to avoid, minimise, or mitigate the impact on the threatened entity, justification for why needs to be provided to Transgrid and Planning Secretary, CPHR and DCCEEW – Cwth. Project Ecologist, Environment Team and/or Transgrid Representative to consult with Planning Secretary, CPHR and DCCEEW – Cwth regarding proposed measures, impacts and follow-up actions.	- Transgrid's Representative and/or Planning Secretary, CPHR and DCCEEW – Cwth (if relevant) . - Project Ecologist or delegated other - Environment Team
4. Approvals	
If required, obtain any relevant license, permits or approvals to impact the threatened entity. The responsibility may depend on the type of approval required.	- Transgrid's Representative and/or Planning Secretary, CPHR and DCCEEW – Cwth (if relevant) . - Project Ecologist or delegated other - Environment Team
5. Recommencement of Work	
Relevant agencies are to be consulted identified in steps 3 and 4. Construction or operation works may recommence once the Planning Secretary has informed Transgrid and HLWJV (during construction) that the following has occurred: - Approvals are obtained as required, and it is confirmed that all corrective actions and additional mitigation measures have been implemented. - Ensured that the threatened entity is included in subsequent Site Environmental Plans, Project Inductions and Toolbox Talks. - Information has been provided to Transgrid and relevant stakeholders to ensure ecological monitoring requirements are updated and/or biodiversity offsets are considered.	Transgrid.

3. Species identification guide

Table 3-1 Species identification guide

Common Name <i>Scientific name</i>	EPBC Act Status	BC Act Status	FM Act Status	Identification. Source: Australian Museum, 2022; DPI, 2025; DCCEEW – NSW, 2025a; DCCEEW – NSW, 2025b; DCCEEW - NSW, 2025c	Photo. Source: Birdlife Australia, 2022; EBIRD, 2025; DPI, 2025; DCCEEW – NSW, 2025c	Status within HLW
Regent Honeyeater <i>Anthochaera phrygia</i>	Critically Endangered	Critically Endangered		Description: a medium sized bird, with distinctive black and yellow colouring. Adults weigh 35 - 50 grams, are 20 - 24 cm long and have a wingspan of 30 cm. Its head, neck, throat, upper breast and bill are black, and the back and lower breast are pale lemon in colour with a black scalloped pattern. Its flight and tail feathers are edged with bright yellow. There is a characteristic patch of dark pink or cream-coloured facial-skin around the eye. Sexes are similar, though males are larger, darker and have larger patch of bare facial-skin. Habitat: Mainly inhabit temperate woodlands and open forests of the inland slopes of south-east Australia. Can also be found in drier coastal woodlands and forests in some years. Habitat requirement (breeding): As per Important Habitat Map.		Assumed present (foraging only)
Dusky Woodswallow <i>Artamus cyanopterus</i>		Vulnerable		Description: is a medium-sized bird (16-19.5 cm, 35 g), with a longish tail. Mostly dark grey-brown, merging to blackish on the tail, with a small black-brown mask. Bluish bill with a black tip. Upper-wings are a dark blue-grey with a white leading edge. Conspicuous white corners on the tail. In flight the dark grey-brown under-body contrasts with the whitish under-wing. Juveniles may be distinguished by white streaking on the body and whitish tips on wing feathers. Immature individuals are similar to adults but retain pale-tipped wing feathers. No seasonal variation in appearance is evident, and sexes are alike. Habitat: Primarily inhabit dry, open eucalypt forests and woodlands, including mallee associations, with an open or sparse understorey of eucalypt saplings, acacias and other shrubs, and ground-cover of grasses or sedges and fallen woody debris. It has also been recorded in shrublands, heathlands and very occasionally in moist forest or rainforest. Also found in farmland, usually at the edges of forest or woodland.		Recorded - 1 individual within non- native vegetation

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Bush Stone-curlew <i>Burhinus grallarius</i>		Endangered		Description: stand around 55 cm tall. It has a grey to light brown back, marked with black blotches, and a streaked rump. It has buff and white underparts with dark streaks, and a black band that runs from near its eye down its neck. This species has large, bright yellow eyes and a hunch-shouldered stance on long spindly legs. Habitat: Inhabits open forests and woodlands with a sparse grassy ground layer and fallen timber. Foraging: Feed on insects and small vertebrates, such as frogs, lizards and snakes.		Assumed present
Gang-gang Cockatoo <i>Callocephalon fimbriatum</i>	Endangered	Endangered		Description: are primarily slate-grey, with the males easily identified by their scarlet head and wispy crest, while females have a grey head and crest and feathers edged with salmon pink on the underbelly. They range in length from 32 to 37 cm, with a wingspan of 62 to 76 cm. Habitat: in spring and summer, generally found in tall mountain forests and woodlands, particularly in heavily timbered and mature wet sclerophyll forests. In autumn and winter, the species often moves to lower altitudes in drier more open eucalypt forests and woodlands, particularly box-gum and box-ironbark assemblages, or in dry forest in coastal areas and often found in urban areas. May also occur in sub-alpine Snow Gum (<i>Eucalyptus pauciflora</i>) woodland and occasionally in temperate rainforests. Habitat requirement (breeding): Hollow bearing trees within Eucalypt tree species with hollows at least 3 m above the ground, and with hollow diameter of 7 cm or larger.		Recorded - 18 individuals within PCT 295, 299, 638 and non-native vegetation; 19 individuals within PCT 268, 277, 280 and 316; 80 individuals within PCT 300, 638, 679, 953, 1196 and non-native vegetation

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South-eastern Glossy Black-Cockatoo <i>Calyptorhynchus lathami lathami</i>	Vulnerable	Vulnerable		Description: is a small brown-black cockatoo with a massive, bulbous bill and a short crest. Males have a prominent red tail panel, while that of females is yellow to orange-red. The coloured tail panel is barred black in juvenile birds, with the extent of barring decreasing with age. The female usually has irregular pale-yellow markings on the head and neck, and may have yellow flecks on the underparts and underwing. Habitat: Inhabits open forest and woodlands of the coast and the Great Dividing Range where stands of sheoak occur. Habitat requirement (foraging): Presence of Allocasuarina and casuarina species Habitat requirement (breeding): Hollow bearing trees, Living or dead tree with hollows greater than 15cm diameter and higher than 8m above ground.		Assumed present
Speckled Warbler <i>Chthonicola sagittata</i>		Vulnerable		Description: is a small well-camouflaged very heavily streaked ground-dwelling bird related to the scrubwrens, reaching a length of 13cm. The back, wings and tail are grey-brown, with soft dark streaks. The black crown is distinctively streaked with buff. The underparts are pale and particularly heavily streaked. The face is off-white with streaking on the ear coverts. The male has a black upper margin to the brow, while the female has a rufous upper edge to the brow. The dark tail is held horizontally, although in flight the spread tail shows a wide black band above white tips of the outer tail feathers. Habitat: lives in a wide range of <i>Eucalyptus</i> dominated communities that have a grassy understorey, often on rocky ridges or in gullies. Typical habitat would include scattered native tussock grasses, a sparse shrub layer, some eucalypt regrowth and an open canopy.		Recorded

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Spotted Harrier <i>Circus assimilis</i>		Vulnerable		Description: is a medium-sized, bird of prey having an owl-like facial ruff that creates the appearance of a short, broad head, and long bare yellow legs. The upperparts are blue-grey with dark barring, and the wingtips are black. The face, inner wing patch, and underparts are chestnut. The long tail is boldly banded, with a wedge-shaped tip. Juveniles are mottled and streaked ginger and brown, with prominent ginger shoulders, fawn rump and banded tail. Habitat: Occurs in grassy open woodland including <i>Acacia</i> and mallee remnants, inland riparian woodland, grassland and shrub steppe. It is found most commonly in native grassland, but also occurs in agricultural land, foraging over open habitats including edges of inland wetlands. Foraging: Preys on terrestrial mammals (e.g. bandicoots, bettongs, and rodents), birds and reptile, occasionally insects and rarely carrion.		Assumed present
Brown Treecreeper (eastern subspecies) <i>Climacteris picumnus victoriae</i>	Vulnerable	Vulnerable		Description: is a grey-brown bird with black streaking on the lower breast and belly and black bars on the undertail. Pale buff bands across the flight feathers are obvious in flight. The face is pale, with a dark line through the eye, and a dark crown. Sexes differ slightly in all plumages, with small patches of black and white streaking on the centre of the uppermost breast on males, while the females exhibit a rufous and white streaking. Juveniles differ from adults mainly by the pattern of the under-body, and by their pale bill and gape. Habitat: Found in eucalypt woodlands (including Box-Gum Woodland) and dry open forest of the inland slopes and plains inland of the Great Dividing Range; mainly inhabits woodlands dominated by stringybarks or other rough-barked eucalypts, usually with an open grassy understorey, sometimes with one or more shrub species; also found in mallee and River Red Gum (<i>Eucalyptus camaldulensis</i>) Forest bordering wetlands with an open understorey of acacias, saltbush, lignum, cumbungi and grasses.		Recorded

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Varied Sittella <i>Daphoenositta chrysoptera</i>		Vulnerable		Description: is a small (10 cm) songbird with a sharp, slightly upturned bill, short tail, barred undertail, and yellow eyes and feet. In flight the orange wing-bar and white rump are prominent. In NSW most individuals have a grey head and are streaked with dark brown, but in the extreme north-east they have a white head, and in the extreme south-west a black cap. Habitat: Inhabits eucalypt forests and woodlands, especially those containing rough-barked species and mature smooth-barked gums with dead branches, mallee and <i>Acacia</i> woodland. Foraging: Feeds on arthropods gleaned from crevices in rough or decorticated bark, dead branches, standing dead trees and small branches and twigs in the tree canopy.		Recorded
Purple-crowned Lorikeet <i>Glossopsitta porphyrocephala</i>		Vulnerable		Description: is a small (17-18.5cm) parrot. Upper parts are bright green, with a wash of bronze across the nape and mantle, while underparts are greenish-yellow with a pale blue belly. The crown is purple, appearing black in the field while the ear coverts and forehead are orange-yellow. The bend of the wing is narrowly edged bright blue while the underwing coverts are bright red and obvious in flight. Habitat: Found in open forests and woodlands, particularly where there are large flowering eucalypts. Also recorded from mallee habitats. Foraging: Feed primarily on nectar and pollen of flowering Eucalypts, including planted trees in urban areas.		Assumed Present
Little Lorikeet <i>Glossopsitta pusilla</i>		Vulnerable		Description: is a small (16-19 cm; 40 g) bright green parrot, with a red face surrounding its black bill and extending to the eye. The undertail is olive-yellow with a partly concealed red base, and the underwing coverts are bright green. The mantle is imbued with light brown. Habitat: primarily in the canopy of open <i>Eucalyptus</i> forest and woodland, yet also finds food in <i>Angophora</i>, <i>Melaleuca</i> and other tree species. Riparian habitats are particularly used, due to higher soil fertility and hence greater productivity. Foraging: Feeds mostly on nectar and pollen, occasionally on native fruits such as mistletoe, and only rarely in orchards.		Assumed Present

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Painted Honeyeater <i>Grantiella picta</i>	Vulnerable	Vulnerable		Description: is a small (16 cm) and distinctive, with a black head and back and white underparts with dark streaks on the flanks. The wings and tail are black with bright yellow edgings. The distinctive bill is pink with a dark tip. The female is greyer or browner than the male on the upperparts and has less streaking on the flanks. Juvenile colouration is even paler than females, appearing brown rather than black, with paler yellow edgings, and a brown bill. Habitat: Inhabits Boree/ Weeping Myall (<i>Acacia pendula</i>), Brigalow (<i>A. harpophylla</i>) and Box-Gum Woodlands and Box-Ironbark Forests. Foraging: A specialist feeder on the fruits of mistletoes growing on woodland eucalypts and acacias. Prefers mistletoes of the genus <i>Amyema</i>. Habitat requirement (General): Mistletoes present at a density of greater than five mistletoes per hectare.		Assumed Present
White-bellied Sea-Eagle <i>Haliaeetus leucogaster</i>		Vulnerable		Description: is a large eagle that has long broad wings and a short, wedge-shaped tail. It measures 75–85 cm in length and has a wingspan of 180–220 cm. Adults are predominantly white and grey. The head, breast and belly, and the feathering on the legs, are white. The back and upper surfaces of the wings are grey, and the undersides are greyish-black with a smaller area of white along the leading edge. The tail is grey at the base and has a white tip. The large, hooked bill is grey with a darker tip, and the eye is dark brown. The legs and feet are cream-white, with long black talons. Habitat: Occurs at sites near the sea or sea-shore, such as around bays and inlets, beaches, reefs, lagoons, estuaries and mangroves; and at, or in the vicinity of freshwater swamps, lakes, reservoirs, billabongs and saltmarsh. Foraging: Feed mainly on fish and freshwater turtles, but also waterbirds, reptiles, mammals and carrion. Habitat requirement (foraging): Waterbodies, or within 1km of a rivers, lakes, large dams or creeks, wetlands and coastlines. Habitat requirement (breeding): Living or dead mature trees within suitable vegetation within 1km of a rivers, lakes, large dams or creeks, wetlands and coastlines.		Recorded - 1 individual within PCT 266

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Little Eagle <i>Hieraaetus morphnoides</i>		Vulnerable		Description: is a medium-sized bird of prey that occurs in two colour forms: either pale brown with an obscure underwing pattern, or dark brown on the upper parts and pale underneath, with a rusty head and a distinctive underwing pattern of rufous leading edge, pale 'M' marking and black-barred wingtips. Both forms have a black-streaked head with a slight crest, a pale shoulder band on the upperwings, a rather short and square-tipped barred tail, and feathered legs. Habitat: Occupies open eucalypt forest, woodland or open woodland. Sheoak or <i>Acacia</i> woodlands and riparian woodlands of interior NSW are also used. Foraging: Preys on birds, reptiles and mammals, occasionally adding large insects and carrion. Habitat requirement (general): Nest trees, species live (occasionally dead) large old trees within vegetation.		Recorded – 2 individuals within non-native vegetation
White-throated Needletail <i>Hirundapus caudacutus</i>	Vulnerable	Vulnerable		Description: is a large (20 cm in length and approximately 115–120 g in weight) swift with a thickset, cigar-shaped body, stubby tail and long pointed wings. Sexes are alike, with no seasonal variation, and juveniles are separable with good visibility. The adults have a dark-olive head and neck, with an iridescent gloss on the crown; the mantle and the back are paler, greyish; and the upperwings are blackish, sometimes with a greenish gloss, with a contrasting white patch at the base of the trailing edge; the uppertail is black with a greenish gloss. The face is dark-olive with a narrow, white band across the forehead and lores and a white patch on the chin and throat. Habitat: they occur over most types of habitat, they are probably recorded most often above wooded areas, including open forest and rainforest, and may also fly between trees or in clearings, below the canopy.		Assumed Present

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Swift Parrot <i>Lathamus discolor</i>	Critically Endangered	Endangered		Description: is small parrot about 25 cm long. It is bright green with red around the bill, throat and forehead. The red on its throat is edged with yellow. Its crown is blue-purple. There are bright red patches under the wings. One of most distinctive features from a distance is its long (12 cm), thin tail, which is dark red. Habitat: are usually found in dry sclerophyll forests and woodlands, suburban parks and gardens, and flowering fruit trees. Habitat requirement (breeding): As per Important Habitat Map.		Assumed Present
Square-tailed Kite <i>Lophoictinia isura</i>		Vulnerable		Description: reddish, medium-sized, long-winged raptor, about the size of a Little Eagle or harrier. As with most raptors, there is sexual dimorphism in morphology with females being larger than males. Males weigh approximately 500 g while females weigh 650 g. The Square-tailed Kite has a length of 50-56 cm and wingspan of 130-145 cm. Adults have a white face with thick black streaks on the crown and finer streaks elsewhere. The saddle, rump and central upper tail coverts are blackish with grey-brown barring. The underparts are predominantly grey-brown with black tips on the grey, square-tipped tail and wing edges. Square-tailed Kites have monomorphic colouration (i.e. there are no differences between males and females). A key character in flight is the long fingered, upswept wings with a large white patch at the base of the barred 'fingers'. Habitat: Found in a variety of timbered habitats including dry woodlands and open forests. Shows a particular preference for timbered watercourses. Is a specialist hunter of passerines, especially honeyeaters, and most particularly nestlings, and insects in the tree canopy, picking most prey items from the outer foliage. Habitat requirement (breeding): Nest trees.		Assumed Present

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South-eastern Hooded Robin <i>Melanodryas cucullata cucullata</i>	Endangered	Endangered		Description: is a large robin reaching 17 cm in length. The male is strikingly marked in black and white, with a bold black hood extending down a white breast. The back is black with distinct white shoulder and wing-bar. The tail is black, with prominent white side-panels. Females and immatures are duller, with light brownish-grey upperparts, but the same striking black and white wings. Habitat: Prefers lightly wooded country, usually open eucalypt woodland, acacia scrub and mallee, often in or near clearings or open areas.		Assumed Present
Black-chinned Honeyeater (eastern subspecies) <i>Melithreptus gularis gularis</i>		Vulnerable		Description: reaching 17 cm in length. The cap is black, with a white crescent around the nape, and there is a diagnostic black 'chin' beneath the bill and extending down the white throat (though this can be difficult to see in the field). There is a small crescent of blue skin above the eye. The back and wings are a dull olive-green and the tail is greyish-brown. The underparts are white, with a greyish-buff tint on the breast. The bill is short, black and slightly downcurved. Habitat: Occupies mostly upper levels of drier open forests or woodlands dominated by box and ironbark eucalypts, especially Mugga Ironbark (<i>Eucalyptus sideroxylon</i>), White Box (<i>E. albens</i>), Inland Grey Box (<i>E. microcarpa</i>), Yellow Box (<i>E. melliodora</i>), Blakely's Red Gum (<i>E. blakelyi</i>) and Forest Red Gum (<i>E. tereticornis</i>).		Assumed Present

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Turquoise Parrot <i>Neophema pulchella</i>		Vulnerable		Description: the male Turquoise Parrot is a highly distinctive bird with bright green upperparts and a turquoise-blue crown and face. Its shoulders are turquoise-blue, grading to deep blue at the flight-feathers. It has a chestnut-red patch on the upper-wing. The upper-breast of the Turquoise Parrot has an orange tint, while the yellow abdomen may have an orange centre. Females and immature individuals are generally duller, have whitish lores, a green, rather than yellow throat and breast and no red on the shoulder and upper-wing area. Habitat: Lives on the edges of eucalypt woodland adjoining clearings, timbered ridges and creeks in farmland.		Assumed Present
Barking Owl <i>Ninox connivens</i>		Vulnerable		Description: is medium-sized owl (42 cm, 650 g), smaller than the similar Powerful Owl and larger than the Southern Boobook. It has bright yellow eyes and no facial-disc. Upperparts are brown or greyish-brown, and the white breast is vertically streaked with brown. The large talons are yellow. Habitat: inhabits woodland and open forest, including fragmented remnants and partly cleared farmland. It is flexible in its habitat use, and hunting can extend in to closed forest and more open areas. Habitat requirement (general): Hollow bearing trees, a living or dead tree with a hollow >20 cm diameter that occurs >4 metres above the ground.		Recorded - 1 individual within non- native vegetation

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Powerful Owl <i>Ninox strenua</i>		Vulnerable		Description: is a typical hawk-owl, with large yellow eyes and no facial-disc. Adults reach 60 cm in length, have a wingspan of up to 140 cm and weigh up to 1.45 kilograms. Males are larger than females. The upper parts of the Powerful Owl are dark, greyish-brown with indistinct off-white bars. The underparts are whitish with dark greyish-brown V-shaped markings. Habitat: inhabits a range of vegetation types, from woodland and open sclerophyll forest to tall open wet forest and rainforest. Habitat requirement (general): Hollow bearing trees, a living or dead tree with a hollow >20 cm diameter that occurs >4 metres above the ground.		Recorded - 1 individual within derived PCT 268
Gilbert's Whistler <i>Pachycephala inornata</i>		Vulnerable		Description: is a stocky whistler (17 to 20 centimetres), possessing a short but robust bill. The male is a brownish-grey, with a black patch between the red eyes and bill (the lores), and a distinctive orange-rufous chin and throat. The female is more uniformly brownish-grey, lacking the males lore and throat pattern and has a pale eye-ring. This species, particularly the female, can be difficult to distinguish from other whistlers. Habitat: occurs in a range of habitats within NSW, though the shared feature appears to be a dense shrub layer. It is widely recorded in mallee shrublands, but also occurs in box-ironbark woodlands,		Assumed Present

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Olive Whistler <i>Pachycephala olivacea</i>		Vulnerable		Description: is a small, stocky bird with a large head and strong sharp bill. It grows up to 22 cm long, including the 10 cm tail. It has a dark grey head, olive-brown upperparts, a grey throat and buff-brown underparts. The female is duller in colour than the male. Habitat: Mostly inhabit wet forests above about 500m. During the winter months they may move to lower altitudes.		Recorded
Scarlet Robin <i>Petroica boodang</i>		Vulnerable		Description: is a small robin that reaches 13 cm in length. The male has a black head and upperparts, with a conspicuous white forehead patch, white wing stripes and white tail-edges. The male has a bright scarlet-red chest and a white belly. The female is pale brown, darker above, and has a dull reddish breast and whitish throat. Habitat: lives in dry eucalypt forests and woodlands. The understorey is usually open and grassy with few scattered shrubs.		Assumed present

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Flame Robin <i>Petroica phoenicea</i>		Vulnerable		Description: a small Australian robin that reaches 14 cm in length. The male has a dark grey head and upperparts, a small white forehead patch, and white wing stripes and white tail-edges. The male has a bright orange-red throat, breast and upper-belly. The lower belly is white. The female is brown, darker above, and has a whitish throat and lower belly. Habitat: occurs mostly in in upland tall moist eucalypt forests and woodlands, often on ridges and slopes.		Recorded
Pink Robin <i>Petroica rodinogaster</i>		Vulnerable		Description: The male Pink Robin has a sooty black throat and upperparts. The wings have faint, tan-buff wing-bars. The breast and belly are deep lilac-pink, and there is a small white patch on the forehead. The female has warm olive-brown upperparts and cinnamon-buff underparts, a buff forehead spot, and may have a slight pink wash on the breast. Habitat: Inhabits rainforest and tall, open eucalypt forest, particularly in densely vegetated gullies.		Recorded

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Superb Parrot <i>Polytelis swainsonii</i>	Vulnerable	Vulnerable		Description: is a distinctive large, bright grass-green parrot with a long, narrow tail and sharply back-angled wings in flight. Males have yellow foreheads and throats and a red crescent that separates the throat from the green breast and belly. Females are slightly duller green and have a dull, light blue wash in place of the males' red and yellow markings. Habitat: Inhabit Box-Gum, Box-Cypress-pine and Boree woodlands and River Red Gum forest. Habitat requirement (breeding): Hollow bearing trees, - Living or dead Eucalypt (<i>E. blakelyi</i>, <i>E. melliodora</i>, <i>E. albens</i>, <i>E. camaldulensis</i>, <i>E. microcarpa</i>, <i>E. polyanthemos</i>, <i>E. mannifera</i>, <i>E. intertexta</i>, <i>E. bridgesiana</i>) with hollows greater than 5 cm diameter that are greater than 4 m above ground, or trees with a DBH of greater than 30 cm.		Recorded - 11 individuals within PCT 277 and 343
Grey-crowned Babbler <i>Pomatostomus temporalis temporalis</i>		Vulnerable		Description: reaching to 30 cm long. Its distinctive bill is scimitar-shaped, long and heavy. The broad white eyebrow and a pale grey crown-stripe are other distinguishing characters. A dark band passes from the bill through the eye, separating the pale throat and brow to giving a 'masked' look. It has dark greyish-brown upperparts and is paler brown on the underparts, grading to a whitish throat. It is distinctive in flight, showing white tips to the tail feathers, and orange-buff patches in the broad, rounded wings. Habitat: Inhabits open Box-Gum Woodlands on the slopes, and Box-Cypress-pine and open Box Woodlands on alluvial plains. Woodlands on fertile soils in coastal regions.		Recorded
Australian Painted Snipe <i>Rostratula australis</i>	Endangered	Endangered		Description: is small freshwater wader, with a long bill that droops slightly at the tip. The female has a chestnut-black hood with a bold white eye-patch and a cream stripe along the middle of the crown. The back and wings are patterned bronzy-greenish-grey with a few cream streaks and the underparts are white. The male is slightly smaller and has greyer, less contrasting patterns, but also has large cream spots on the wings. Habitat: resides in fringes of swamps, dams and nearby marshy areas where there is a cover of grasses, lignum, low scrub or open timber.		Assumed Present

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Diamond Firetail <i>Stagonopleura guttata</i>	Vulnerable	Vulnerable		Description: is a large (length 10 to 12 cm, weight 17 grams), striking finch with a bright red bill, and red eyes and rump. The white throat and lower breast are separated by a broad black breast-band that extends into the strongly white-spotted, black flanks. It has a grey back and head, and ashy-brown wings. Habitat: Found in grassy eucalypt woodlands, including Box-Gum Woodlands and Snow Gum <i>Eucalyptus pauciflora</i> Woodlands. Also occurs in open forest, mallee, Natural Temperate Grassland, and in secondary grassland derived from other communities. Often found in riparian areas (rivers and creeks), and sometimes in lightly wooded farmland.		Recorded
Freckled Duck <i>Stictonetta naevosa</i>		Vulnerable		Description: is a dark, greyish-brown bird with a large head that is peaked at the rear, and a distinctive narrow, slightly up-turned bill. Their dark brownish-black plumage is evenly freckled all over with white or buff. During the winter-spring breeding season, the male's bill becomes crimson at the base. Habitat: Prefer permanent freshwater swamps and creeks with heavy growth of Cumbungi, Lignum or Tea-tree. During drier times they move from ephemeral breeding swamps to more permanent waters such as lakes, reservoirs, farm dams and sewage ponds.		Assumed present

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Masked Owl <i>Tyto novaehollandiae</i>		Vulnerable		Description: A medium-sized owl to 40 - 50 cm long, with dark eyes set in a prominent flat, heart-shaped facial disc that is encircled by a dark border. The feet are large and powerful, with fully feathered legs down to the toes. The owl exists in several colour forms, with wide variation in plumage. The upperparts are grey to dark brown with buff to rufous mottling and fine, pale spots. The wings and tail are well barred. Habitat: Lives in dry eucalypt forests and woodlands from sea level to 1100 m, but often hunts along the edges of forests, including roadsides. Habitat requirement (general): Hollow bearing trees, a living or dead tree with a hollow >20 cm diameter that occurs >4 metres above the ground.		Assumed present
Sooty Owl <i>Tyto tenebricosa</i>		Vulnerable		Description: A medium-sized owl to 45 cm long, with dark eyes set in a prominent flat, heart-shaped facial disc. Dark sooty-grey in colour, with large eyes in a grey face, fine white spotting above and below, and a pale belly. Habitat: Occurs in rainforest, including dry rainforest, subtropical and warm temperate rainforest, as well as moist eucalypt forests. Habitat requirement (general): Escarpments, Caves, or Cliffs, including clifflines/ledges. Hollow bearing trees: a living or dead tree with a hollow >20 cm diameter that occurs > 4 metres above the ground.		Assumed present
Little Pied Bat <i>Chalinolobus picatus</i>		Vulnerable		Description: is a distinctive black and white bat that weighs four to eight grams. The head and body are about 4.5 cm in length; the tail 3.5 cm. The fur is glossy black on the back, grey on the belly, with white fur along the flanks forming a 'V' in the pubic area. Habitat: Occurs in dry open forest, open woodland, mulga woodlands, chenopod shrublands, cypress pine forest and mallee and Bimbil box woodlands.		Assumed present

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Large-eared Pied Bat <i>Chalinolobus dwyeri</i>	Vulnerable	Endangered		Description: A small to medium-sized bat with long, prominent ears and glossy black fur. The lower body has broad white fringes running under the wings and tail-membrane, meeting in a V-shape in the pubic area. This species is one of the wattled bats, with small lobes of skin between the ears and corner of the mouth. Habitat: Roosts in caves (near their entrances), crevices in cliffs, old mine workings and in the disused, bottle-shaped mud nests of the Fairy Martin (<i>Petrochelidon ariel</i>), frequenting low to mid-elevation dry open forest and woodland close to these features. Females have been recorded raising young in maternity roosts (c. 20-40 females) from November through to January in roof domes in caves, overhangs, mine adits and concrete structures such as derelict buildings. They remain loyal to the same cave over many years. Found in well-timbered areas containing gullies. Habitat requirement (general): Cliffs; Within two kilometres of rocky areas containing caves, overhangs, escarpments, outcrops, or crevices, or within two kilometres of old mines or tunnels.		Assumed present
Eastern False Pipistrelle <i>Falsistrellus tasmaniensis</i>		Vulnerable		Description: is relatively large with a head-body length of about 65 mm. It weighs up to 28 grams. It is dark to reddish-brown above and paler grey on its underside. It has long slender ears set well back on the head and some sparse hair on the nose. Habitat: Prefers moist habitats, with trees taller than 20 m. Generally roosts in eucalypt hollows, but has also been found under loose bark on trees or in buildings.		Recorded

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Large Bent-winged Bat <i>Miniopterus orianae oceanensis</i>		Vulnerable		Description: chocolate to reddish-brown fur on its back and slightly lighter coloured fur on its belly. It has a short snout and a high 'domed' head with short round ears. The wing membranes attach to the ankle, not to the base of the toe. The last bone of the third finger is much longer than the other finger-bones giving the "bent wing" appearance. It weighs up to 20 grams, has a head and body length of about 6 cm and a wingspan of 30 - 35 cm. Habitat: Caves are the primary roosting habitat, but also use derelict mines, storm-water tunnels, buildings and other man-made structures. Hunt in forested areas, catching moths and other flying insects above the tree tops. Habitat requirement (breeding): Caves or Cave, tunnel, mine, culvert or other structure known or suspected to be used for breeding including species records with microhabitat code "IC - in cave;" observation type code "E nest-roost;" with numbers of individuals >500.		Recorded - 136 passes within PCT 266, 277 and 278
Corben's Longeared Bat <i>Nyctophilus corbeni</i>	Vulnerable	Vulnerable		Description: has chocolate to reddish-brown fur on its back and slightly lighter coloured fur on its belly. It has a short snout and a high 'domed' head with short round ears. The wing membranes attach to the ankle, not to the base of the toe. The last bone of the third finger is much longer than the other finger-bones giving the "bent wing" appearance. It weighs up to 20 grams, has a head and body length of about 6 cm and a wingspan of 30 - 35 cm. Habitat: Caves are the primary roosting habitat, but also use derelict mines, storm-water tunnels, buildings and other man-made structures.		Assumed present

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Eastern Coastal Free- tailed Bat <i>Micronomus norfolkensis</i>	Vulnerable	-		Description: The Eastern Freetail-bat has dark brown to reddish brown fur on the back and is slightly paler below. Like other freetail-bats it has a long (3 - 4 cm) bare tail protruding from the tail membrane. Freetail-bats are also known as mastiff-bats, having hairless faces with wrinkled lips and triangular ears. They weigh up to 10 grams. Habitat: Occurs in dry sclerophyll forest, woodland, swamp forest and mangrove forests east of the Great Dividing Range. Roosts mainly in tree hollows but will roost also under bark or man-made structures.		Assumed present
Yellow-bellied Sheathtail -bat <i>Saccolaimus flaviventris</i>		Vulnerable		Description: is a very distinctive, large, insectivorous bat up to 87 mm long. It has long, narrow wings, a glossy, jet-black back, and a white to yellow belly extending to the shoulders and just behind the ear. Characteristically, it has a flattened head and a sharply-pointed muzzle. The tail is covered with an extremely elastic sheath that allows variation in the tail-membrane area. Habitat: utilises most habitats across its very wide range, with and without trees.		Assumed present
Greater Broad-nosed Bat <i>Scoteanax rueppellii</i>		Vulnerable		Description: is a large powerful bat, up to 95 mm long, with a broad head and a short square muzzle. It is dark reddish-brown to mid-brown above and slightly paler below. It is distinguished from other broad-nosed bats by its greater size. Habitat: Utilises a variety of habitats from woodland through to moist and dry eucalypt forest and rainforest, though it is most commonly found in tall wet forest.		Recorded

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Southern Myotis <i>Myotis macropus</i>		Vulnerable		Description: It has disproportionately large feet; more than 8 mm long, with widely-spaced toes which are distinctly hairy and with long, curved claws. It has dark-grey to reddish brown fur above and is paler below. It weighs up to 15 grams and has a wingspan of about 28 cm. Habitat: Generally roost in groups of 10 - 15 close to water in caves, mine shafts, hollow-bearing trees, storm water channels, buildings, wharves, bridges and in dense foliage. General habitat constraint: Waterbodies: waterbodies with permanent pools/stretches 3m or wider, including rivers, large creeks, billabongs, lagoons, estuaries, dams and other waterbodies, on or within 200 m of the site.		Recorded - 127 passes within PCT 266, 268, 277 and 278
Spotted-tailed Quoll <i>Dasyurus maculatus</i>	Endangered	Vulnerable		Description: is about the size of a domestic cat, from which it differs most obviously in its shorter legs and pointed face. The average weight of an adult male is about 3500 grams and an adult female about 2000 grams. It has rich-rust to dark-brown fur above, with irregular white spots on the back and tail, and a pale belly. Habitat: Recorded across a range of habitat types, including rainforest, open forest, woodland, coastal heath and inland riparian forest, from the sub-alpine zone to the coastline.		Assumed present
Koala <i>Phascolarctos cinereus</i>	Endangered	Endangered		Description: an arboreal marsupial with fur ranging from grey to brown above, and white below. It has large furry ears, a prominent black nose and no tail. It spends most of its time in trees and has long, sharp claws, adapted for climbing. Adult males weigh 6 - 12 kg and adult females weigh 5 - 8 kg. Habitat: Inhabit eucalypt woodlands and forests. Habitat requirement (general): Presence of koala use trees.		Assumed present

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Yellow-bellied Glider <i>Petaurus australis</i>	Vulnerable	Vulnerable		Description: is a large, active, sociable and vocal glider. Adults weigh 450 - 700 grams, have a head and body length of about 30 cm and a large bushy tail that is about 45 cm long. It has grey to brown fur above with a cream to yellow belly, which is paler in young animals. Habitat: Occur in tall mature eucalypt forest generally in areas with high rainfall and nutrient rich soils.		Recorded - 10 individuals within PCT 638, 679, 953 and non-native vegetation
Greater Glider <i>Petauroides volans</i>	Endangered	Endangered		Description: the largest gliding possum in eastern Australia. It has a weight range of 900-1700 g. Females are larger than males. It has a head and body length of 350-450mm and a long furry tail measuring 450-600mm. Fur colour is white or cream below and varies from dark grey, dusky brown through to light mottled grey and cream above. It has large ears with hair that projects past the outer ear edge. It has strongly reflective eyeshine in the beam of a spotlight making it easy to detect. Habitat: Feeds exclusively on eucalypt leaves, buds, flowers and mistletoe. Shelters during the day in tree hollows and will use up to 18 hollows in their home range.		Recorded - 18 individuals within PCT 300 and non-native vegetation & 14 individuals within PCT 300, 638, 953 and non-native vegetation

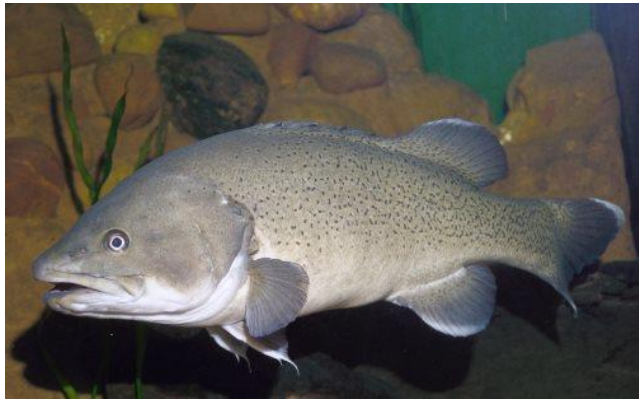
Common Name <i>Scientific name</i>	EPBC Act Status	BC Act Status	FM Act Status	Identification. Source: Australian Museum, 2022; DPI, 2025; DCCEEW – NSW, 2025a; DCCEEW – NSW, 2025b; DCCEEW - NSW, 2025c	Photo. Source: Birdlife Australia, 2022; EBIRD, 2025; DPI, 2025; DCCEEW – NSW, 2025c	Status within HLW
Squirrel Glider <i>Petaurus norfolcensis</i>		Vulnerable		Description: have a head and body length of about 20 cm. They have blue-grey to brown-grey fur above, white on the belly and the end third of the tail is black. There is a dark stripe from between the eyes to the mid-back and the tail is soft and bushy averaging about 27 cm in length. Habitat: inhabits mature or old growth Box, Box-Ironbark woodlands and River Red Gum forest west of the Great Dividing Range and Blackbutt-Bloodwood forest with heath understorey in coastal areas.		Recorded - 2 individuals within PCT 268 and 277 & 1 individual within PCT 1196
Eastern Pygmy Possum <i>Cercartetus nanus</i>		Vulnerable		Description: are tiny (15 to 43 grams) active climbers, with almost bare, prehensile (capable of curling and gripping) tails, and big, forward-pointing ears. They are light-brown above and white below. Adults have a head and body length between 70 - 110 mm and a tail length between 75 - 105 mm. Habitat: Found in a broad range of habitats from rainforest through sclerophyll (including Box-Ironbark) forest and woodland to heath, but in most areas woodlands and heath appear to be preferred, except in north-eastern NSW where they are most frequently encountered in rainforest.		Recorded - 17 individuals within PCT 638, 953 and 1196
Leadbeater's Possum <i>Gymnobelideus leadbeateri</i>	Critically Endangered	Previously listed as extinct – status currently under review		Description: are a small, fast-moving marsupial weighing around 100–160 grams, with a grey-brown body, pale underparts, large dark eyes, and prominent rounded ears. Adults have a body length of about 15–17.5 cm and a distinctive black-tipped tail that adds another 18–20 cm, giving them a sleek, agile appearance suited for life in the treetops. Habitat: inhabits wet eucalypt forests, particularly those dominated by Mountain Ash and Alpine Ash trees. It relies on areas with numerous large, old trees that contain hollows for shelter, and a dense understorey of wattles that provide food and cover. Long thought extinct in New South Wales and known only from small, fragmented populations in Victoria's Central Highlands, more recently in 2025 a population was rediscovered near Yarrangobilly Caves in Kosciuszko National Park, expanding its known range.		N/A – discovered at Yarrangobilly in Kosciuszko National Park

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New Holland Mouse <i>Pseudomys novaehollandiae</i>	Vulnerable			Description: A small native rodent with pale grey-brown dorsal fur, light grey underparts and pale feet. The tail is longer than the head-body length and is dusky brown on top, whitish below and darker at the tip. Habitat: Open heathlands, woodlands and dry sclerophyll forests with a heath understorey, grasslands and vegetated sand dunes.		Assumed present
Smoky Mouse <i>Pseudomys fumeus</i>	Endangered	Critically Endangered		Description: is a similar in size to a small rat, with a head and body length averaging about 90 mm and a tail averaging 140 mm. The average adult weight is 52 grams (ranging between 38 - 68 grams). The fur is fine, soft, pale-grey to bluish-grey above, with a grey to white belly and a ring of dark hairs around the eye. The tail is long, narrow and sparsely furred, mostly pale to pinkish, with a narrow, dark stripe along the upper surface. Habitat: tends to prefer heath habitat on ridge tops and slopes in sclerophyll forest, heathland and open-forest from the coast (in Victoria) to sub-alpine regions of up to 1800 metres, but sometimes occurs in ferny gullies.		Assumed present
Broad-toothed Rat <i>Mastacomys fuscus</i>	Vulnerable	Vulnerable		Description: A compact rodent, chubby-cheeked, with a short, wide face and ears, and long, dense, fine fur. It is brown above, with attractive, rufous highlights. Habitat: lives in a complex of runways through the dense vegetation of its wet grass, sedge or heath environment.		Assumed present

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Brush-tailed Phascogale <i>Phascogale tapoatafa</i>		Vulnerable		Description: is tree-dwelling marsupial carnivore. It has a characteristic, black, bushy 'bottlebrush' tail, with hairs up to 4 cm long. Its fur is grey above and pale cream below and it has conspicuous black eyes and large naked ears. Adults have a head and body length of about 20 cm, a tail length of about 20 cm and weigh 110 - 235 grams. Habitat: Prefer dry sclerophyll open forest with sparse groundcover of herbs, grasses, shrubs or leaf litter.		Assumed present
Pink-tailed Legless Lizard <i>Aprasia parapulchella</i>	Vulnerable	Vulnerable		Description: worm-like, with a dark-brown head and nape, gradually merging with the pale grey or grey-brown body. The tail, nearly as long as its body, is pink or reddish-brown towards the tip. Its snout and tail are both rounded. There are no external ear openings. Specimens grow to about 25cm in length. Habitat: Inhabits sloping, open woodland areas with predominantly native grassy groundlayers, particularly those dominated by Kangaroo Grass (<i>Themeda australis</i>). Habitat requirement (general): Rocky areas, or within 50 m of rocky areas.		Recorded
Striped Legless Lizard <i>Delma impar</i>	Vulnerable	Vulnerable		Description: It is pale grey-brown above, with a darker head, and almost white below. The most distinguishing characteristic is a pattern of light and dark parallel lines running along the length of the body, although these may be very pale or even absent in some individuals. This parallel stripe pattern breaks up into a diagonal pattern on the tail. They grow to about 30 cm in length, with up to three-quarters of this being the tail. Habitat: Found mainly in Natural Temperate Grassland but has also been captured in grasslands that have a high exotic component.		Recorded

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Alpine She-oak Skink <i>Cyclodomorphus praealtus</i>	Endangered	Endangered		Description: is a slender medium-sized lizard reaching a maximum length of around 350 mm, with a snout to vent length up to 130 mm. Above, it is olive-green to reddish-brown and has smooth, overlapping scales with dark lateral edges that create a series of thin, longitudinal dark lines. Scales may have black and grey flecks. Habitat: have specific habitat requirements, preferring tree-less or very lightly treed areas that contain tussock grasses, low heath or a combination of both. Within this habitat the species shelters beneath litter, rocks, logs and other ground debris, and has been observed basking on grass tussocks.		Recorded
Rosenberg's Goanna <i>Varanus rosenbergi</i>		Vulnerable		Description: Rosenberg's Goanna grows up to 1.5m long. It's dark grey with fine yellow or white spots and paired black bands from neck to tail. Its tail has narrow regular bands – a key feature that sets it apart from the Lace Monitor, which has broader tail bands. Rosenberg's Goanna also has finely barred lips and a pale-edged black stripe from eye to neck. Juveniles are brighter, with an orange tint on the face and body. Habitat: It is commonly associated with heath, open forest and woodland. Habitat requirements (breeding):relays on large areas of habitat with access to termite mounds for nesting, hollow logs, rock crevices or burrows for shelter.		Assumed present
Broad-headed Snake <i>Hoplocephalus bungaroides</i>	Vulnerable	Endangered		Description: The Broad-headed Snake is black above with numerous bright yellow scales forming a series of irregular, narrow cross-bands. The belly is grey to grey-black, sometimes with yellow blotches. The head also has yellow blotches and the labials are barred yellow. It grows to a maximum length of 90 cm, however its average length is 60 cm. Habitat: Most commonly found in rocky outcrops and adjacent sclerophyll forest and woodland. Most suitable sites occur in sandstone ridgetops. Habitat requirement (breeding): Rocky areas; including escarpments, outcrops and pagodas within the Sydney Sandstone geologies.		

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Sloane's Froglet <i>Crinia sloanei</i>	Endangered	Endangered		Description: is a small ground-dwelling frog belonging to the family Myobatrachidae Shows far less variation in back colour pattern than other <i>Crinia</i> species, having a mustard yellow or greyish back with large patches of darker pigment over the body. The throat of males is greyish green. The call is described as a short metallic 'chick chick chick chick' repeated frequently. Habitat: It is typically associated with periodically inundated areas in grassland, woodland and disturbed habitats. Habitat requirement (general): Semi-permanent/ephemeral wet areas; Containing relatively shallow sections with submergent and emergent vegetation, or within 500 m of wet area; Swamps; Within 500 m of swamps; Waterbodies; Within 500 m of waterbody.		Assumed present
Yellow-spotted Tree Frog <i>Litoria castanea</i>	Critically Endangered	Critically Endangered		Description: are large, long-lived and mostly aquatic tree frogs, with only small finger and toe pads. Can be distinguished from other members of the group by its fully webbed toes and yellow spots on the groin and the back of the thighs. Elsewhere it is marbled green and gold, with black spots. This patterning varies greatly, but the pale green mid-back stripe is unvarying. The larger females may be up 9cm long. Habitat: Require large permanent ponds or slow flowing 'chain-of-ponds' streams with abundant emergent vegetation such as bulrushes and aquatic vegetation.		Assumed present
Booroolong Frog <i>Litoria booroolongensis</i>	Endangered	Endangered		Description: is a medium sized tree frog, with adults growing to about 5 cm. Their body-colour may be grey, olive or brown with indistinct black markings. The abdomen is white. The skin usually has a slightly warty appearance. The fingers and toes have well developed discs, and the toes are strongly webbed. Habitat: Live along permanent streams with some fringing vegetation cover such as ferns, sedges or grasses.		Assumed present

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Silver Perch <i>Bidyanus bidyanus</i>			Vulnerable	Description: The Silver Perch is a moderate to large, oval-shaped freshwater fish. Distinguishing features include: Small head and mouth; Grey to green in colour, sometimes gold or silvery, darker on the back and paler on the sides. Juveniles may be mottled with vertical dark bar; A single dorsal fin; White belly; and slightly forked tail. Habitat: Silver Perch have been found in a wide range of habitats and climates across the Murray-Darling Basin. They are generally found in faster-flowing water including rapids and races and more open sections of river. Spawning and recruitment success are both considered to be heavily dependent on high flows and overbank flooding. General habitat requirement: Fallen/standing dead timber including logs		Assumed present
Flatheaded Galaxias <i>Galaxias rostratus</i>			Critically Endangered	Description: The Flathead Galaxias is distinguished by: Flattened head; Large mouth with equal-sized jaws; Light olive green body with light mottling; Very small transparent pectoral and pelvic fins; and dorsal fin origin always slightly in front of anal fin. Habitat: found in still or slow moving water bodies such as wetlands and lowland streams. The species has been recorded forming shoals. They have been associated with a range of habitats including rock and sandy bottoms and aquatic vegetation. Flathead Galaxias spawn in spring and lay slightly adhesive demersal eggs.		Assumed present
Trout Cod <i>Maccullochella macquariensis</i>			Endangered	Description: Trout Cod can grow to 85 cm in length and 16 kg in weight, but more commonly occur up to 50 cm and 1.5 kg. They are mostly olive in colour but can range from blue-grey to dark brown on the back with a speckled pattern of dark grey to black spots. The underside is generally paler in colour ranging from grey to white. Habitat: Trout Cod are often found in faster flowing water with rocky and gravel bottoms, but can also be found in some slower flowing, lowland rivers. Large woody snags are very important for the species as they provide complex habitats for each stage of the species' life cycle.		Assumed Present

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Macquarie Perch <i>Macquaria australasica</i>			Endangered	Description: elongated, oval shaped fish. They are distinguished by: Large eyes; Pores on the snout and around the eye; Jaws of equal size; Large distinct scales along the body; Rounded tail. They can be black, silver-grey, blue-grey or green-brown in colour, with a paler underside. Macquarie Perch from coastal catchments are blotched with grey-brown, buff and dark grey patches over the head and body. Habitat: Macquarie Perch occur in waters with lots of cover such as aquatic vegetation, snags, boulders and overhanging banks.		Assumed Present
Southern Pygmy Perch <i>Nannoperca australis</i>			Endangered	Description: The Southern Pygmy Perch is distinguished by: Small mouth reaching to just below the eye; Colour is variable but base colour ranges from pale-cream to green-brown, paler on the belly with dark blotches along the body; Breeding males display brighter colours with dorsal and anal fins becoming bright red with black edges; A single, deeply notched dorsal fin; and squarish to slightly-rounded tail. Habitat: They are often found in small systems with a low flow rate and quiet vegetated areas in streams, billabongs, lakes. They prefer covered habitats and are not usually found in open water.		
Murray Crayfish <i>Euastacus armatus</i>			Vulnerable	Description: Murray Crayfish have characteristic white claws and three rows of large white spines on each side of the tail. Males generally have larger claws while females have broader abdomens. Individuals have a dark green to green-brown body. The species grows to more than 150 mm in carapace length; with the maximum recorded size being 174 mm and 2.5 kg. Habitat: Murray Crayfish prefer cool, flowing water that is well oxygenated. The species is tolerant of water temperatures up to 27°C and moderate salinities, but are intolerant to low dissolved oxygen concentrations. They create burrows that vary in complexity, from deep burrows with multiple entrances to simple burrows under a rock or log.		Assumed present

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Key's Matchstick Grasshopper <i>Keyacris scurra</i>	Endangered	Endangered		Description: Key's Matchstick Grasshopper is a small (females ~25 mm, males ~18mm), slender, wingless grasshopper characterised by its slanted face, splayed hind femora (longest segment of the hind leg) and sword-shaped antennae. This species occurs in several colour forms, with brown being the most common. Habitat: Typically found in native grasslands and grassy woodlands but it has also been recorded in other vegetation associations usually containing a native grass understory (especially kangaroo grass <i>Themeda triandra</i>) and known food plants (particularly Asteraceae).		Recorded
Golden Sun Moth <i>Synemon plana</i>	Vulnerable	Vulnerable		Description: medium-sized, day-flying (diurnal) moth. Females have a wing-span of 31 mm; the male's wingspan is 34 mm. The female has a reduced hind-wing and is a very poor flyer. The female's upper side of the fore-wing is dark grey, patterned with paler grey, and the hindwing is bright orange with black spots near the edge. The undersides of both wings is white with small black spots near the edges. The male's upper side of the fore-wing is dark brown, patterned with pale grey, and the hind-wing is bronzy-brown with dark brown patches. The undersides of both wings is pale grey with dark brown spots. Both males and females have clubbed antennae. Functional mouthparts are lacking in both sexes. The immature stages have not been described. Habitat: Occurs in Natural Temperate Grasslands and grassy Box-Gum Woodlands in which ground layer is dominated by wallaby grasses <i>Austrodanthonia</i> spp. Grasslands dominated by wallaby grasses are typically low and open - the bare ground between the tussocks is thought to be an important microhabitat feature for the Golden Sun Moth, as it is typically these areas on which the females are observed displaying to attract males. Habitat may contain several wallaby grass species, which are typically associated with other grasses particularly spear-grasses <i>Austrostipa</i> spp. or Kangaroo Grass <i>Themeda triandra</i>.		Identified – expert report

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Ausfeld's Wattle <i>Acacia ausfeldii</i>		Vulnerable		Description: is an erect or spreading shrub 2 - 4 m high with branchlets angled or flattened, resinous and smooth. The phyllodes (leaves) are narrowly elliptic to linear-oblong, straight to slightly curved, 2 - 7 cm long, 2 - 5 mm wide, hairless and are dotted with resin glands. <i>Acacia ausfeldii</i> phyllodes have a prominent mid-vein and less pronounced lateral veins, they also have an obtuse apex with a short sharp tip. Habitat: Grows in eucalypt woodland in sandy soil; often in remnant roadside patches of woodland. Flowering: from August to October. Habitat requirement (general): Foot slopes and low rises on sandstone.		Recorded
Yass Daisy <i>Ammobium craspedioides</i>	Vulnerable	Vulnerable		Description: is a rosette-forming perennial. Leaves are spoon-shaped, to 12 cm long and 17 mm wide, hairy on top and white and woolly underneath. The spring flowerheads are hemispherical buttons, to 20 mm wide, and surrounded at the base by papery leaf-like structures. Habitat: Found in moist or dry forest communities, Box-Gum Woodland and secondary grassland derived from clearing of these communities.		Recorded

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<i>Bossiaea fragrans</i>	Critically Endangered	Critically Endangered		Description: An erect shrub that grows to 1-2.5m high. It has characteristic flattened stems with reduced leaves known as cladodes that are glaucous green and range from 8-14mm wide. Leaf scales are present and ranging from 1.5-1.9mm long. The flowers are yellow with red markings. Habitat: Occurs on spilite, rhyolite or slate and volcanic substrates and is often associated with Red Stringybark (<i>Eucalyptus macrorhyncha</i>) - Red Box (<i>Eucalyptus polyanthemos</i>) woodland +/- White Box (<i>Eucalyptus albens</i>). Flowering: from September through to October.		Recorded
Small Pale Grass-lily <i>Caesia parviflora</i> var. <i>minor</i>		Endangered		Description: The leaves are 2 mm wide and arranged in a rosette at ground level. Several multi-branched flowering shoots spread widely and turn up at the ends. The whole plant is usually much less than 20 cm tall. The small, white starry flowers may be tinged with blue or purple. Habitat: Found in damp places in open forest on wet heathland on sandstone and sand.		Recorded

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Crimson Spider Orchid <i>Caladenia concolor</i>	Vulnerable	Endangered		Description: has a single leaf up to 15 cm long. The flower stem is up to 30 cm tall with 1 or 2 deep purplish-red flowers, 80 mm across. The flowers are said to smell strongly like a hot motor. Habitat: is regrowth woodland on granite ridge country that has retained a high diversity of plant species, including other orchids. Flowering: generally, occurs in September.		Assumed present
<i>Caladenia montana</i>		Vulnerable		Description: terrestrial orchid with a leaf 80–120 mm long and 8–12 mm wide. The flower stem is 100–250 mm tall, with one flower which is 40–60 mm across, greenish cream or cream, sometimes with reddish markings. The sepals have thickened club-like tips that are dark red or brownish and 8–15 mm long. The labellum is 10–12 mm long by 7–9 mm wide, mostly maroon, with a paler base and margins with 6–8 pairs of red teeth to 1.5 mm long. Habitat: restricted to high montane areas 700–1000 m a.s.l. where it grows in well-drained loam on slopes and ridges of montane forest among an understorey of shrubs. Flowering: from October to January.		Assumed present
Mauve Burr-daisy <i>Calotis glandulosa</i>	Vulnerable	Vulnerable		Description: is a sprawling, branched herb that grows to 20 cm tall and up to 1 m wide. The soft, bright green, hairy leaves have indented edges. They are up to 3 cm long and 9 mm wide. The 2 cm wide flower-heads are solitary, mauve, and have a yellow centre. Flowers may also be white, blue or pink. Habitat: found in montane and subalpine grasslands in the Australian Alps. Flowering: spring and summer.		Assumed present

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Max Mueller's Burrdaisy <i>Calotis pubescens</i>		Endangered		Description: is a perennial herb with thick and fleshy underground stems (rhizomes) and forms large mats. Its leaves are very woolly when young. It has unbranched flowering stems that hold single mauve or white flower-heads. Habitat: Grows in subalpine treeless plains in herb-rich grassland often dominated by <i>Poa hookeri</i>. Flowering: occurs in December		Recorded
Small Scurf-pea <i>Cullen parvum</i>		Endangered		Description: is a small perennial pea that may either trail or stand erect. Its leaves comprise three elongated leaflets to 25 mm long by 8 mm wide. Its flowers are usually also in threes, purple-pink (or sometimes white). Habitat: found in grassland, River Red Gum (<i>Eucalyptus camaldulensis</i>) Woodland or Box-Gum Woodland, sometimes on grazed land and usually on table drains or adjacent to drainage lines or watercourses, in areas with rainfall of between 450 and 700 mm. Flowering: occurs in Summer.		Recorded
Pine Donkey Orchid <i>Diuris tricolor</i>		Vulnerable		Description: is a terrestrial species (it grows from the ground rather than from rocks or vegetation). It has between one and three leaves, to 30 centimetres long and 4 mm wide. The flower stalk is between 20-40 cm high and has 2-6 flowers, which are bright yellow to orange, speckled with red to purple and white markings. Habitat: grows in sclerophyll forest among grass, often with native Cypress Pine (<i>Callitris</i> spp.). It is found in sandy soils, either on flats or small rises. Flowering: usually flowers between early September to late October.		Recorded

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Rough Eyebright <i>Euphrasia scabra</i>		Endangered		Description: is a semi-parasitic, annual herb, growing to about 0.5 m tall. The stems branch just below the flower-clusters (inflorescence). The leaves are variable on individual plants; those closer to the inflorescences tend to be narrower and have more teeth. Habitat: Occurs in or at the margins of swampy grassland or in sphagnum bogs, often in wet, peaty soil. Flowering: between January and April. Habitat requirement (general): Montane bogs or within 50 m.		Assumed present
Clover Glycine <i>Glycine latrobeana</i>	Vulnerable	Critically Endangered		Description: is a low-growing herb growing to only a few cm high. Leaves are split into three, like a classic clover leaf, 5–20 mm long and 4–12 mm wide. The species generally flowers in spring in the lower elevation parts of its range and in summer in higher elevation areas. Habitat: mainly in grassland and grassy woodland habitats, less often in dry forests, and only rarely in heathland.		Recorded

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Tumut Grevillea <i>Grevillea wilkinsonii</i>	Endangered	Critically Endangered		Description: typically grows to a large spreading shrub up to 2.5 m tall and 2 m wide. The leaves are more or less oblong, to 15 cm long by 2 cm wide, with scalloped edges; each scallop is separated by a small sharp tooth. The leaves are green (sometimes bronze on young foliage) and almost hairless on the upper surface; the lower surface has a silky covering of short silvery-grey hairs. The individual flowers are small and distinctive, with pinkish to purple petals and a lilac-pink, green or yellow tipped style. The flowers form toothbrush-like clusters that are usually 3 - 5 cm long. Habitat: the species generally grows in close proximity to the water, at altitudes between 310 and 340 m. Most healthy adult plants occur in open sunny areas, and those plants found under the canopy of dense vegetation tend to be spindly and are sometimes subject to sooty mould infestations.		Recorded
Hoary Sunray <i>Leucochrysum albicans</i> var. <i>tricolor</i>	Endangered	Endangered		Description: A perennial everlasting daisy. Stems are 10–15 cm tall, with narrow leaves 2–10 cm long, covered in white cottony hairs. Yellowish flowerheads are 2–5 cm in diameter, surrounded by numerous papery, white, overlapping ovate-oblong bracts, with the outer layers tinged red, pink, purple or brown. Fruits are brown, ovoid, 2–3 mm long, with 14–20 pappus bristles. Habitat: a wide variety of grassland, woodland and forest habitats, generally on relatively heavy soils. Flowering: August to March		Recorded
Clandulla Geebung <i>Persoonia marginata</i>	Vulnerable	Vulnerable		Description: A spreading shrub that grows to 50 cm high and up to 1 m across. Young branches are hairy. Leaves are elliptic to obovate, 2–4 cm long and 6–23 mm wide, sparsely hairy when young and hairless when mature. Flowers are yellow with brownish hairs; have a densely hairy ovary; and occur on short stalks 2–7 mm long. Habitat: Grows in dry sclerophyll forest and woodland communities on sandstone. Flowering: Winter.		Assumed Present

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<i>Pimelea bracteata</i>	Critically Endangered	Critically Endangered		Description: shrub to 2 m tall, with hairless stems. Leaves are 6–10 mm long and 3–6 mm wide, often with a purplish tinge. Flowers are in nodding bracteate heads that grow on short side branches. The large bracts (6–8, 10–18 mm long) completely surrounding the cluster of pale yellow flowers and are hairless, yellow-green often tinged with purple or red. There are between 15–26 flowers 15–26 in each head, 12–17 mm long. Fruit are 3–4.5 mm long and green. Habitat: occurs in wetlands and along waterways and stream edges in high altitude treeless subalpine valleys. It can also occur in wet heathland and closed heath. Flowering: early to mid-summer.		Recorded – approximately 1,502 individuals recorded within PCT 679 and 953
Cotoneaster Pomaderris <i>Pomaderris cotoneaster</i>	Critically Endangered	Critically Endangered		Description: Cotoneaster Pomaderris is a shrub growing to 4 m tall. Its young stems have a covering of short, white, star-shaped hairs. Its leaves are elliptical, to 30 mm long and 15 mm wide with a tip that is sometimes indented (thus resembling the horticultural Cotoneaster, to which it is not related). The upper surface of the leaf is bristly and the lower surface has a fine white mat of star-shaped hairs. Its petal-less flowers are cream-coloured. Flowering occurs between October and November. Habitat: Cotoneaster Pomaderris has been recorded in a range of habitats in predominantly forested country. The habitats include forest with deep, friable soil, amongst rock beside a creek, on rocky forested slopes and in steep gullies between sandstone cliffs.		Assumed present

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Bago Leek-orchid <i>Prasophyllum bagoense</i>	Critically Endangered	Critically Endangered		Description: It is a tuberous ground orchid that grows singly or in loose groups. Plants have a single, erect, tubular leaf, 20 to 35 cm long and 3 to 4 mm wide. The flower spike is 5 to 9 cm long and bears 15 to 30 flowers that are densely arranged up the spike. The flowers are 8 to 11 mm across and pale tawny-green. Habitat: Found in grassy, low heathland dominated by <i>Poa clivicola</i> , <i>Epacris gunnii</i> and <i>E. celata</i> on a subalpine plain bordered by Snow Gum and Mountain Gum.		Recorded
Brandy Marys Leek-orchid <i>Prasophyllum innubum</i>	Critically Endangered	Critically Endangered		Description: It has a single erect bright green tubular leaf 20-50 cm long (7-15 cm of it free above the point of attachment of the inflorescence stalk) and 3-4 mm wide, often withering at the tip in flowering stage. The inflorescence is a loose spike 5-8 cm long, with 6-20 subsessile flowers, each 6-9 mm across and brownish green with white and purplish petals and a white or pink labellum. Habitat: The species is known only from a highly restricted streamside habitat and <i>Sphagnum</i> hummocks, and rarely on adjacent grassy flats, at altitudes of 1150-1180 m. Flowering: occurs between January and February.		Recorded

Common Name <i>Scientific name</i>	EPBC Act Status	BC Act Status	FM Act Status	Identification. Source: Australian Museum, 2022; DPI, 2025; DCCEEW – NSW, 2025a; DCCEEW – NSW, 2025b; DCCEEW - NSW, 2025c	Photo. Source: Birdlife Australia, 2022; EBIRD, 2025; DPI, 2025; DCCEEW – NSW, 2025c	Status within HLW
Kelton's Leek Orchid <i>Prasophyllum keltonii</i>	Critically Endangered	Critically Endangered		Description: is a terrestrial orchid with a single erect bright green tubular leaf 20 to 35 cm long and 3 to 5 mm wide, often withering at the tip in flowering stage. 8 to 15 cm of the leaf is free above the point of attachment of the inflorescence (flower spike). The flower colour is green or brownish-red or purplish with green tinges. Habitat: has a preference for moderately boggy ground, though not sphagnum-dominated areas, but also occurs on some drier patches.		Recorded
Tarengo Leek Orchid <i>Prasophyllum petilum</i>	Endangered	Endangered		Description: Each plant produces a solitary, tubular, fleshy, dull green leaf, growing to 35 cm tall. The flower-stem emerges in mid spring to early summer from a hole near the base of the leaf. The raceme, reaching to 12 cm tall, has about 20 fragrant flowers with pointed tepals. The flowers are usually a pale whitish-green but can be pink or pale purple. Habitat: Grows in open sites within Natural Temperate Grassland at the Boorowa and Delegate sites. Flowering: occurs between September and December.		Recorded

Common Name <i>Scientific name</i>	EPBC Act Status	BC Act Status	FM Act Status	Identification. Source: Australian Museum, 2022; DPI, 2025; DCCEEW – NSW, 2025a; DCCEEW – NSW, 2025b; DCCEEW - NSW, 2025c	Photo. Source: Birdlife Australia, 2022; EBIRD, 2025; DPI, 2025; DCCEEW – NSW, 2025c	Status within HLW
Alpine Greenhood <i>Pterostylis alpina</i>		Vulnerable		Description: There is a rosette of 3-5 basal leaves, ovate to obovate, 2–6 cm long, 10–15 mm wide. The flowering stem is rough and to 30 cm tall. The flower is about 3 cm long, erect, dark green and white. Habitat: is often found on sheltered southern slopes near streams in rich loam. Flowering: from August to October.		Recorded
Slender Greenhood <i>Pterostylis foliata</i>		Vulnerable		Description: with 3-6 roughly ovate leaves 2–5 cm long, 8–16 mm wide. The flowering stem is up to 30 cm high and is smooth. The flower is about 2 cm long, dark green and white with brown in the galea. Habitat: grows in eucalypt forest amongst an understorey of shrubs, ferns and grasses. It grows on loam or clay loam soils found on sheltered sloping to steep ground and populations may be found in localised open seepage areas. Flowering: occurs from August to January.		Recorded

Common Name <i>Scientific name</i>	EPBC Act Status	BC Act Status	FM Act Status	Identification. Source: Australian Museum, 2022; DPI, 2025; DCCEEW – NSW, 2025a; DCCEEW – NSW, 2025b; DCCEEW - NSW, 2025c	Photo. Source: Birdlife Australia, 2022; EBIRD, 2025; DPI, 2025; DCCEEW – NSW, 2025c	Status within HLW
Blue-tongued Greenhood <i>Pterostylis oreophila</i>	Critically Endangered	Critically Endangered		Description: to five leaves in a basal rosette before flowering. The leaves are later arranged loosely along the 20 cm tall flowering stems. The leaves are oval in shape, to 70 mm long and 20 mm wide. The flower is solitary, erect, predominantly white with narrow green stripes, somewhat bulky (the hood-like structure being about 2.5 cm long). Habitat: Grows along sub-alpine watercourses under more open thickets of Mountain Tea-tree in muddy ground very close to water. Flowering: occurs from November to January.		Recorded
Dwarf Bush-pea <i>Pultenaea humilis</i>		Vulnerable		Description: is an erect to prostrate shrub, 0.2–0.8 m high with branchlets erect or drooping that are sparsely to moderately hairy. The leaves are alternate, 3.9–12.5 by 1–2.5 mm, flat, straight, smooth, leathery and light green. Leaves are sparsely hairy or may be hair free. Habitat: found in isolated remnants of native woodland and forest communities that occur in extensively cleared agricultural landscapes. Flowering: occurs from October to December.		Recorded

Common Name <i>Scientific name</i>	EPBC Act Status	BC Act Status	FM Act Status	Identification. Source: Australian Museum, 2022; DPI, 2025; DCCEEW – NSW, 2025a; DCCEEW – NSW, 2025b; DCCEEW - NSW, 2025c	Photo. Source: Birdlife Australia, 2022; EBIRD, 2025; DPI, 2025; DCCEEW – NSW, 2025c	Status within HLW
Monaro Golden Daisy <i>Rutidosia leiolepis</i>	Vulnerable	Vulnerable		Description: is a low, tufted perennial with a woody root-stock. Leaves are dark green, woolly underneath, to about 10 cm long and 3 mm wide. The solitary, slightly domed flower-heads are 15 mm across, and occur on numerous 25 cm tall woolly stems. The stems bear a few small leaves. Flower-heads are conspicuous and bright yellow, and surrounded by pale brown, translucent, papery bracts. Habitat: Natural Temperate Grassland on the Monaro and occurs in sub-alpine grasslands in Kosciuszko National Park. Flowering: usually occurs December to February.		Recorded
Perisher Wallaby-Grass <i>Rytidosperma vickeryae</i>	Endangered			Description: is a small perennial grass to 0.3 m high, with tufts of leaves at intervals along a rhizome; the leaves have the ligule reduced to a ciliate rim of hairs c. 0.3 mm long, with longer hairs at the sides; the leaf blade becomes folded, c. 2 mm wide, mostly smooth; the panicle is exserted, 3-4 cm long, open, loose, with fine branches, the spikelets clustered at the ends; spikelets are 2-4-flowered, long-pedicellate, 5-7 mm long, the florets consistently longer than the glumes; the glumes are subequal, 3.8-4.2 mm long, with membranous margins; the lemma body is 3.5-4.5 mm long, obscurely 6-7-nerved, smooth on the back except for a few scattered hairs near the base and two small tufts at the level of the sinus, a tuft of hairs on the callus, and one tuft (the upper) near each margin; the lateral lobes are acute, very short, scarcely separating from the central awn; central awn brown, slightly twisted in the lower part or straight; the palea reaching almost to the top of the lobes Habitat: occurs in subalpine treeless vegetation, and is mainly recorded from stream-sides, the edges of tarns, and in and around bogs. Habitat requirement (general): Small flats on the edges of creeks and rivers, on small gravel bars and in sphagnum mounds or within 20 m; Waterbodies; Alpine bogs or within 20m.		Assumed present

Common Name <i>Scientific name</i>	EPBC Act Status	BC Act Status	FM Act Status	Identification. Source: Australian Museum, 2022; DPI, 2025; DCCEEW – NSW, 2025a; DCCEEW – NSW, 2025b; DCCEEW - NSW, 2025c	Photo. Source: Birdlife Australia, 2022; EBIRD, 2025; DPI, 2025; DCCEEW – NSW, 2025c	Status within HLW
Woolly Ragwort <i>Senecio garlandii</i>		Vulnerable		Description: is a many-branched perennial herb or shrub growing to 1.2 m tall. It has woolly stems, and large leaves, which are also woolly below, to 15 cm long and 8 cm wide, with toothed edges. The leaves are stalkless and clasp the stem. The numerous small yellow flower-heads are clustered in sprays. Habitat: occurs on sheltered slopes of rocky outcrops. Flowering: usually September to November.		Recorded
Small Purple-pea <i>Swainsona recta</i>	Endangered	Endangered		Description: a slender, erect perennial herb growing to 30 cm tall. The leaves are divided into up to six pairs of 10 mm long, very narrow leaflets, each with a pointed tip. There is also a single leaflet at the end of each divided leaf. It bears one to several sprays of between 10 and 20 purple, pea-shaped flowers. Habitat: Grows in association with understory dominants that include Kangaroo Grass <i>Themeda australis</i>, poa tussocks <i>Poa</i> spp. and spear-grasses <i>Austrostipa</i> spp. Flowering: between late September and early December.		Recorded

Common Name <i>Scientific name</i>	EPBC Act Status	BC Act Status	FM Act Status	Identification. Source: Australian Museum, 2022; DPI, 2025; DCCEEW – NSW, 2025a; DCCEEW – NSW, 2025b; DCCEEW - NSW, 2025c	Photo. Source: Birdlife Australia, 2022; EBIRD, 2025; DPI, 2025; DCCEEW – NSW, 2025c	Status within HLW
Silky Swainson-pea <i>Swainsona sericea</i>		Vulnerable		Description: is a prostrate or erect perennial, growing to 10 cm tall. The stems and leaves are densely hairy. The leaves are up to 7 cm long, composed of 5 - 13 narrow, pointed leaflets, each up to 15 mm long. The purple pea-shaped flowers are to 11 mm long, and are held in groups of up to 8 flowers, on a stem to 10 cm tall. Habitat: in Natural Temperate Grassland and Snow Gum <i>Eucalyptus pauciflora</i> Woodland on the Monaro also Found in Box-Gum Woodland in the Southern Tablelands and South West Slopes. Flowering: usually September to November.		Recorded
Alpine Sun-orchid <i>Thelymitra alpicola</i>		Vulnerable		Description: Leaf linear to linear-lanceolate, 6–25 cm long, 4–13 mm wide, erect, dark green with purplish base. Scape 15–50 cm tall, 1–3.7 mm diam., straw-coloured to purplish. Pedicels 3–18 mm long, slender. Flowers 1–6, 15–34 mm across, deep purplish blue with darker longitudinal striations, opening freely in warm weather. Habitat: occurs in wet heaths and adjacent to Sphagnum bogs between 1000-1500 metres. Flowering: occurs from late November to mid-December		Recorded
Austral Toadflax <i>Thesium australe</i>	Vulnerable	Vulnerable		Description: is a small, straggling herb to 40 cm tall. Leaves are pale green to yellow-green, somewhat succulent, 1 - 4 cm long and 0.5 - 1.5 mm wide. Flowers are minute and white, emerging where the leaves meet the stems. Habitat: Occurs in grassland on coastal headlands or grassland and grassy woodland away from the coast. Flowering: September to November.		Recorded

Common Name <i>Scientific name</i>	EPBC Act Status	BC Act Status	FM Act Status	Identification. Source: Australian Museum, 2022; DPI, 2025; DCCEEW – NSW, 2025a; DCCEEW – NSW, 2025b; DCCEEW - NSW, 2025c	Photo. Source: Birdlife Australia, 2022; EBIRD, 2025; DPI, 2025; DCCEEW – NSW, 2025c	Status within HLW
Swamp Everlasting <i>Xerochrysum palustre</i>	Vulnerable			Description: a perennial erect herb up to 100cm tall, the leaves are narrow, alternate, sessile, lanceolate, and partially stem clasping, to 10cm x 8mm. Habitat: grow in swampy habitats such as sedgy-heathy wetlands, heathlands and woodlands.		Recorded

4. References

- Australian Museum (2022) Discover & Learn. Retrieved from: <https://australian.museum/>
- BirdLife Australia (2025). Find a bird. Accessed April 2024. Retrieved from: <https://birdlife.org.au/>
- Department of Climate Change, Energy, the Environment, and Water – New South Wales [DCCEEW - NSW] (2025a). BioNet Atlas of NSW Wildlife. Retrieved from: http://www.environment.nsw.gov.au/atlaspublicapp/UI_Modules/ATLAS_/AtlasSearch.aspx?who=ddb86a5f-2881-40ec-b09d-5b2c6ce0d614.
- DCCEEW – NSW (2025b) BioNet Species Sightings Data. Retrieved from: <https://www.environment.nsw.gov.au/topics/animals-and-plants/biodiversity/nsw-bionet/about-bionet-atlas/species-sightings-data>
- DCCEEW – NSW (2025c). Threatened Biodiversity Profile Search. Retrieved from: <https://www.environment.nsw.gov.au/threatenedspeciesapp/>
- Department of Planning, Industry and Environment [DPIE] (2019). Translocation Operational Policy. Retrieved from: <https://www.environment.nsw.gov.au/research-and-publications/publications-search/translocation-operational-policy>
- Department of Primary Industries [DPI] (2025). Threatened species profiles. Retrieved from: <https://www.dpi.nsw.gov.au/fishing/threatened-species/what-current>
- eBIRD (2025) Discover a new world of Birding. Accessed April 2025. Retrieved from: <https://ebird.org/home>
- Niche Environment and Heritage Pty Ltd (2024). HumeLink Biodiversity Development Assessment Report EIS Technical Report 1 Rev 0. Version: June 2024
- UGL Pty Ltd (2025). HumeLink West, Construction Environmental Management Plan

Annexure E

Biosecurity Management Plan

HumeLink West

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Revision: 3

TransGrid
Date 28/07/2025

Document Control

Approvals

Title	HumeLink West Biosecurity Management Plan
Endorsed by Environment Representative	Derek Low (WolfPeak Pty Ltd)
Approved on behalf of HLWJV by	Tim Burns
Signed	
Dated	

Version Control

Revision	Date	Description	Approval
A	30/05/2024	First Draft	Jim Maniord
B	3/07/2024	Updates following receipt of UMMs and HLW mapping files	Paul Dudding
C	19/08/2024	Amendments following TG review	Paul Dudding
1	20/12/2024	Updates following receipt of final MCoAs and draft CoMA	Tim Burns
2	4/06/2025	Updates following ER, FCNSW & CPHR review	Tim Burns
3	28/07/2025	Updates following ER & CPHR review	Tim Burns

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Abbreviations

Abbreviation	Expanded text
BDAR	Biodiversity Development Assessment Report
BMP	Biodiversity Management Plan
CEMP	Construction Environment Management Plan
cm	centimetre
CoMA	Commonwealth Conditions of Ministerial Approval
CPHR	Conservation Programs, Heritage and Regulation
DPI	Department of Primary Industries
DPIE	Department of Planning, Industry and Environment
FCNSW	Forestry Corporation NSW
FM Act	<i>Fisheries Management Act 1994</i>
HLW	The HumeLink West Stage of the HumeLink project
HLWJV	HumeLink West Joint Venture (UGL Limited and CPB Contractors)
HLW Area	Approved disturbance footprint of the HumeLink West Stage of the HumeLink project
KNP	Kosciuszko National Park
m	metres
MCoA	New South Wales Minister's Conditions of Approval
NPW Act	<i>National Parks and Wildlife Act 1974</i>
NPWS	National Parks and Wildlife Service
NSW	New South Wales
OEH	Office of Environment and Heritage
Revised BDAR	<i>HumeLink Biodiversity Development Assessment Report Rev 0</i> (Niche Environment and Heritage Pty Ltd, June 2024)
TARP	Trigger Action Response Plan
TG	Transgrid
UMM	Updated Environmental Management Measure as outlined in the Planning Approvals Documentation
WoNS	Weeds of National Significance

1. Introduction

1.1. Context

This Biosecurity Management Plan (the plan) forms part of the Biodiversity Management Sub-plan (BMP) of the HumeLink West project (HLW) Construction Environmental Management Plan (CEMP). The Biosecurity Management Plan has been prepared to outline and describe how the UGL Limited and CPB Contractors Joint Venture (HLWJV), during the construction of HLW, will comply with the Minister's Conditions of Approval (MCoA), the Federal Minister for Water and Environment Condition of Ministerial Approval (CoMA), the Updated Environmental Management Measures (UMM), and undertake its duties in accordance with the Planning Approval Documentation listed under the MCoA.

1.2. Purpose

This plan has been prepared based on current best practice to minimise and manage the potential biosecurity impacts of HLW, in accordance with the *Biosecurity Act 2015*. The plan aims to address relevant actions and mitigation measures outlined in the following documents:

- Mitigation measures B3 and B22 of the *HumeLink Biodiversity Development Assessment Report Rev 0* (Revised BDAR; Niche Environment and Heritage Pty Ltd, June 2024).
- Condition B25 and B30 of Minister's Conditions of Approval (MCoA) A2.
- Condition 2 and 7 of Federal Minister for Water and Environment Condition of Ministerial Approval.

1.3. Objectives

The key objective of the plan is to ensure that all avoidance, mitigation, and management measures relevant to biosecurity referred to in the environmental assessment documents and relevant permits and approvals are addressed. This management plan will achieve this objective through the following:

- Detail existing priority weed species, relevant pests and diseases of concern.
- Outline the implementation of appropriate processes to manage the spread of weeds, pests and diseases.
- How the implementation of practical measures will be undertaken during construction to avoid the introduction of new weeds and to minimise the spread of existing weeds.

2. Environmental requirements

2.1. Legislation

Legislation relevant to this plan includes:

- *National Parks and Wildlife Act 1974* (NPW Act).
- *Fisheries Management Act 1994* (FM Act).
- *Biosecurity Act 2015*.
- *Pesticides Act 1999*.
- *Protection of the Environment Operations Act 1997*.

2.2. Guidelines and standards

The following guidelines were considered in the development and implementation of this plan:

- *Regional Pest Management Strategy 2012-2017: Southern Ranges Region* (OEH, 2012).
- Noxious and Environmental Weed Control Handbook and website (DPI, 2018).
- Weed Cooperative Research Centre for Best Practice Management Guides.
- *Hygiene guidelines, Protocols to protect priority biodiversity areas in NSW from Phytophthora cinnamomi, myrtle rust, amphibian chytrid fungus and invasive plants* (DPIE, 2020).
- *Threat abatement plan for disease in natural ecosystems caused by Phytophthora cinnamomi* (Department of the Environment and Energy, 2018).

2.3. Preparation of this plan

In accordance with MCoA B30a, this plan has been prepared by suitably qualified and experienced biodiversity experts of RPS AAP Consulting Pty Ltd:

- Polina Zadorojnaya (BSc; BAM Accredited Assessor BAAS 23014).
- Joe Baird (BSc).
- Chelsea Tiller (BSc).
- Heather Duff (BScHons Geology; BSc).

Unless otherwise agreed by the Planning Secretary, within 4 months of the commencement of the Enabling Works, this strategy will be updated to incorporate any relevant aspects of the Enabling Works Management Plan.

2.4. Consultation

Consultation undertaken in preparation of this plan is summarised in Section 4 of the HLW BMP. If consultation with relevant stakeholders or regulators is required to assess the efficacy of mitigation strategies detailed in this report, these will be undertaken in accordance with Section 8.3 of the HLW BMP.

2.5. Minister's Conditions of Approval

The MCoA relevant to this plan are listed in Table 2-1. A cross reference is also included to indicate where and how the conditions are addressed in this plan or other HLW management documents.

Table 2-1 MCoA relevant to this plan

MCoA No.	Condition Requirements	Document Reference
Restrictions 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	Not addressed in this plan – refer Section 5.2 and 6.2 of the HLW BMP and Annexure B: Clearing Protocol.
	(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	This plan includes provisions for minimising biosecurity impacts on native vegetation and threatened species through preventative (Section 5.1) and control measures (Section 5.2).
	(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 Alps Bioregion</i> and 30 metres from known locations of <i>Prasophyllum bagoense</i> , <i>Prasophyllum keltonni</i> and <i>Pterostylis oreophila</i> as mapped in the BDAR.	Not addressed in this plan – refer Section 6.2 of the HLW BMP and Annexure H: Biodiversity Monitoring Program.
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 plan forms part of the HLW BMP.

MCoA No.	Condition Requirements	Document Reference
	(a) be prepared by a suitably qualified and experienced biodiversity expert/s;	Section 2.3.
	(b) be prepared in consultation with CPHR and FCNSW;	Section 2.4.
	(c) be prepared generally in accordance with the <i>Revised Biodiversity Development Assessment Report</i> (Revision 0, dated 21 June 2024);	Table 2-3.
	(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;	Not addressed in this plan – refer to HLW BMP.
	(ii) minimising: - the amount of vegetation clearing on site; - the loss of key fauna habitat (including tree hollows); - the impacts of fauna on site, including undertaking pre-clearance surveys; and - potential indirect impacts on threatened flora and fauna species;	This plan includes provisions for minimising biosecurity impacts on native vegetation and threatened species through preventative (Section 5.1) and control measures (Section 5.2).
	(iii) ensuring the development does not adversely affect the native vegetation and habitat outside the disturbance footprint;	This plan includes provisions for minimising indirect biosecurity impacts on native vegetation and threatened species outside of the disturbance footprint through preventative (Section 5.1) and control measures (Section 5.2).
	(iv) protocols for unexpected finds of threatened species and threatened ecological	Not addressed in this plan

MCoA No.	Condition Requirements	Document Reference
	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 CPHR (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;	– refer Annexure D: Unexpected Finds Procedure.
	(v) connectivity strategy for the potentially impacted species identified in the Revised Biodiversity Development Assessment Report (Revision 0, dated 21 June 2024) and a Supplementary Hollow and Nest Strategy;	Not addressed in this plan – refer to Annexure C: Hollow and Nest Strategy & Annexure F: Connectivity Strategy of the HLW BMP.
	(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 plan includes provisions for preventing (Section 5.1) and controlling (Section 5.2) the spread of weeds and pathogens which may indirectly impact these values.
	(vii) rehabilitating temporary disturbance areas to facilitate natural regeneration of suitable native species;	Not addressed in this plan – refer Annexure G: Rehabilitation Plan of the HLW BMP.
	(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	Not addressed in this plan – refer Annexure H: Biodiversity Monitoring

MCoA No.	Condition Requirements	Document Reference
	required to this plan;	Program of the HLW BMP.
	(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;	Not addressed in this plan – refer Annexure G: Rehabilitation Plan of the HLW BMP.
	(x) collecting and propagating seed (where relevant);	Not addressed in this plan – refer Annexure G: Rehabilitation Plan of the HLW BMP.
	(xi) controlling erosion, weeds and feral pests;	This entire plan has been developed to address this condition.
	(xii) bushfire management;	Not addressed in this plan – refer to HLW BMP.
	(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	This plan includes provisions for minimising biosecurity impacts on SAIL entities through preventative (Section 5.1) and control measures (Section 5.2).
	(e) include a program to monitor, evaluate and publicly report on the effectiveness of these measures.	Section 6.1.
	Following the Planning Secretary's approval, the Proponent must implement the Biodiversity	Section 2.3.

MCoA No.	Condition Requirements	Document Reference
	Management Plan. <i>Note: The Biodiversity Management Plan must incorporate all relevant aspects of the development, including Enabling Works consistent with the requirements of condition B67.</i>	

2.6. Federal Minister for Water and Environment Condition of Ministerial Approval

The CoMA relevant to this plan are listed in Table 2-2. A cross reference is also included to indicate where and how the conditions are addressed in this plan or other HLW management documents.

Table 2-2 CoMA relevant to this plan

EPBC Condition No.	Condition Requirements	Document Reference
Clearing Limits		
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.	Refer Table 2-1
Biodiversity Management Plan		
7	The approval holder must comply with condition B30 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.	Refer Table 2-1

2.7. Updated Environmental Management Measures

UMMs relevant to this plan are listed in Table 2-3 below. A cross reference is also included to indicate where and how the conditions are addressed in this plan or other HLW management documents.

Table 2-3 UMMs relevant to this plan

UMM No.	Condition Requirements	HLW Stage	Applicable location(s)	Document Reference
Biodiversity				
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 <i>Technical Report 1 – Revised Biodiversity Development Assessment Report</i>, including: Measures to minimise impacts to biodiversity, 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.	Detailed design and construction	All locations	This plan forms part of the HLW BMP. Section 5 and 6
	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.			Not addressed in this strategy – refer Annexure B: Clearing Protocol of the HLW BMP.
	Procedures for the demarcation and protection of retained vegetation, including vegetation adjacent to construction areas and during weed management.			Section 5.1.1 & 5.1.4

UMM No.	Condition Requirements	HLW Stage	Applicable location(s)	Document Reference
	Vegetation clearing procedures for a two staged habitat removal process required for removal of key habitat features (hollow-bearing trees, habitat trees, and bushrock) identified in <i>Technical Report 1 – Revised Biodiversity Development Assessment Report</i> (the BDAR) and/or pre-clearing inspection. Including procedures to record the effort and outcomes of the habitat removal process.			Not addressed in this plan – refer to HLW BMP
	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 assessed in <i>Technical Report 1 – Revised Biodiversity Development Assessment Report</i>, are encountered during pre-clearing inspections.			
	A description of biosecurity protocols for plant and equipment movement between sites, including species specific measures.			Section 5.1
	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.			Not addressed in this plan – refer to HLW BMP
	Outline monitoring and compliance management requirements.			Section 6
	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			Not addressed in this plan –

UMM No.	Condition Requirements	HLW Stage	Applicable location(s)	Document Reference
	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-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			refer to HLW BMP

UMM No.	Condition Requirements	HLW Stage	Applicable location(s)	Document Reference
	- 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 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.			
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.	Detailed design and construction	All locations	Section 3.1, 5 & 6.3
	Weed and pest animal management and monitoring requirements would also be outlined within the plan where relevant.	Detailed design and construction	All locations	Section 5 & 6.1
	Inclusion of a Trigger Action Response Plan (TARP) for key biosecurity threats including known biosecurity threats to threatened species and populations.	Detailed design and construction	All locations	Section 6.2

UMM No.	Condition Requirements	HLW Stage	Applicable location(s)	Document Reference
	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.	Detailed design and construction	All locations	Section 5.1
	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 species. The biosecurity plan would address any Property Management Plan requirements where relevant.	Detailed design and construction	All locations	Section 5.1.3
	<i>Phytophthora</i> 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.	Detailed design and construction	All locations	Section 5.2.2
	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	Detailed design and construction	All locations	TBD – Section 2.4
Land use and property				
LP2	A property management plan will be developed for directly impacted properties in consultation with landowners and stakeholders. The property management plans will outline the protocols that will be implemented to address landowner	Detailed design and construction	All locations	This plan has been developed to inform

UMM No.	Condition Requirements	HLW Stage	Applicable location(s)	Document Reference
	concerns during construction. This may include: - The process for rectification of any damage to property infrastructure caused by construction. - The process for rehabilitation and stabilization of disturbed areas following the completion of construction. - Measures to minimize disruption to agricultural practices during construction. - Any fencing and gate requirements. - Specific biosecurity protocols.			property management plans with regard to biosecurity protocols.
LP4	Biosecurity controls will be implemented to minimise the risk of off-site transport or spread of disease, pests or weeds. Controls will be in accordance with Transgrid's Biosecurity Procedure and Biosecurity Environmental Guidance Note and include development of specific controls if high biosecurity risks are identified. Appropriate measures will be implemented with respect to foot and mouth disease to control any risk of introduction via the project. The specific controls applicable to a property will be identified in consultation with the affected landowner. The effectiveness of these controls will be monitored in a manner and time interval consistent with the level of risk on each property. In the event of new infestations of notifiable weeds as a result of construction activities, the relevant control authority will be notified as per Biosecurity Act 2015 (NSW) and Biosecurity Regulation 2017.	Construction and operation	All locations	Section 5.1 and 5.2.

3. Existing environment

The following section summarises existing known weed, pest and pathogen species within the HLW Area including species, communities and habitats based on the information contained in the Revised BDAR.

3.1. Weeds

Priority Weeds are required to be managed under the *Biosecurity Act 2015*. This includes plants that are regulated with a general biosecurity duty to prevent, eliminate, or minimise any biosecurity risk they may pose. Any person who deals with any plant, who knows (or ought to know) of any biosecurity risk, has a duty to ensure the risk is prevented, eliminated, or minimised, so far as is reasonably practicable. It also includes prohibition on certain dealings, including plants that must not be imported into the state, sold, bartered, exchanged, or offered for sale. Weeds of National Significance (WoNS) are regarded as a current priority and future weed threat to Australia because of their invasiveness, potential for spread, and economic and environmental impacts.

3.1.1. Terrestrial weeds

Native vegetation within the HLW Area and surrounds has been modified by past disturbances associated with land clearing, livestock grazing, mining, forestry operations, public recreation and weed invasion. This has resulted in significant amounts of terrestrial weeds across the landscape.

3.1.2. Priority weeds

Twenty-one Priority weed species were identified during flora surveys of the Revised BDAR. These species are detailed in Table 3-1, along with applicable duties under the *Biosecurity Act 2015*.

3.1.3. Weeds of National Significance

Three WoNS were identified during flora surveys for HLW, as detailed in Table 3-1. These weeds are currently subject to control programs under the *Southern Ranges Regional Pest Management Strategy (2012-2017)* (OEH, 2012).

Table 3-1 Weeds of concern recorded within the HLW Area

Scientific Name	Common Name	Duty under Biosecurity Act 2015	Weed of National Significance	Images (Victorian Resources Online), (Western Australian Herbarium), (Sydney Weeds Network), (NSW WeedWise, 2024)
<i>Carthamus lanatus</i>	Saffron Thistle	General Biosecurity Duty - prevent, eliminate or minimise any biosecurity risk they may pose.	No	
<i>Centaurea solstitialis</i>	St Barnaby's Thistle	General Biosecurity Duty - prevent, eliminate or minimise any biosecurity risk they may pose.	No	

Scientific Name	Common Name	Duty under Biosecurity Act 2015	Weed of National Significance	Images (Victorian Resources Online), (Western Australian Herbarium), (Sydney Weeds Network), (NSW WeedWise, 2024)
<i>Cirsium arvense</i>	Perennial Thistle	General Biosecurity Duty - prevent, eliminate or minimise any biosecurity risk they may pose.	No	
<i>Cirsium vulgare</i>	Spear Thistle	General Biosecurity Duty - prevent, eliminate or minimise any biosecurity risk they may pose.	No	

Scientific Name	Common Name	Duty under Biosecurity Act 2015	Weed of National Significance	Images (Victorian Resources Online), (Western Australian Herbarium), (Sydney Weeds Network), (NSW WeedWise, 2024)
<i>Conyza bonariensis</i>	Flaxleaf Fleabane	General Biosecurity Duty - prevent, eliminate or minimise any biosecurity risk they may pose.	No	

Scientific Name	Common Name	Duty under Biosecurity Act 2015	Weed of National Significance	Images (Victorian Resources Online), (Western Australian Herbarium), (Sydney Weeds Network), (NSW WeedWise, 2024)
<i>Conyza sumatrensis</i>	Tall Fleabane	General Biosecurity Duty - prevent, eliminate or minimise any biosecurity risk they may pose.	No	  
<i>Echium plantagineum</i>	Patterson's Curse	General Biosecurity Duty - prevent, eliminate or minimise any biosecurity risk they may pose.	No	 

Scientific Name	Common Name	Duty under Biosecurity Act 2015	Weed of National Significance	Images (Victorian Resources Online), (Western Australian Herbarium), (Sydney Weeds Network), (NSW WeedWise, 2024)
<i>Echium vulgare</i>	Viper Bugloss	General Biosecurity Duty - prevent, eliminate or minimise any biosecurity risk they may pose.	No	
<i>Eragrostis curvula</i>	African Lovegrass	General Biosecurity Duty - prevent, eliminate or minimise any biosecurity risk they may pose.	No	

Scientific Name	Common Name	Duty under Biosecurity Act 2015	Weed of National Significance	Images (Victorian Resources Online), (Western Australian Herbarium), (Sydney Weeds Network), (NSW WeedWise, 2024)
<i>Hypericum perforatum</i>	St. John's Wort	General Biosecurity Duty - prevent, eliminate or minimise any biosecurity risk they may pose.	No	
<i>Marrubium vulgare</i>	White Horehound	General Biosecurity Duty - prevent, eliminate or minimise any biosecurity risk they may pose.	No	

Scientific Name	Common Name	Duty under Biosecurity Act 2015	Weed of National Significance	Images (Victorian Resources Online), (Western Australian Herbarium), (Sydney Weeds Network), (NSW WeedWise, 2024)
<i>Nassella neesiana</i>	Chilean Needle Grass	General Biosecurity Duty - prevent, eliminate or minimise any biosecurity risk they may pose. Regional Recommended Measure - (Eradication) Land managers should mitigate the risk of new weeds being introduced to their land. The plant should be eradicated from the land and the land kept free of the plant. The plant should not be bought, sold, grown, carried or released into the environment.	Yes	
<i>Onopordum acanthium</i>	Scotch Thistle	General Biosecurity Duty - prevent, eliminate or minimise any biosecurity risk they may pose.	No	

Scientific Name	Common Name	Duty under Biosecurity Act 2015	Weed of National Significance	Images (Victorian Resources Online), (Western Australian Herbarium), (Sydney Weeds Network), (NSW WeedWise, 2024)
<i>Proboscidea louisianica</i>	Purple-flowered Devil's Claw	General Biosecurity Duty - prevent, eliminate or minimise any biosecurity risk they may pose.	No	
<i>Rosa rubiginosa</i>	Sweet Briar	General Biosecurity Duty - prevent, eliminate or minimise any biosecurity risk they may pose.	No	

Scientific Name	Common Name	Duty under Biosecurity Act 2015	Weed of National Significance	Images (Victorian Resources Online), (Western Australian Herbarium), (Sydney Weeds Network), (NSW WeedWise, 2024)
<i>Rubus fruticosus</i> sp. agg.	Blackberry	General Biosecurity Duty - prevent, eliminate or minimise any biosecurity risk they may pose. Prohibition on certain dealings - Must not be imported into the state, sold, bartered, exchanged or offered for sale.	Yes	
<i>Senecio madagascariensis</i>	Fireweed	General Biosecurity Duty - prevent, eliminate or minimise any biosecurity risk they may pose. Prohibition on certain dealings - Must not be imported into the state, sold, bartered, exchanged or offered for sale. Regional Recommended Measure - (Eradication) Land managers should mitigate the risk of new weeds being introduced to their land. The plant should be eradicated	Yes	

Scientific Name	Common Name	Duty under Biosecurity Act 2015	Weed of National Significance	Images (Victorian Resources Online), (Western Australian Herbarium), (Sydney Weeds Network), (NSW WeedWise, 2024)
		from the land and the land kept free of the plant. The plant should not be bought, sold, grown, carried or released into the environment.		
<i>Xanthium italicum</i>	Hunter Burr	General Biosecurity Duty - prevent, eliminate or minimise any biosecurity risk they may pose.	No	

Scientific Name	Common Name	Duty under Biosecurity Act 2015	Weed of National Significance	Images (Victorian Resources Online), (Western Australian Herbarium), (Sydney Weeds Network), (NSW WeedWise, 2024)
<i>Xanthium occidentale</i>	Noogoora Burr	General Biosecurity Duty - prevent, eliminate or minimise any biosecurity risk they may pose.	No	
<i>Xanthium orientale</i>	Californian Burr	General Biosecurity Duty - prevent, eliminate or minimise any biosecurity risk they may pose.	No	

Scientific Name	Common Name	Duty under Biosecurity Act 2015	Weed of National Significance	Images (Victorian Resources Online), (Western Australian Herbarium), (Sydney Weeds Network), (NSW WeedWise, 2024)
<i>Xanthium spinosum</i>	Bathurst Burr	General Biosecurity Duty - prevent, eliminate or minimise any biosecurity risk they may pose.	No	

3.1.4. Regional priority weeds

The HLW Area falls within two Local Land Service Regions: South East & Riverina Regions. Each has its own Regional Strategic Weeds Management Plan (LLS, 2022a & 2022b).

Regional priority weeds are regulated through the general biosecurity duty and each weed has a management category (Table 3-2). Regionally recommended measures are listed for each weed and communicate how landholders and stakeholders in the region should conduct their general biosecurity duty for that weed.

Regional priority weeds have been assessed by regional weed committees as posing a high risk to specific regions of NSW. Riverina and South East regional priority weeds are identified in Table 3-3 as key species of concern to be monitor closely for.

Table 3-2 Defining regional weed management categories

Management Strategy	Objective	Characteristics of weeds in this category
Prevention	To prevent the weed species arriving and establishing in the region.	Weeds currently not found in the region, that pose a significant biosecurity risk and prevention of the biosecurity risk posed by these weeds is a reasonably practicable objective.
Eradication	To permanently remove the species and its propagules from the region OR to destroy infestations to reduce the extent of the weed in the region with the aim of local eradication.	Weeds are present in limited abundance in the region. Elimination of the biosecurity risk posed by these weeds is a reasonably practicable objective.
Containment	To prevent the ongoing spread of the species in all or part of the region.	These weeds are widely distributed in parts of the region. While broad scale elimination is not practicable, minimisation of the biosecurity risk posed by these weeds is reasonably practicable.
Asset protection	To prevent the spread of weeds to key sites/assets of high economic, environmental and social value, or to reduce their impact on these sites if spread has already occurred.	These weeds are widely distributed in some areas of the region. Their spread should be minimised to protect priority regional assets.

Table 3-3 Riverina & South East Regions priority weeds

Common Name	Scientific name	Regional Management priority	Priority Weed in Local Land Service Region	Images (NSW WeedWise, 2025)
Alligator weed	<i>Alternanthera philoxeroides</i>	Eradication	Riverina	
Black willow	<i>Salix nigra</i>	Containment	Riverina	
Boneseed	<i>Chrysanthemoides monilifera</i> subsp. <i>monilifera</i>	Eradication	Riverina	

Common Name	Scientific name	Regional Management priority	Priority Weed in Local Land Service Region	Images (NSW WeedWise, 2025)
Cane needlegrass	<i>Nassella hyalina</i>	Eradication (Exception: Containment for Wagga)	Riverina	
Cape/Montpellier broom	<i>Genista monspessulana</i>	Eradication	Riverina	

Common Name	Scientific name	Regional Management priority	Priority Weed in Local Land Service Region	Images (NSW WeedWise, 2025)
Cat's claw creeper	<i>Dolichandra unguis-cati</i> (syn. <i>Macfadyena unguis-cati</i>)	Eradication	South East	
Chilean needlegrass	<i>Nassella neesiana</i>	Eradication	Riverina	

Common Name	Scientific name	Regional Management priority	Priority Weed in Local Land Service Region	Images (NSW WeedWise, 2025)
Chinese violet	<i>Asystasia gangetica</i> <i>subsp. micrantha</i>	Prevention	Riverina	
Coolatai grass	<i>Hyparrhenia hirta</i>	Containment	Riverina, South East	

Common Name	Scientific name	Regional Management priority	Priority Weed in Local Land Service Region	Images (NSW WeedWise, 2025)
Coral creeper	<i>Barleria repens</i>	Prevention	South East	
Fireweed (SP)	<i>Senecio madagascariensis</i>	Eradication	Riverina	

Common Name	Scientific name	Regional Management priority	Priority Weed in Local Land Service Region	Images (NSW WeedWise, 2025)
Giant devil's fig	<i>Solanum chrysotrichum</i>	Eradication	South East	
Gorse	<i>Ulex europaeus</i>	Containment	Riverina, South East	

Common Name	Scientific name	Regional Management priority	Priority Weed in Local Land Service Region	Images (NSW WeedWise, 2025)
Green cestrum	<i>Cestrum Parqui</i>	Eradication	Riverina	
Grey sallow	<i>Salix cinerea</i>	Containment	Riverina	

Common Name	Scientific name	Regional Management priority	Priority Weed in Local Land Service Region	Images (NSW WeedWise, 2025)
Groundsel bush	<i>Baccharis halimifolia</i>	Eradication	South East	
Holly leaved senecio	<i>Senecio glastifolius</i>	Prevention	South East	

Common Name	Scientific name	Regional Management priority	Priority Weed in Local Land Service Region	Images (NSW WeedWise, 2025)
Horsetails	<i>Equisetum spp.</i>	Prevention	Riverina, South East	
Kei apple	<i>Dovyalis caffra</i>	Eradication	South East	
Kidney leaf mud plantain	<i>Heteranthera reniformis</i>	Prevention	South East	
Kidney leaf mud plantain	<i>Heteranthera reniformis</i>	Eradication	Riverina	

Common Name	Scientific name	Regional Management priority	Priority Weed in Local Land Service Region	Images (NSW WeedWise, 2025)
Kudzu	<i>Pueraria lobata</i>	Eradication	South East	
Lantana	<i>Lantana camara</i>	Containment	South East	

Common Name	Scientific name	Regional Management priority	Priority Weed in Local Land Service Region	Images (NSW WeedWise, 2025)
Long leaf water primrose	<i>Ludwigia longifolia</i>	Eradication	South East	
Ludwigia	<i>Ludwigia peruviana</i>	Eradication	South East	
Mesquite	<i>Prosopis spp.</i>	Eradication	Riverina	

Common Name	Scientific name	Regional Management priority	Priority Weed in Local Land Service Region	Images (NSW WeedWise, 2025)
Ming asparagus fern/pompom asparagus	<i>Asparagus macowanii</i> <i>var. zuluensis</i>	Eradication	South East	
Mother-of-millions	<i>Bryophyllum spp.</i>	Eradication	Riverina	

Common Name	Scientific name	Regional Management priority	Priority Weed in Local Land Service Region	Images (NSW WeedWise, 2025)
Mysore thorn	<i>Caesalpinia decapetala</i>	Containment	South East	
Parkinsonia	<i>Parkinsonia aculeata</i>	Prevention	Riverina	

Common Name	Scientific name	Regional Management priority	Priority Weed in Local Land Service Region	Images (NSW WeedWise, 2025)
Perennial ground cherry	<i>Physalis longifolia</i>	Eradication	Riverina	
Ragwort	<i>Senecio jacobaea</i>	Prevention	Riverina	

Common Name	Scientific name	Regional Management priority	Priority Weed in Local Land Service Region	Images (NSW WeedWise, 2025)
Sagittaria	<i>Sagittaria platyphylla</i>	Eradication (Exception: Containment for Griffith)	Riverina	
Salvinia	<i>Salvinia molesta</i>	Eradication	Riverina, South East	

Common Name	Scientific name	Regional Management priority	Priority Weed in Local Land Service Region	Images (NSW WeedWise, 2025)
Scotch/English broom	<i>Cytisus scoparius</i> <i>subsp. scoparius</i>	Containment	Riverina	
Sea spurge	<i>Euphorbia paralias</i>	Containment	South East	
Senegal tea plant	<i>Gymnocoronis</i> <i>spilanthoides</i>	Eradication	South East	

Common Name	Scientific name	Regional Management priority	Priority Weed in Local Land Service Region	Images (NSW WeedWise, 2025)
Senegal tea plant	<i>Gymnocoronis spilanthoides</i>	Prevention	Riverina	
Serrated tussock	<i>Nassella trichotoma</i>	Eradication	Riverina	

Common Name	Scientific name	Regional Management priority	Priority Weed in Local Land Service Region	Images (NSW WeedWise, 2025)
Sickle thorn	<i>Asparagus falcatus</i>	Prevention	South East	
Silverleaf nightshade	<i>Solanum elaeagnifolium</i>	Eradication	South East	

Common Name	Scientific name	Regional Management priority	Priority Weed in Local Land Service Region	Images (NSW WeedWise, 2025)
Spanish heath	<i>Erica lusitanica</i>	Containment	South East	
Sticky nightshade	<i>Solanum sisymbriifolium</i>	Eradication	South East	

Common Name	Scientific name	Regional Management priority	Priority Weed in Local Land Service Region	Images (NSW WeedWise, 2025)
Tropical soda apple	<i>Solanum viarum</i>	Prevention	Riverina	
Water hyacinth	<i>Eichhornia crassipes</i>	Eradication	Riverina	
Water lettuce	<i>Pistia stratiotes</i>	Eradication	South East	
Water lettuce	<i>Pistia stratiotes</i>	Prevention	Riverina	

Common Name	Scientific name	Regional Management priority	Priority Weed in Local Land Service Region	Images (NSW WeedWise, 2025)
Water poppy	<i>Hydrocleys nymphoides</i>	Eradication	South East	
Water poppy	<i>Hydrocleys nymphoides</i>	Prevention	Riverina	
Water star grass	<i>Heteranthera zosterifolia</i>	Prevention	South East	

Common Name	Scientific name	Regional Management priority	Priority Weed in Local Land Service Region	Images (NSW WeedWise, 2025)
Yellow water lily	<i>Nymphaea mexicana</i>	Prevention	Riverina	

3.1.5. Aquatic weeds

The Tumut River, which feeds into Talbingo Reservoir, intersects a portion of HLW under the Transmission Line corridor. Canadian Pondweed (*Elodea canadensis*; Plate 1) is known to occur throughout Talbingo reservoir. Canadian Pondweed is often associated with slow-moving and stationary water bodies, coastal rivers and creeks, especially in colder areas of NSW. It grows and spreads via fragmentation, and as stems readily break into pieces, these are easily transported in water. Canadian Pondweed is classified as a water weed which is known to:

- Alter dissolved oxygen levels reducing the water quality.
- Restrict navigation and recreational activities on waterways.
- Pose a drowning hazard for livestock and recreational swimmers.

Across NSW, the general biosecurity duty applicable to this weed is to prevent, eliminate or minimise any biosecurity risk they may pose. Any person who deals with any plant, who knows (or ought to know) of any biosecurity risk, has a duty to ensure the risk is prevented, eliminated or minimised, so far as is reasonably practicable.



Plate 1 Example of *Elodea canadensis* (Canadian Pondweed; NSW WeedWise, 2024).

3.2. Pathogens

No evidence of pathogens such as Root Rot (*Phytophthora cinnamomi*), Myrtle Rust (*Austropuccinia psidii*) and Chytrid Fungus (*Batrachochytrium dendrobatidis*) or Epizootic Haematopoietic Necrosis Virus were recorded within the HLW Area. However, these have potential to occur and be imported

onto site.

Infection of native plants by *Phytophthora cinnamomi* is listed as a Key Threatening Process under the BC Act and EPBC Act. *Phytophthora cinnamomi* can lead to death of trees and shrubs, resulting in devastation of native ecosystems (NPWS, 2006). Infection of susceptible communities with *Phytophthora cinnamomi* may lead to:

- Changes in the structure and composition of the native plant communities.
- A significant reduction in primary productivity and functionality.
- Habitat loss and degradation for dependent flora and fauna.

Phytophthora has been detected in locations associated with the adjoining Snowy 2.0 project and in Lob's Hole. Recent surveys of KNP have detected three species that are likely to be the most destructive of environmental values: *Phytophthora cinnamomi*, *Phytophthora gregata* and *Phytophthora multivora*. Very little of the park is currently suitable for *Phytophthora cinnamomi* 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 habitat for *Phytophthora cinnamomi*. *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. The HLW Area does not overlap with KNP and there are no plans for vehicle movements in the National Park.

'Introduction and establishment of Exotic Rust Fungi of the order *Pucciniales* pathogenic on plants of the family Myrtaceae' is listed as a KTP under the BC Act. Myrtle Rust is plant disease, caused by an introduced fungal pathogen, affects plant species in the Myrtle family (Myrtaceae), which are key, and often dominant, species in many Australian ecosystems. No known occurrences of Myrtle Rust occur within the vicinity.

'Infection of amphibians with chytrid fungus resulting in chytridiomycosis' is listed as a Key Threatening Process under the BC Act and EPBC Act. Chytridiomycosis in frogs has been recorded in the nearby Kosciuszko National Park (KNP; NPWS, 2006). The disease, caused by Chytrid Fungus (*Batrachochytrium dendrobatidis*) which has been detected in the vicinity of the HLW area, has been detected in a number of threatened frog species, though it remains unclear whether it constitutes the primary cause of recent frog population declines.

'Epizootic haematopoietic necrosis of fish (EHNV)' is listed under notifiable matter under Schedule 1 of the *Biosecurity Regulation 2017*. EHNV is a disease that causes destruction of blood forming organs in outbreaks involving affected fish, particularly known host species, Redfin and Rainbow Trout (DPI, 2025; Snowy Hydro, 2023). Several native species, including Macquarie perch, are susceptible to EHNV under laboratory conditions, although natural disease events caused by EHNV have never been detected in species other than Redfin and Rainbow Trout (Snowy Hydro, 2023; Hick et al. 2019; Cardno, 2019). Whilst no known occurrences or outbreak of EHNV have been detected within the vicinity, concerns regarding the water transfer within the adjoining Snowy 2.0 project could increase the range of EHNV (Snowy Hydro, 2023).

3.3. Predator and pests

The HLW Area consists of large areas of agricultural lands, which likely provide suitable habitat for a variety of predator and pest species. The following predator and pest species have been recorded within the HLW Area:

- Goat (*Capra hircus*).
- Deer (*Cervus* sp.).
- Horse (*Equus caballus*).
- Cat (*Felis catus*).

- House Mouse (*Mus musculus*).
- Rabbit (*Oryctolagus cuniculus*).
- Black Rat (*Rattus rattus*).
- Spotted Dove (*Spilopelia chinensis*).
- Common Starling (*Sturnus vulgaris*).
- Pig (*Sus scrofa*).
- Eurasian Blackbird (*Turdus merula*).
- Fox (*Vulpes vulpes*).

Observations of predator and pest species were not limited to any one habitat type, and it is likely that they occur throughout the HLW Area.

3.3.1. Feral Horse (*Equus caballus*)

Feral horses are present along the HLW Area particularly the Green Hills State Forest Area. They predominantly inhabit public lands, including national parks and state forests, with occasional movements onto adjacent private properties. Their presence negatively affects environmental values through grazing of native vegetation and soil disturbance, especially in alpine and sub-alpine environments. The negative environmental impact of feral horses has been formally recognised by the listing of habitat degradation and loss by feral horses as a KTP under the BC Act. Additionally, feral horses pose a notable risk to public safety in areas near main roads and highways due to the potential for vehicle collisions (LLS, 2024a, 2024b).

4. Environmental aspects and impacts

The relationship between environmental aspects and impacts can be best explained as cause and effect. Details of the biosecurity-specific aspects as well as known and potential impacts are summarised below. Refer to Appendix A2 of the CEMP for the full HLW Aspects and Impacts Register.

4.1. Aspects

Key aspects of the HLW that could result in biosecurity impacts include:

- Vegetation clearing and topsoil stripping.
- Earthwork.
- Movement of vehicles.
- Construction of watercourse crossings.
- Demolition works.
- Site access.
- Material stockpiles.
- Generator use.
- Establishment and use of construction support sites including potential impacts on flood behaviour and vehicle wash down.

4.2. Potential impacts

The potential for impacts on biosecurity will depend on a number of factors. 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 include the following:

- Introduction of weeds and pathogens.
- Spread of weeds and pathogens, resulting in degradation of retained native vegetation and habitat.

The environmental management measures described below have been developed to minimise and mitigate the impacts on biosecurity as a result of HLW construction.

The most significant pest animals in the HLW Area include pigs, foxes and rabbits. Construction activities in already predominately cleared landscapes (i.e., areas previously cleared for agriculture) of are unlikely to significantly change the number or movement patterns of these pests. However, fragmentation of undisturbed dense forested habitat may have increased exposure to exotic fauna that were previously not able to access this landscape (Dickman 1996; May and Norton 1996).

5. Environmental control measures

A range of environmental requirements and control measures are identified in the HumeLink Revised BDAR and conditions of approval. Safeguards and management measures will be implemented to avoid, minimise or manage impacts from the introduction and spread of weeds and pathogens. Transgrid will act as the property manager and will be responsible for fulfilling general biosecurity duties and managing weed and pest control in accordance with the *Biosecurity Act 2015* (NSW).

Management measures for the control of weeds and pathogens will be undertaken via three methods: prevention, control and disposal as detailed below.

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5.1. Prevention

HLWJV will implement the following measures to prevent the introduction or spread of weeds pathogens on site:

- Baseline weed surveys.
- Hygiene inspections and completed Weed Hygiene Declarations of vehicles, vessels, plant and equipment being transported onsite.
- Application of washdown locations and/or disinfection points at key locations onsite supported by hygiene/disinfection records.
- Restricted access to areas of known weed/pathogen infestation sites.
- No-go zones.

5.1.1. Baseline surveys

Prior to the commencement of clearing, weeds will be mapped within the HLW Area during pre-clearing surveys. Given the large area of impact associated with HLW, weed mapping may be undertaken on-foot, using drones or using binoculars to assess a larger area from a vantage point. The surveys will also assist with developing 'restricted areas' and updated hygiene protocols for the works by the Project Ecologist. Restricted areas will be considered areas of dominant weed infestation and will have specific measures as outlined in Section 5.1.4 below. When restricted areas are identified, these will be translated to the HLW Environmental Plans, with washdown areas clearly represented.

Additionally, a soil sampling program will be undertaken prior to construction by a suitably qualified person(s) to test for presence/absence of *Phytophthora* within the HLW Area. The sampling and monitoring will follow the methodology outlined in Section 6.1.3. Similar to the weed surveys, this sampling will assist in identifying any required restricted areas, with pathogens and form a baseline for the ongoing monitoring. Likewise, as for weeds, HLW Environmental Plans will represent pathogen restricted areas with disinfection points clearly represented.

5.1.2. Hygiene declaration and inspections

All suppliers of plant and equipment, HLWJV and contractors will be informed of their general obligation under the *Biosecurity Act 2015* to prevent the introduction and spread of diseases, weeds and contaminants. The suppliers will be expected to present their materials and equipment clean and free of dirt, mud, seed and biological materials including weeds, seeds, pathogen and other organisms. The supplier will complete the Hygiene Declaration Form (Attachment 1) prior to entry onsite. Completed forms will be kept in the HLW office (or accessible electronically) for audit and compliance tracking purposes. The completed Hygiene Declaration Form will be kept in the relevant

vehicle during transportation and presented at the HLW access point.

A summary of hygiene declaration and inspection outcomes including an evaluation of biosecurity measure effectiveness will be provided in annual reporting.

5.1.2.1. Checkpoints

Checkpoints will be established to carry out visual inspections of plant and equipment to ensure compliance with the Hygiene Declaration Form. Checkpoints will be located at or prior to access points onsite. Where cleanliness standards are not met, site entry will be refused, and thorough off-site wash down at an appropriate facility will be required prior to site access being granted.

5.1.3. Washdown stations

Where incoming and outgoing vehicles, vessels, machinery and equipment do not satisfy the cleanliness requirements of the Hygiene Declaration Form, washdown will be required. Only relevant equipment that is cleaned to the specified standard will be accepted onsite. No incoming rejected plant and equipment will be permitted to washdown using an onsite facility. Commercial car-wash facilities should be used where possible. Council facilities and/or existing facilities may also be used where permission has been granted.

Washdown areas will be located at major access points and HLW compound sites, as permissible with relevant Property Management Plans. In locations of key weed or pathogen outbreaks (restricted areas), vehicle and machinery inspection and washdown will be required upon entering the HLW Area from outside and when leaving restricted areas (refer to Section 5.1.4 of this report). Similarly, vehicle and machinery inspection and washdown will be mandatory for entry into the following no-go zones (refer Annexure B Clearing Protocol of the HLW BMP):

- PCT 637 + 50 m buffer.
- Known *Prasophyllum bagoense*, *Prasophyllum keltonni* and *Pterostylis oreophila*, + 30 m buffer.
- McPhersons Plain + 30 m buffer.

Such facilities will be contained, Transgrid approved, and away from production and other sensitive areas and not drain into waterways. The washdown procedure is detailed in Table 5-1 below.

Table 5-1 Washdown protocol for vehicles and heavy machinery (DPIE, 2020)

Step	Method
Check	• Check the exterior and interior of vehicles and machinery for soil, plant material and other debris.
Clean	• Remove large clods of dirt and soil using a stiff brush or crowbar. • Remove all soil, plant material and other debris from the interior using a vacuum or dustpan and brush. Focus on the cabin floor, floor mats and pedals. • Place debris in a bag and dispose of in a commercial waste bin. • If returning from a potentially-contaminated area, wash vehicle and/or machinery as soon as possible (e.g. at a commercial carwash) before heading back to site. If a carwash facility is not available, spray tyres thoroughly with a disinfectant.
Dry	• Where practical, allow vehicle or machinery to dry before proceeding.

5.1.4. Restricted areas

Weed or pathogen dominated areas identified during the baseline weed survey and soil sampling (Section 5.1.1) will be demarcated and signposted by the Project Ecologist/Contractors during pre-clearing surveys. Weed or pathogen infested areas and weed/pathogen topsoil stockpiles will be demarked as restricted areas. Vehicles or plant that are required to enter the restricted areas will be cleaned at in-situ mobile washdown stations prior to moving to other areas of the site. Temporary washdown stations will be established in weed and pathogen restricted areas as they are identified. Once vehicles or items of mobile plant or equipment are assessed as clean and/or disinfected to the satisfaction of the Weed Hygiene Declaration and/or disinfection record, they will be free to move about the HLW Area.

The demarcated restricted areas will be inspected as part of the weekly environmental inspection by HLWJV to ensure the flagging, signage and washdown areas are in place and functioning.

5.1.5. Predator and pests

There is potential for increased human activity from HLW to result in increased activity of predators and pests; associated with several Key Threatening Processes listed under the BC and EPBC Act (refer to Section 6.3 of the HLW BMP). To minimise the risk of increased predator and pest activity during construction, the following controls will be implemented:

- Food waste will be stored appropriately in fauna-inaccessible bins and disposed off-site.
- No waste will be left outside in open areas accessible to fauna.
- Opportunistic sightings of predator and pest activity will be documented.
- No feeding or interactions with feral horses or any other fauna.
- Staff inductions will include awareness training on:
 - o Avoiding conflict or attraction (e.g., leaving food waste accessible).
 - o Reporting sightings or damage.

5.2. Control

As outlined in Section 6.1.1, baseline weed surveys and soil sampling for potential pathogens will be undertaken prior to the commencement of clearing. With this baseline data, weed and pathogen controls will be outlined for specific locations within the HLW Area. The following sections discuss aspects of the relevant controls that will be implemented for HLW.

5.2.1. Weed control

Recommended controls for known weeds in the HLW Area are detailed in Table 5-2, however methods may be tailored in accordance with legislative (or local control authority) requirements and landowner approval.

Table 5-2 Recommended weed controls

Scientific Name	Common Name	Recommended controls
<i>Carthamus lanatus</i>	Saffron Thistle	• Physical removal. • Weed spraying.
<i>Centaurea solstitialis</i>	St Barnaby's Thistle	
<i>Cirsium arvense</i>	Perennial Thistle	
<i>Cirsium vulgare</i>	Spear Thistle	
<i>Conyza bonariensis</i>	Flaxleaf Fleabane	• Physical removal.
<i>Conyza sumatrensis</i>	Tall Fleabane	

Scientific Name	Common Name	Recommended controls
<i>Echium plantagineum</i>	Patterson's Curse	• Weed spraying.
<i>Echium vulgare</i>	Viper Bugloss	• Weed spraying.
<i>Eragrostis curvula</i>	African Lovegrass	• Physical removal. • Weed spraying.
<i>Hypericum perforatum</i>	St. John's Wort	• Physical removal. • Weed spraying.
<i>Marrubium vulgare</i>	White Horehound	• Physical removal.
<i>Nassella neesiana</i>	Chilean Needle Grass	• Weed spraying.
<i>Onopordum acanthium</i>	Scotch Thistle	
<i>Proboscidea louisianica</i>	Purple-flowered Devil's Claw	
<i>Rosa rubiginosa</i>	Sweet Briar	• Physical removal.
<i>Rubus fruticosus</i> sp. agg.	Blackberry	• Weed spraying. • Cut and paint.
<i>Senecio madagascariensis</i>	Fireweed	• Weed spraying.
<i>Xanthium italicum</i>	Hunter Burr	• Physical removal.
<i>Xanthium occidentale</i>	Noogoora Burr	• Weed spraying.
<i>Xanthium orientale</i>	Californian Burr	
<i>Xanthium spinosum</i>	Bathurst Burr	

5.2.1.1. Physical weed control

Prior to the commencement of clearing, pre-clearing surveys will outline the location of all weeds and weeds to be controlled. Weeds will be controlled by a suitably qualified and experienced contractor. During clearing works, topsoil from areas identified as dominated by weeds will be stockpiled separately from 'clean' topsoil. Weed topsoil stockpiles will be stored in areas exhibiting the same weed presence. Stockpiles will be sign-posted with erosion and sediment controls and prevention controls (Section 5.1) implemented. Stockpiles will also be covered with geofabric, landscape fabric, tarpaulin or sterile cover crop to minimise weed growth. Stockpiles will be monitored and weed control will be undertaken if required, as per Section 5.2.1.2. HLWJV will determine if this topsoil can be reused. If not usable, weed topsoil will be disposed of at an appropriate licenced waste management facility in accordance with the *Biosecurity Act 2015* and *Protection of the Environment Operations Act 1997*, or with Transgrid and landowner approval buried on site.

Weeds are to be physically removed (per Table 5-2) and disposed of at a licenced waste management facility or destroyed in a manner to mitigate against weed spread. All other non-weed materials excavated within a weed risk area can be moved within the boundaries of that same weed risk area but cannot be taken to an area with a different weed risk.

5.2.1.2. Chemical weed control

A weed control contractor will be employed to implement chemical weed control for HLW as the primary means of eradicating or mitigating against the spread of weeds. The weed control contractor will be suitably qualified and experienced in the management and control of weeds, particularly those known to occur in the HLW Area.

At minimum, annual weed control program will take place throughout the construction of HLW. This will generally involve a spring and summer round of weed spraying, the timing of which will be adapted each season to maximise efficacy by targeting the most appropriate life stage of the target species. The precise timing and locations for weed spraying will be determined by the weed control contractor.

Prior to spring, the weed contractor will prepare a tailored weed spraying program which considers the following:

- Weed monitoring results from pre-clearing surveys.
- Seasonal and climatic factors such as flowering/seeding time and susceptibility to different controls (refer weeds of concern listed in Table 3-1).
- Staging of vegetation clearing works, with weeds in areas prioritised for clearing to be controlled as a priority to avoid dispersal of weed plant material.
- Recent bushfire activity.
- Necessity for follow-up spraying.
- Current spraying activities in the HLW Area and surrounds.
- The time and resources available to carry out the weeding program.
- Landowner approvals (if relevant).

Areas subject to traffic and disturbance will have weeds sprayed to reduce the presence of weeds around the HLW Area. This may include access roads, spoil emplacement areas, topsoil areas, areas that support sediment control structures, and other areas (as recommended by the weed contractor). Geo-tracking will be used in weed spraying units to identify which areas have been sprayed.

Topsoil, mulch and spoil stockpiles will be inspected for evidence of weeds on a regular basis as part of routine environmental site inspections. Chemical weed control can be undertaken to eradicate weeds on stockpiles and limit seed and propagule proliferation.

There is a range of herbicide and treatment options available for certain weed species. Where available, herbicide treatments should be selective or at least partially selective. The NSW Weed Wise database in accordance with the Transgrid Schedule of Approved Pesticides will be consulted when determining chemical control options for the treatment of select weed species. Spraying is to be done in consultation with Transgrid, State Forests and relevant landowners. Due consideration and restricted herbicide use will also occur where spraying activity has the potential to affect protected flora and fauna individuals or communities.

No application of aquatic herbicides will occur during construction works.

5.2.1.3. No-go zones

No-go zones are designated areas established to prevent the spread of weeds and pathogens during vegetation clearing and construction activities. Per Annexure B Clearing Protocol of the HLW BMP, these zones will be clearly marked and signposted by the Project Ecologist/Contractors during pre-clearing surveys, ensuring that all personnel are aware of their locations and the restrictions in place. Weed control methods specific to no-go zones are detailed in Table 5-3.

Table 5-3 Specific weed controls for no-go zones

No-go zone	Weed controls
PCT 637 + 50 m buffer	• Weed inspection is to occur every 3 months (quarterly). • Limited to hand-weeding only within 30 m of the no-go zone. • No herbicide use. • Prioritised removal of <i>Cirsium vulgare</i>, <i>Holcus lanatus</i>, <i>Juncus acutus</i>, <i>Eragrostis curvula</i>, <i>Poa annua</i> and <i>Rubus</i> spp.

No-go zone	Weed controls
Known <i>Prasophyllum bagoense</i> , <i>Prasophyllum keltonni</i> and <i>Pterostylis oreophila</i> , + 30 m buffer	- Weed inspection is to occur every 2 weeks (fortnightly). - Limited to hand-weeding only within 5 m of each no-go zone. - No herbicide use. - Prioritised removal of invasive grasses (e.g., <i>Phalaris</i>, <i>Poa annua</i>, <i>Agrostis capillaris</i>).
McPhersons Plain + 30 m buffer	- Weed inspection is to occur every 3 months (quarterly). - Limited to hand-weeding only within 30 m of the no-go zone. - No herbicide use. - Prioritised removal of <i>Cirsium vulgare</i>, <i>Holcus lanatus</i>, <i>Juncus acutus</i>.

5.2.2. Pathogen control

As outlined in Section 5.1.1, baseline soil sampling for potential pathogens will be undertaken prior to the commencement of clearing. Based on the findings of the sampling, specific pathogen controls including restricted areas will be outlined for specific locations within the HLW Area. There is also potential for other pathogens to occur onsite, including Myrtle Rust and Chytrid Fungus. No other pathogens have been identified within the HLW Area to date. Testing for Myrtle Rust and Chytrid Fungus will be undertaken if concerns are raised regarding their potential presence onsite such as sick amphibians or lesions on Myrtaceae.

The prevention measures outlined in Section 5.1 will prevent the spread of any pathogens onsite from potential pathogen infected areas. Primary control methods for Phytophthora and other pathogens (if applicable) are prevention (outlined in Section 5.1), monitoring (outlined in Section 6.1) and adaptive management. If an infestation is identified, onsite controls are to be put in place to prevent its spread. Controls will be based on site-specific risk exposure and may include, but not be limited to, the following:

- Demarcation and signposting of the restricted area to reduce disturbance and control access.
- Establishment of washdown and/or disinfection stations at the access and exit points of the restricted area.
- Utilisation of mobile disinfectant pump packs to address pathogen risk where required.
- Toolbox talk on the restricted area to communicate the risks and new controls in place.
- Review of site activities in the area to determine if activities can be modified to prevent further disturbance to the restricted area. Modification of activities may include rerouted access around the restricted area.
- If works are required in the restricted area, works are to be undertaken during periods of dry soil conditions, wherever practicable.

Table 5-4 and Table 5-5 below show the hygiene protocols adopted from *Hygiene Guidelines; Protocols to protect priority biodiversity in NSW, from amphibian chytrid fungus and other diseases in Australian frogs* (DPIE, 2020). The guidelines promote the adoption of basic hygiene procedures into daily routines when working in the field. Table 5-4 and Table 5-5 of the guidelines (DPIE, 2020) are considered appropriate safeguards for working within the HLW Area.

Table 5-4 Basic hygiene protocol for personnel, clothing, footwear, tools and equipment

Step	Description
Check	Check personnel, clothing, footwear, backpacks and equipment for soil, mud, plant material/propagules (seeds) and other debris.

Clean	- Carry a hard brush and a spray bottle of disinfectant—made up of a solution of 70% ethanol or methylated spirits in 30% water. If you are able to carry more, assemble a simple hygiene kit. - Remove all soil, plant material and other debris from footwear, clothing, gloves and tools using a hard brush before disinfecting. - Disinfect with a solution of 70% ethanol or methylated spirits in 30% water— applied through a spray bottle. - Wash hands with soap and water. Remove seeds from clothing, footwear, tools and equipment by hand. Seeds that are difficult to remove can be scraped off clothing with a sharp implement, but use caution. Have a co-worked double check that you have removed all seeds.
Dry	Ensure hands, clothing, footwear and equipment are dry before proceeding if possible.

Table 5-5 Hygiene protocol for vehicles and heavy machinery

Step	Description
Check	Check the exterior and interior of vehicles and machinery for soil, plant material, seeds and debris.
Clean	- Carry a hard brush and a spray bottle of disinfectant—made up of a solution of 70% ethanol or methylated spirits in 30% water. If you are able to carry more, assemble a simple hygiene kit. - Remove large clods of dirt and soil using a hard brush or crowbar. Pay attention to mudflaps and tyres. - Remove all soil, plant material, seeds and other debris from the interior using a vacuum and/or dustpan and brush. Focus on cabin floors, floor mats and pedals. Place debris in a bag and dispose of in a commercial waste bin. - Use a wash-down facility for vehicles and machinery if available, or wash-down on a hard, well-drained surface, for example a road, and on ramps if possible. - Dispose of wash-down water so that it drains back into a low area of the infested zone away from waterways. If this is not possible, empty it into a waste container for responsible disposal offsite. Don't allow wash-down water to drain into clean bushland. - Don't drive through wash-down water. If a carwash facility is not available, spray tyres thoroughly with a disinfectant.
Dry	Where practical, allow vehicle or machinery to dry before proceeding.

5.2.2.1. Chytrid fungus control measures

To minimise the risk of spreading chytrid fungus (*Batrachochytrium dendrobatidis*), strict quarantine protocols should be implemented for any newly captured or relocated amphibians in accordance with Annexure B Clearing Protocol of the HLW BMP.

5.2.3. Feral Horse control

Impact avoidance and minimisation has been prioritised in the McPhersons Plain area through detailed design measures. The existing horse-exclusion fencing around the central portion, established to protect threatened flora species, will be maintained and designated as a no-go zone per Annexure B Clearing Protocol of the HLW BMP.

The following controls apply to mitigate impacts associated with Feral Horses within the HLW Area:

- The horse-exclusion fencing around the central portion of McPhersons Plain (to prevent impacts to threatened flora species) will be maintained.
- Stock-proof fencing of laydown areas, spoil sites and erosion controls where horse entry may cause damage. Fencing is to include gates that remain closed when not in active use, including signage to inform staff of requirement.

5.3. Disposal

Weeds removed during clearing, as well as weedy vegetative material and weed seed collected in washdown facilities, will be disposed of at a licenced waste management facility in accordance with the *Biosecurity Act 2015* and *Protection of the Environment Operations Act 1997*.

5.4. Biosecurity outbreak

Biosecurity outbreaks occur when unknown or unexpected animal and plant diseases and pests, such as Red Imported Fire Ants (*Solenopsis Invicta*), occur on a site. No known risks of biosecurity outbreaks occur within the HLW Area or surrounds, however outbreaks have potential to occur. This plan will reduce the likelihood of introduction of biosecurity risks, however if unknown pest or pathogens are identified or suspected on-site, all HLW personnel have a responsibility to report to the Environmental Manager or Construction Manager. Suspected sightings and identifications are to be reported to DPI's Invasive Plants and Animals department on 1800 680 244.

If a suspected outbreak is recorded, reasonable action must be taken to isolate the incident. All staff should be notified, and the area contained. For information on current outbreaks in NSW, refer to the [Department of Primary Industries website](#).

5.5. Summary of biosecurity management measures

All biosecurity management measures outlined in this plan have been summarised in Table 5-6 below. These will be implemented to minimise biosecurity impacts from HLW and ensure all commitments and requirements of approval will be adhered to. These specific management and mitigation measures have been developed to address the relevant requirements of applicable legislation, the MCoA, the CoMA, the UMM and all Planning Approval Documentation, particularly the Revised BDAR.

A summary of all management and mitigation measures relevant to the HLW BMP is provided in Section 7.13 of the BMP.

Table 5-6 Biosecurity management and mitigation measures

ID	Measure/Requirement	When to implement	Responsibility	Reference	Evidence
BMP25	Baseline weed surveys will be complete during pre-clearing surveys, including the identification of weed species present, density and location of weeds, and physical demarcation of weed restricted areas	Pre-construction	Environmental Manager Project Ecologist	MCoA B30 UMM B3, B8, B9 and B22	Project Ecologist confirmation Updated sensitive area maps and HLW GIS Pre-clearing Report
BMP26	A soil sampling program be undertaken prior to construction by a suitably qualified person(s) to test for presence/absence of <i>Phytophthora</i> within the HLW Area. Soil sampling will be undertaken within the HLW Area, including key areas such as at vehicle washdown (to ensure that hygiene measures are effective) and around key infrastructure areas and roads where there is movement of vehicles, vessels, plant and machinery.	Pre-construction	Environmental Manager Project Ecologist	MCoA B30 UMM B3, B8, B9 and B22	Soil sampling results

ID	Measure/Requirement	When to implement	Responsibility	Reference	Evidence
BMP27	All suppliers of plant and equipment, HLWJV and contractors will be informed of their general obligation under the <i>Biosecurity Act 2015</i> to prevent the introduction and spread of diseases, weeds and contaminants. The suppliers will be expected to present their materials and equipment clean and free of dirt, mud, seed and biological materials including weeds, seeds, pathogen and other organisms. Suppliers will complete the Hygiene Declaration Form provided in Attachment 1 prior to entry onsite.	Pre-construction and Construction	All staff	MCoA B30 UMM B3, B8, B9 and B22	Hygiene Declaration Form records
BMP28	Hygiene checkpoints will be established at or prior to access points onsite to carry out visual inspections of plant and equipment to ensure compliance with the Hygiene Declaration Form. Where cleanliness standards are not met, site entry will be refused, and thorough off-site wash down at an appropriate facility will be required prior to site access being granted	Pre-construction and Construction	Environmental Manager Construction Manager	MCoA B30 UMM B3, B8, B9 and B22	Site audit records
BMP29	Onsite washdown stations will accompany restricted areas and be contained, Transgrid approved, and away from production and other sensitive areas. Washdown areas will be located at major access points, HLW compound sites and no-go zones, as permissible with relevant Property Management Plans. Washdown procedure detailed in this plan will be followed.	Pre-construction and Construction	Environmental Manager Construction Manager	MCoA B30 UMM B3, B8, B9 and B22	Site audit records

ID	Measure/Requirement	When to implement	Responsibility	Reference	Evidence
BMP30	Restricted areas (i.e., weed/ pathogen dominated areas, weed/ pathogen topsoil stockpiles) will be demarcated and signposted. These areas will be subject to weekly inspection to ensure the flagging, signage and washdown areas are in place and functioning	Pre-construction and Construction	Environmental Manager Construction Manager	MCoA B30 UMM B3, B8, B9 and B22	Site audit records
BMP31	To minimise the risk of increased predator and pest activity, the following controls will be implemented: - The horse-exclusion fencing around the central portion of McPhersons Plain (to prevent impacts to threatened flora species) will be maintained. - Stock-proof fencing of laydown areas, spoil sites and erosion controls where horse entry may cause damage. Fencing is to include gates that remain closed when not in active use, including signage to inform staff of requirement. - No feeding or interactions with feral horses or any other fauna. - Staff inductions will include awareness training on: - Avoiding conflict or attraction (e.g., leaving food waste accessible). - Reporting sightings or damage.	Pre-construction and Construction	All staff	MCoA B30 UMM B3, B8, B9 and B22	Site audit records

ID	Measure/Requirement	When to implement	Responsibility	Reference	Evidence
BMP32	Weed control program within the HLW Area will involve physical and chemical methods as detailed in this plan: • A weed control contractor will be employed to implement chemical weed control for HLW as the primary means of eradicating or mitigating against the spread of weeds. • Topsoil from areas identified as dominated by weeds will be stockpiled separately from 'clean' topsoil. • Appropriate weeds are to be physically removed and disposed of at a licenced waste management facility.	Construction	Environmental Manager Weed Control Contractor Project Ecologist	MCoA B30 UMM B3, B8, B9 and B22	BMP Monitoring Report
BMP33	Annual weed monitoring will be conducted to determine weed cover for the HLW Area, inform the location and extent of controls and monitor cycles of weed growth and novel weed establishment. Annual pathogen monitoring will occur to test for presence/absence of <i>Phytophthora</i> within the HLW Area. Monitoring methods to follow those detailed in this plan.	Construction	Environmental Manager Project Ecologist	MCoA B30 UMM B3, B8, B9 and B22	BMP Monitoring Report
BMP34	All HLW personnel must report suspected emerging weeds, pest or pathogens immediately to the Environmental Manager or Construction Manager. Suspected sightings are to be reported to DPI's Invasive Plants and Animals department on 1800 680 244.	Pre-construction and Construction	All staff Environmental Manager Construction Manager	MCoA B30 UMM B3, B8, B9 and B22	Site audit records

6. Compliance management

6.1. Monitoring and inspection

6.1.1. Baseline weed monitoring

Prior to the commencement of clearing, weeds will be mapped within the HLW Area during pre-clearing surveys. Given the large area of impact associated with HLW, weed mapping may be undertaken on-foot, using drones or using binoculars to assess larger areas from a vantage point. The surveys will include the identification of weed species present, including density and location, and will include the physical demarcation of weed restricted areas. Results of baseline weed monitoring, particularly locations of weed restricted areas, will be used to confirm sensitive area maps and update HLW GIS.

6.1.2. Ongoing weed monitoring

Weed monitoring will continue annually during construction works to determine weed cover for the HLW Area, inform the location and extent of controls and monitor cycles of weed growth and novel weed establishment. For the first monitoring event, it is necessary to install permanent markers (e.g., star picket marked/flagged with monitoring location name) and record the coordinates of each monitoring location in order to relocate for subsequent monitoring events. Monitoring will be conducted via transects as follows:

- A series of transects are to be undertaken within the HLW Area at the following intervals: .
 - o Every 250 m in:
 - Areas with known weed infestations.
 - High-conservation value vegetation (e.g., TECs or SAIL flora species polygons).
 - Within rehabilitated areas per Annexure G Rehabilitation Plan of the HLW BMP.
 - o Every 1,000 m in:
 - Cleared or low-value grazing lands.
 - Low condition, non-sensitive vegetation.
- The line-point intercept method will be used along each transect.
- At each interval, the cover of weed species will be measured, using a straight rod. Any intercepts or “hits” of a weed species on the rod will be recorded as present (with one being the upper limit for each stratum at each point). No intercepts of weed species at each stratum records a zero.
- As data is collected along each transect, the cover (%) of weeds for each stratum (exotic shrubs <1 m, exotic grasses and exotic ground cover) is calculated by dividing the number of hits by the number of transects, then multiplying it by 100.
- As data is collected along each transect, the cover (%) of each stratum of weeds is calculated by determining the average cover at each interval.

6.1.3. Pathogen monitoring

A soil sampling program will be undertaken prior to construction by a suitably qualified person(s) to test for presence/absence of *Phytophthora* within the HLW Area. Soil sampling will be undertaken within the HLW Area at key areas such as access points, vehicle washdown stations (to ensure that hygiene measures are effective) and compounds where there is movement of vehicles, vessels, plant and machinery. Initial sampling to occur during pre-construction to compile baseline data and generate occurrence maps (as determined by results), followed by annual monitoring events during construction.

For each monitoring location, several small sub-samples should be collected and combined into a

single representative sample for that location. The collection of each sub sample will involve:

- Use a sterile garden trowel to scrape away surface leaf litter.
- Dig a small hole, collect a small amount of soil and living plant roots (the hole does not need to be any deeper than 10 cm and you only need 100-250 grams of soil).
- Place combined samples into a new, thick zip-lock plastic bag.
- Label the bag with date, monitoring site code and sample number (e.g., 19/10/2025, AccomCamp1).
- Place into a second bag to prevent cross contamination and as a safeguard against breakage.
- Store soil samples in a cool, dark place and dispatch for analysis as practicable after sampling.
- After each sample, scrub your hands and the trowel thoroughly with methylated spirits to disinfect them and prevent cross-contamination of samples.
- Send samples to a suitable laboratory to analyse for *Phytophthora*. The samples are to be stored in temperatures below 24° C, and with ice bricks that do not directly have contact with the samples.

Monitoring data (laboratory results) for each monitoring location is to be kept in a spreadsheet with additional results added after each monitoring period.

6.2. Incidents and non-compliances

Non-conformances, incident reporting and subsequent investigation will be undertaken as required in accordance with the Trigger Action Response Plan (TARP) provided in Table 6-1 below. HLWJV will promptly advise Transgrid on events that are non-conforming with this plan.

Table 6-1 Biosecurity Management Plan TARP

Objective	Target	Performance indicator	Method of monitoring	Frequency	Trigger	Action/response plan
Minimise spread of weeds	Control weeds identified during baseline monitoring.	Weed densities are decreasing from baseline values.	Ongoing weed monitoring.	Annually (during construction).	Weed density increasing from baseline values.	Continue monitoring and implement weed control measures.
	Identify if previously unrecorded weed species are present and establish weed management measures or investigations.	No new weeds established.	Ongoing weed monitoring.	Annually (during construction).	New weed species/location identified within HLW Area.	Report new weed presence to Transgrid. Develop and implement weed management options to control new weeds. Investigate the source of weed spread and implement improvements to weed management measures. Transgrid will report any new weed presence to NSW DPI, if the species is a Prohibited Matter such as <i>Parthenium hysterophorus</i> .
Prevent spread of pathogens	Identify previously unrecorded <i>Phytophthora</i> presence within	No new records of <i>Phytophthora</i> within HLW Area. No evidence of	Soil monitoring Ongoing weed monitoring.	Annually (during construction).	Soil sample returns a positive result for <i>Phytophthora</i>.	Report new <i>Phytophthora</i> presence to Transgrid. Develop and implement pathogen management options. Investigate the source of pathogen spread

Objective	Target	Performance indicator	Method of monitoring	Frequency	Trigger	Action/response plan
	the HLW Area.	vegetation dieback.			<i>Phytophthora</i> die back identified.	and implement improvements to pathogen management measures.
		No spread of <i>Phytophthora</i> within HLW area.	Implementation of hygiene protocols for vehicles travelling into, through and exiting the any known areas of infestation.	Annually (during construction)	Hygiene protocols not followed correctly.	Re-train workers on hygiene protocols. Review and implement pathogen management options. Ensure vehicles are adequately disinfected. Report new potential <i>Phytophthora</i> location to TransGrid.
Prevent infectious disease impacting amphibians.	Known biosecurity threats to threatened species or populations result from activities in the HLW Area. Loss of amphibian species.	Infection of frogs by amphibian chytrid causing the disease <i>chytridiomycosis</i>	Monitoring of populations. Implementation of specific hygiene protocols for vehicles travelling into, through and exiting the any known areas of infestation.	Annually (during construction)	- Hygiene protocols not followed correctly. - Spread of target disease in amphibian populations (known or unknown source)	Re-train workers on hygiene protocols. Review and implement disease management options relating to amphibian species. Ensure vehicles are adequately disinfected. Report new potential <i>chytridiomycosis</i> location to TransGrid.
Prevent spread of infectious	Known biosecurity threats to threatened	Introduction and establishment of exotic rust fungi	Monitoring of populations. Implementation	Annually (during construction)	Hygiene protocols not followed correctly.	Re-train workers on hygiene protocols. Review and implement pathogen

Objective	Target	Performance indicator	Method of monitoring	Frequency	Trigger	Action/response plan
fungi through HLW.	species or populations result from activities in the HLW Area. Loss of flora or infection of <i>Myrtaceae</i> species.	of the order <i>Pucciniales</i> pathogenic on plants of the family <i>Myrtaceae</i>	of specific hygiene protocols for vehicles travelling into, through and exiting the any known areas of infestation.		- Spread of target disease in amphibian populations (known or unknown source) - Loss of flora with symptoms of <i>Pucciniales</i>.	management options. Ensure vehicles are adequately disinfected. Report new potential <i>Pucciniales</i> location to TransGrid. If possible, prevent further vehicles travelling through known infected location.

6.3. Reporting

6.3.1. Pre-clearing report

Pre-clearing reports will include results from baseline weed monitoring detailed in Section 6.1.1. Pre-clearing reports are to include the following information:

- Weed species identified, including locations (figures) and estimates of density.
- Recommended weed control measures based on confirmed weed species occurrence.
- Locations of weed restricted areas.

6.3.2. Annual report

As stated in the HLW BMP, an annual BMP Monitoring Report will be prepared to document the biosecurity mitigation measures implemented during construction works. This report would include the following matters of relevance to weed and pathogen management:

- Details on the weed control actions undertaken since the last report, including;
 - o A list of the control activities undertaken.
 - o A map of areas where control activities were undertaken.
- A comparative analysis of baseline data.
- The efficacy of the control measures in relation to the objective of minimising weed and pathogen distribution and/or abundance in the HLW Area.
- Recommendations for future control activities.
- A summary of the efficacy of other control measures outlined in this plan and recommendations for revisions to controls.

During construction, any biosecurity issues will be reported to Transgrid immediately.

6.4. Training

All site personnel will undergo site induction training and toolbox talks. Items of relevance to biosecurity that will be covered in training include:

- Identification of weeds on-site.
- Washdown procedures and hygiene standards.
- Any disinfection requirements.

7. References

- Centre for Invasive Species Solutions (CISS). (2021). *Weeds of National Significance*. Centre for Invasive Species Solutions. Retrieved from: <https://weeds.org.au/weeds-profiles/?botanical=Verbascum%20thapsus> abgerufen
- Dickman CR. (1996). *Overview of the impact of feral cats on Australian native fauna*, report to the Australian Nature Conservation Agency, Canberra. Retrieved from: <http://www.deh.gov.au/biodiversity/invasive/publications/cat-impacts/index.html> (Accessed December 2006)
- Department of Planning and Environment – Biodiversity and Conservation Division (DPE-BCD). (2023). *Operational Guidelines for Translocation of Threatened Fauna in NSW*. NSW Government, Sydney. Retrieved from: <https://www.environment.nsw.gov.au>
- Department of Primary Industries [DPI]. (2008). *Weeds of National Significance: National Best Practice Management Manual – Serrated Tussock*. Department of Primary Industries.
- DPI. (2018). *NSW Weed Control Handbook*. NSW Department of Primary Industries: <https://www.dpi.nsw.gov.au/biosecurity/weeds/weed-control/management-guides/noxiousenviro-weed-control> abgerufen
- DPI. (2025). *NSW WeedWise*. NSW Department of Industries. Retrieved from: <https://weeds.dpi.nsw.gov.au/Weeds/OxeyeDaisy#control> abgerufen
- Department of Planning, Industry and Environment (DPIE). (2020). *Hygiene guidelines for wildlife. Protocols to protect priority biodiversity areas in NSW from Phytophthora cinnamomi, myrtle rust, amphibian chytrid fungus and invasive plants*
- LLS (Local Land Services), NSW GOV (2022a). *South East Regional Strategic Weed Management Plan 2023-2027*. South East Local Land Services.
- LLS (Local Land Services), NSW GOV (2022b). *Riverina Regional Strategic Weed Management Plan 2023-2027*. Riverina Local Land Services.
- LLS (Local Land Services), NSW GOV (2024a). *South East Regional Strategic Pest Animal Management Plan 2024-2028*. South East Local Land Services.
- LLS (Local Land Services), NSW GOV (2024b). *Riverina Regional Strategic Pest Animal Management Plan 2024-2028*. Riverina Local Land Services.
- May SA and Norton TW. (1996). *Influence of fragmentation and disturbance on the potential impact of feral predators on native fauna in Australian forest ecosystems*. Wildlife Research 23:387–400.
- Natural Heritage Trust (NHT). (2006). *Introductory Weed Management Manual*. Retrieved from: <https://wildlife.lowecol.com.au/wp-content/uploads/sites/25/Weed-Manual.pdf> abgerufen NPWS. Kosciuszko National Park - Plan of Management. National Parks and Wildlife Service.
- Office of Environment and Heritage (OEH). (2012). *Regional Pest Management Strategy 2012–17, Southern Ranges Region: a new approach for reducing impacts on native species and park neighbours*. Office of Environment and Heritage. Retrieved from: <https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Parks-reserves-and-protected-areas/Pest-management-strategies/regionalpest-management-strategy-southern-ranges-region-120374.pdf>
- OEH. (2014). *NSW Threat Abatement Plan: Infection of amphibians with chytrid fungus resulting in chytridiomycosis*. NSW Government, Sydney. Retrieved from: <https://www.environment.nsw.gov.au/research-and-publications>
- NSW Government. (2022). *Saving our Species program: Amphibian conservation and disease*

management strategies. Department of Climate Change, Energy, the Environment and Water (DCCEEW), Sydney. Retrieved from: <https://www.environment.nsw.gov.au/savingourspecies>

PlantNET. (2025). *National Herbarium of NSW*. Retrieved from: <https://plantnet.rbgsyd.nsw.gov.au/abgerufen>

Wildlife Health Australia (WHA). (2021). *Chytridiomycosis – National Disease Information Summary*. Retrieved from: <https://www.wildlifehealthaustralia.com.au/>

Snowy Hydro. (2023). *Snowy 2.0 Threatened Fish Management Plan*. Retrieved from: <https://www.snowyhydro.com.au/snowy-20/documents/>

Attachment 1 Weed and Pathogen Hygiene Declaration Record

Appendix A - Biosecurity Form

- This form is for use when entering a property that has been declared an emergency zone under the Biosecurity Act 2015.
 - Please refer to the Biosecurity Procedure for more information.
- For any assistance with completing this form, please contact the Senior Environment and Sustainability Manager.

Section 1. Details of Work

Work Dates

Transmission Line/Structure No.

Is the work urgent (operational importance)? If so, explain why

Description of Proposed Work

Section 2. Biosecurity Information

Reason for the Emergency Zone

Conditions of the Emergency Zone

Is access allowed? Will an approved permit be required from the government?

Is access allowed? Will an approved permit be required from the government?

Section 3. Property owners/stakeholders

Name	Contact details	Details of any known property owner/stakeholder requirements

Section 4. Preparation of the Biosecurity Form

Prepared by:		Signature:	
Position Title:		Date	

Section 5. Approval of the Biosecurity Form

Approved by:		Signature:	
Position Title:		Date:	

Appendix B - Hygiene Check – Digital form



Hygiene Check

Single Submission

Scan this QR code to submit forms via the Sitemate app



Link: sitemate.id/s7ccst

It's easy to use

- 1 Scan the QR code using your phone or tablet camera
- 2 Install the Sitemate app and login (or sign up to create your Sitemate ID)
- 3 Go to the Forms tab, then tap the green button
- 4 Enter the link above to start submitting forms

Appendix C – Hygiene Check – Paper form

Hygiene Check – Utility Vehicle

SECTION A - Information

Project / Site			
Property Owner			
Location			
Date	Click here to enter a date.	Name	
Vehicle / Plant Type / Registration No.	Choose an item.		
Driver / Operator			
Travelling / Delivered from			
Travelling / Delivered to			

SECTION B – Hygiene Log

A) Does the Property have a specific Biosecurity Management Plan or are there known Biosecurity Risks*? If Yes, prior to entry you <u>must</u> contact the Property owner to verify you can comply with the Biosecurity Management Plan. If you cannot comply contact your Environmental Business Partner	☐ YES	☐ NO
B) Does the Property Owner &/or work location require any specific Biosecurity measures/protocols to be undertaken prior to entry/exit?	☐ YES	☐ NO
If Yes to a) or b) detail requirements:		
C) Is the vehicle clean & have any specific requirements identified in a) or b) been addressed? (i.e. free of all mud, seed, vegetative material, bio-security risks such as insects, animals, nests, etc) A Hygiene Check (Section C) must be completed.	☐ YES	☐ NO
If No to C) what remedial action has been carried out. ☐ onsite wash-down / disinfection prior to entry ☐ offsite wash-down / disinfection prior to entry, ☐ entry not undertaken ☐ Other:		

*known Biosecurity Risk includes areas/locations where a specific weed or pathogen is known to occur or where the stakeholder/property owner requests specific Biosecurity Protocols are followed.

Section C Hygiene Check - Light Vehicles & Trucks / Trailers ☐ YES Clean ☐ NO Not Clean							
Floor Wells / Mats	☐ YES	☐ NO	☐ NA	Mud Flaps	☐ YES	☐ NO	☐ NA
Engine Bay	☐ YES	☐ NO	☐ NA	Rims	☐ YES	☐ NO	☐ NA
Grill / Radiator	☐ YES	☐ NO	☐ NA	Side Steps	☐ YES	☐ NO	☐ NA
Bonnet recess	☐ YES	☐ NO	☐ NA	Underbody	☐ YES	☐ NO	☐ NA
Wheels / Spares	☐ YES	☐ NO	☐ NA	Suspension	☐ YES	☐ NO	☐ NA
Wheel arches	☐ YES	☐ NO	☐ NA	Tool Boxes	☐ YES	☐ NO	☐ NA
Tray	☐ YES	☐ NO	☐ NA	Other	☐ YES	☐ NO	☐ NA

SECTION D– Verification (I the undersigned declare that the information that I have provided is true & correct)			
Name			
Signature		Date	
Date			

*Declaration must be signed & dated prior to Site entry.

Appendix D Hygiene Check – Mobile Plant

Hygiene Check – Mobile Plant			
SECTION A - Information			
Project / Site			
Location			
Date	Click here to enter a date.	Name	
Vehicle / Plant Type	Choose an item.		
Vehicle / Plant Number / Registration No.			
Driver / Operator / Supplier			
Travelling / Delivered from			
Travelling / Delivered to			
SECTION B – Hygiene Log			
A) Does the Property have a specific Biosecurity Management Plan or are there known Biosecurity Risks*? If Yes, prior to entry you <u>must</u> contact the Property owner to verify you can comply with the Biosecurity Management Plan. If you cannot comply contact your Environmental Business Partner		☐ YES	☐ NO
B) Does the Property Owner &/or work location require any specific Biosecurity measures/protocols to be undertaken prior to entry/exit?		☐ YES	☐ NO
If Yes to a) or b) detail requirements:			
C) Is the vehicle clean & have any specific requirements identified in a) or b) been addressed? (i.e. free of all mud, seed, vegetative material, bio-security risks such as insects, animals, nests, etc) A Hygiene Check (Section C) must be completed.		☐ YES	☐ NO
If No to C) what remedial action has been carried out. ☐ onsite wash-down / disinfection prior to entry ☐ offsite wash-down / disinfection prior to entry, ☐ entry not undertaken ☐ Other:			

*known Biosecurity Risk includes areas/locations where a specific weed or pathogen is known to occur or where the stakeholder/property owner requests specific Biosecurity Protocols are followed.

Section C Hygiene Check - Mobile Plant				☐ bulldozer, ☐ excavator, ☐ roller, ☐ loader, ☐ grader, ☐ crane, ☐ EWP, ☐ mulcher / slasher, ☐ bobcat / skid steer, ☐ mulcher / slasher ☐ Moxi								
Interior / Cabin												
Foot well / interior	☐ YES	☐ NO	☐ NA	Floor mats	☐ YES	☐ NO	☐ NA	Ladder / Steps	☐ YES	☐ NO	☐ NA	
Body / Booms / Engine Bay												
Engine Bay	☐ YES	☐ NO	☐ NA	Chassis / Frames	☐ YES	☐ NO	☐ NA	Grill / Radiator	☐ YES	☐ NO	☐ NA	
Rams/Hoses	☐ YES	☐ NO	☐ NA	Booms	☐ YES	☐ NO	☐ NA	Counterweights	☐ YES	☐ NO	☐ NA	
Tracks, Rollers, Drums, Tyres												
Guards / wheel arches / tyres	☐ YES	☐ NO	☐ NA	Frames	☐ YES	☐ NO	☐ NA	Tracks / Rollers	☐ YES	☐ NO	☐ NA	
Buckets, Blades, Rippers, Augers												
Blades / tines	☐ YES	☐ NO	☐ NA	Buckets	☐ YES	☐ NO	☐ NA	Augers	☐ YES	☐ NO	☐ NA	
Mulcher / slasher	☐ YES	☐ NO	☐ NA	Other					☐ YES	☐ NO	☐ NA	
SECTION D– Declaration of Remedial Actions*												
(I the undersigned declare that the information that I have provided is true and correct)												
Have remedial actions been undertaken (if required)?									☐ YES	☐ NO	☐ NA	
Name												
Signature								Date				
Date												

*Declaration must be signed and dated prior to Site entry.

Annexure F

Connectivity Strategy

HumeLink West

Document Number: HLW-HLJV-PRW-ENM-PLN-000001F

Revision: 7

TransGrid
Date 22/05/2026

Document Control

Approvals

Title	HumeLink West Connectivity Strategy
Endorsed by Environment Representative	Derek Low (Wolfpeak Group Ltd Pty)
Approved on behalf of HLWJV by	Tim Burns
Signed	
Dated	

Version Control

Revision	Date	Description	Approval
A	26/03/2024	Preliminary draft	Jim Maniord
B	30/05/2024	Updated format and structure	Jim Maniord
C	3/07/2024	Updates following receipt of UMMs and HLW mapping files	Paul Dudding
D	19/08/2024	Update following TG review	Paul Dudding
1	14/03/2025	Updates following receipt of final MCoA & CoMA	Tim Burns
2	4/06/2025	Updates following ER, FCNSW & CPHR review	Tim Burns
3	28/07/2025	Updates following ER & CPHR review	Tim Burns
4	30/07/2025	Updates from Client to achieve consistency across project	Tim Burns
5	08/08/2025	Updates following CPHR review	Tim Burns
6	12/08/2025	Updates following CPHR review	Tim Burns
7	22/05/2026	Minor update to reference Conductor Line-Marking Plan (s4.6)	Tim Burns

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The document is uncontrolled when printed. One controlled hard copy of the CEMP and supporting documentation will be maintained by the Quality Manager at the HLW office (and on the HumeLink website link to be provided).

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Abbreviations

Abbreviation	Expanded text
BC Act	<i>Biodiversity Conservation Act 2016 (NSW)</i>
BCS	Biodiversity Conservation and Science group within DCCEEWS – NSW (now referred to as CPHR)
BDAR	Biodiversity Development Assessment Report
BMP	Biodiversity Management Sub-plan
CEMP	Construction Environmental Management Plan
CoMA	Commonwealth Conditions of Ministerial Approval
CPHR	Conservation Programs, Heritage & Regulation (formerly BCS) group within DCCEEWS - NSW
Cth	Commonwealth of Australia
DAWE	Department of Agriculture, Water and the Environment
DBH	Diameter at Breast Height
DCCEEWS - Cth	The Commonwealth Department of Climate Change, Energy, the Environment and Water
DCCEEWS – NSW ¹	The NSW Department of Climate Change, Energy, the Environment and Water (formerly DPE)
DPE	Department of Planning and Environment (now known as NSW DCCEEWS)
DPI	Department of Primary Industries
DPIE	Department of Planning, Industry and Environment (now known as NSW DCCEEWS)
DPHI	Department of Planning, Housing and Infrastructure
ECZ	Easement clearing zone
EIS	Environmental Impact Statement
EPBC Act	<i>Environmental Protection and Biodiversity Conservation Act 1999 (Cth)</i>
FCNSW	Forestry Corporation New South Wales
GDE	Groundwater Dependent Ecosystems
GIS	Geographic Information System
GPS	Global Positioning System
HLW	The HumeLink West Stage of the HumeLink project
HLWJV	HumeLink West Joint Venture (UGL Limited and CPB Contractors)
HLW Area	Areas within and adjacent to the approved disturbance footprint of the

¹ As of the 1st January 2024 the NSW Department of Planning and Environment has split into the Department of Climate Change, Energy, the Environment and Water (NSW) and the Department of Planning, Housing and Infrastructure. DCCEEWS (NSW) includes the environmental regulators (such as NSW EPA, BCS, NPWS, DPE-Water), while the Department of Planning, Housing and Infrastructure (DPHI) includes planning regulatory services.

Abbreviation	Expanded text
	HumeLink West Stage of the HumeLink project
HTZ	Hazard Tree Zone
KFH	Key Fish Habitat
MCoA	NSW Minister's Conditions of Approval
NPWS	NPWS
NSW	New South Wales
PCT	Plant Community Type
Project	HumeLink West
Revised BDAR	<i>HumeLink Biodiversity Development Assessment Report Rev 0</i> (Niche Environment and Heritage Pty Ltd, June 2024)
RPS	RPS AAP Consulting Pty Ltd
SAII	Serious And Irreversible Impact
TARP	Trigger Action Response Plan
TCZ	Total Clearing Zone
TEC	Threatened Ecological Community
UMM	Updated Environmental Management Measure as outlined in the Planning Approvals Documentation

1. Introduction

1.1. Context

This Connectivity Strategy (the strategy) forms part of the Biodiversity Management Sub-plan (BMP) of the HumeLink West project (HLW) Construction Environmental Management Plan (CEMP). This strategy has been prepared to outline and describe how the UGL Limited and CPB Contractors Joint Venture (HLWJV), during the construction of HLW, will comply with the Minister's Conditions of Approval (MCoA), the Federal Minister for Water and Environment Condition of Ministerial Approval (CoMA), the Updated Management Measures (UMM), and undertake its duties in accordance with the Planning Approval Documentation listed under the MCoA.

1.2. Purpose

This strategy has been developed based on current best practices to minimise and manage the potential fauna connectivity impacts as a result of HLW. The proposed management measures aim to address relevant actions and mitigation measures outlined in the following documents:

- Updated mitigation measures B3, B6, B10, B11 and B28 of the *HumeLink Revised Biodiversity Development Assessment Report Rev 0* (Revised BDAR; Niche Environment and Heritage Pty Ltd, June 2024).
- Condition B25 and B30 of the Minister's Conditions of Approval (MCoA) A2.
- Condition 2 and 7 of the Federal Minister for Water and Environment Condition of Ministerial Approval (CoMA).

In areas of natural habitat, powerline easements directly replace habitat formerly available to wildlife and disrupt ecological processes, such as predation and animal movements. Altered patterns of species abundance and species composition have also been reported at the edges of habitat fragments (Stevens et al., 2008). Powerline easements remove and periodically suppress vegetation within the vicinity of the powerline to protect the power supply and reduce bushfire risk. This can cause significant ecological impacts by fragmenting habitats and vegetation communities, providing a physical habitat division, barrier to movement and altering species interactions. These impacts are particularly important for gene flow and long-term population viability through reduced dispersal opportunities and loss of metapopulation structure. Aerial species such as birds and bats that fly at heights where transmission lines are located also have a high potential for collision and may be at risk of midair collisions during stringing activities.

1.3. Objective

This strategy's objective is to design the implementation of mitigation measures to ensure fauna corridors and habitat connectivity are maintained across the HLW transmission easement, in line with the UMMs. The scope of this strategy includes:

- Specifying existing habitat connectivity condition, proposed impacts on such features, and identifying connectivity and fauna movement corridors.
- Identifying the entities that require habitat connectivity and collision-risk mitigation measures.
- Identifying proposed mitigation measures to address prescribed impacts associated with habitat connectivity impaired or severed as a result of HLW. This includes retention of connectivity along the HLW alignment and establishment of connectivity corridors as identified through the process set out in section 4 - 4.5.
- Detailing the desktop and field investigations required to identify the location of connectivity corridors.
- Adopting project design elements that minimise interactions with threatened entities such as conductor line-markers as fauna deterrents.

- Detailing compliance management measures and procedures.
- Outlining a monitoring program to assess the efficacy of connectivity mitigation measures.
- Prescribing threshold triggers for the implementation of adaptive management measures.

2. Environmental requirements

2.1. Relevant documents and guidelines

The main document relevant to this strategy is the Transgrid Connectivity Review Letter (July, 2025) which reviewed the species associated with the connectivity corridors identified in Table A24-10 of the *HumeLink Biodiversity Development Assessment Report Rev 0* (Revised BDAR; Niche Environment and Heritage Pty Ltd, June 2024). Five additional corridors were added for inclusion in this review in the cleared landscapes in the Batlow area. The Transgrid Connectivity Review Letter (July, 2025) involved a desk-based spatial analysis to assess:

- Associations between the connectivity corridors and the distribution of relevant threatened species susceptible to habitat fragmentation because of the Project based on the Revised BDAR Species Polygons and Bionet Atlas records from the past 20 years.
- The level of existing habitat connectivity was visually assessed using aerial photography, vegetation cover and classified as:
 - Key riparian crossing
 - Intact vegetation corridor
 - Fragmented vegetation corridor
 - Non-functional corridor (parallel transmission lines)
 - Non-functional corridor (plantation).
- The risk of impacts to connectivity from the approved development footprint was also visually assessed using aerial photography, vegetation cover and classified as:
 - Connectivity maintained – continuous areas of vegetation retained within the corridor
 - Minor impact – limited clearing, such as access tracks, while functional connectivity maintained
 - Moderate impact – partial clearing, while some connectivity likely to persist between patches on each side of the corridor
 - High impact – extensive clearing, majority of vegetation in corridor impacted and connectivity severed.

The conclusions of the Transgrid Connectivity Review Letter (July, 2025) will be reviewed based on the Final Layout Plans and Field Surveys (Section 0) and documented in the Glider Inspection Report (Section 4.5.3) in consultation with CPHR.

This Strategy has been prepared in accordance with the Environmental Management Plan Guidelines (DCCEEW Cth, 2024).

2.2. Permits and licences

The permits and licences relevant to this strategy include:

- All HLW Ecologists must, at a minimum, hold a Scientific Licence under Part 2 of the *Biodiversity Conservation Act 2016* (BC Act), including Animal Ethics Approval, for fauna handling, rescue and all additional survey works.
- Where rescued fauna requires rehabilitation and care, only wildlife rehabilitation centres authorised under Part 2 of the BC Act may be utilised.
- Clearing works to be managed and monitored using internal HLWJV Clearing Permits.

2.3. Preparation of this strategy

In accordance with MCoA B30a, this strategy has been prepared by suitably qualified and experienced

biodiversity experts of RPS AAP Consulting Pty Ltd:

- Polina Zadorojnaya (BSc; BAM Accredited Assessor BAAS 23014).
- Tara Boreham (BSc; BAM Accredited Assessor BAAS 23039).

2.4. Consultation

This strategy was prepared incorporating technical advice provided by Dr Rodney van der Ree, Technical Executive – Ecology, WSP.

All additional consultation undertaken in preparation of this strategy is summarised in Section 4 and Annexure J: Consultation Report of the HLW BMP. If consultation with relevant stakeholders or regulators is required to assess the efficacy of mitigation strategies detailed in this report, these will be undertaken in accordance with Section 8.3 of the HLW BMP.

2.5. Minister's Conditions of Approval

The MCoA relevant to this strategy are listed in Table 2-1. A cross reference is also included to indicate where and how the conditions are addressed in this strategy or other HLW management documents.

Table 2-1 MCoA relevant to this strategy

MCoA No.	Condition Requirements	Document Reference
Restrictions 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	Not addressed in this strategy – refer to the HLW BMP, including Annexure B: Clearing Protocol.
	(b) minimise: (i) The impacts of the development on hollow-bearing trees. (ii) The impacts of the development on threatened flora and fauna populations. (iii) The clearing of native vegetation and key habitat.	This strategy includes provisions for minimising connectivity (Section 4) and collision (Section 4.4) impacts on fauna populations, as well as minimising the clearing of native vegetation and key habitats in connectivity corridors (Section 4.2.1.2).
	(c) not undertake any works that result in ground disturbance within a minimum setback distance of 50 metres from PCT 637 – Alpine and sub-alpine peatlands, damp herbfields and fens, South Eastern Highlands Bioregion and Australian Alps Bioregion and 30 metres from known locations of <i>Prasophyllum bagoense</i> , <i>Prasophyllum keltonii</i> and <i>Pterostylis oreophila</i> as mapped in the BDAR.	Not addressed in this strategy – refer to the HLW BMP, including Annexure B: Clearing Protocol.
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	This strategy forms part of the HLW BMP.

MCoA No.	Condition Requirements	Document Reference
	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:	
	(a) be prepared by a suitably qualified and experienced biodiversity expert/s;	Section 2.3 and 2.4.
	(b) be prepared in consultation with CPHR and FCNSW;	Section 2.4.
	(c) be prepared generally in accordance with the <i>Revised Biodiversity Development Assessment Report</i> (Revision 0, dated 21 June 2024);	Section 2.1 and Table 2-3.
	(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;	Not addressed in this strategy – refer to HLW BMP.
	(ii) minimising: - the amount of vegetation clearing on site; - the loss of key fauna habitat (including tree hollows); - the impacts of fauna on site, including undertaking pre-clearance surveys; and - potential indirect impacts on threatened flora and fauna species;	This strategy includes provisions for minimising connectivity (Section 4) and collision (Section 4.4) impacts on fauna populations, as well as minimising the clearing of native vegetation and fauna habitat within connectivity corridors (Section 4.2.1.2).
	(iii) ensuring the development does not adversely affect the native vegetation and habitat outside the disturbance footprint;	Not addressed in this strategy – refer Annexure B: Clearing Protocol of the HLW BMP.
	(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	Not addressed in this strategy – refer to Annexure D: Unexpected Finds Procedure of the HLW BMP.

MCoA No.	Condition Requirements	Document Reference
	- notification to the Planning Secretary and CPHR (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;	
	(v) connectivity strategy for the potentially impacted species identified in the Revised Biodiversity Development Assessment Report (Revision 0, dated 21 June 2024) and a Supplementary Hollow and Nest Strategy;	This strategy addresses the requirement for a connectivity strategy. Refer to Annexure C: Hollow and Nest Strategy of the HLW BMP.
	(vi) protecting the conservation values of McPhersons Plain and avoiding impacts to Prasophyllum bagoensis, Prasophyllum keltonni and Pterostylis oreophila;	Not addressed in this strategy – refer Annexure G: Rehabilitation Plan of the HLW BMP.
	(vii) rehabilitating temporary disturbance areas to facilitate natural regeneration of suitable native species;	Not addressed in this strategy – refer Annexure H: Biodiversity Monitoring Program of the HLW BMP.
	(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;	Not addressed in this strategy – refer Annexure H: Biodiversity Monitoring Program of the HLW BMP.
	(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;	This strategy includes provisions for the reuse of salvaged resources within connectivity corridors (Section 4.2.1.2) Refer to Annexure G: Rehabilitation Plan of the HLW BMP for additional measures to address this condition.

MCoA No.	Condition Requirements	Document Reference
	(x) collecting and propagating seed (where relevant);	Not addressed in this strategy – refer Annexure G: Rehabilitation Plan of the HLW BMP.
	(xi) controlling erosion, weeds and feral pests;	Not addressed in this strategy – refer to Annexure G: Rehabilitation Plan of the HLW BMP.
	(xii) bushfire management;	Not addressed in this strategy – refer to Annexure E: Biosecurity Management Plan of the HLW BMP.
	(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	This strategy includes provisions for minimising collision risk for the Sooty Owl (Section 4.4).
	(e) be prepared in consultation with CPHR and FCNSW.	Section 5.
	Following the Planning Secretary's approval, the Proponent must implement the Biodiversity Management Plan. <i>Note: The Biodiversity Management Plan must incorporate all relevant aspects of the development, including Enabling Works consistent with the requirements of condition B67.</i>	Noted.

2.6. Federal Minister for Water and Environment Condition of Ministerial Approval

The CoMA relevant to this strategy are listed in Table 2-2. A cross reference is also included to indicate where and how the conditions are addressed in this strategy or other HLW management documents.

Table 2-2 CoMA relevant to this strategy

CoMA No.	Condition Requirements	Document Reference
Clearing Limits		
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.	Refer Table 2-1.
Biodiversity Management Plan		
7	The approval holder must comply with condition B30 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.	Refer Table 2-1.

2.7. Environmental Management Measures

UMMs relevant to this strategy are listed in Table 2-3 below. A cross reference is also included to indicate where and how the conditions are addressed in this strategy or other HLW management documents.

Table 2-3 UMMs relevant to this strategy

UMM No.	Condition Requirements	HLW Stage	Applicable location(s)	Document Reference
Biodiversity				
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	Detailed design and construction	All locations	This strategy forms part of the HLW BMP.

UMM No.	Condition Requirements	HLW Stage	Applicable location(s)	Document Reference
	mitigation measures outlined in Technical Report 1 – Revised Biodiversity Development Assessment Report, including:			
	Measures to minimise impacts to biodiversity, 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.			This strategy includes provisions for minimising connectivity (Section 4) and collision (Section 4.4) impacts on fauna populations, as well as minimising the clearing of native vegetation and fauna habitat within connectivity corridors (Section 4.2.1.2).
	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.			Not addressed in this strategy – refer Annexure B: Clearing Protocol of the HLW BMP.
	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 bushrock) identified in <i>Technical Report 1 – Revised Biodiversity Development Assessment Report</i> and/or pre-clearing inspection. Including procedures to record the effort and outcomes of the habitat removal process.			

UMM No.	Condition Requirements	HLW Stage	Applicable location(s)	Document Reference
	Retention of habitat features such as rocky outcrops, surface rock, dead wood, logs, wherever practicable.			This strategy includes provisions for the retention of habitat features within connectivity corridors (Section 4.2.1.2) Refer to Annexure G: Rehabilitation Plan of the HLW BMP for additional measures to address this condition.
	Proposed rehabilitation of temporary disturbance areas including management and maintenance measures.			Not addressed in this strategy – refer Annexure G: Rehabilitation Plan of the HLW BMP.
	Unexpected species finds protocol to be implemented if threatened ecological communities, flora and fauna species, not assessed in <i>Technical Report 1 – Revised Biodiversity Development Assessment Report</i>, are encountered during pre-clearing inspections.			Not addressed in this strategy – refer Annexure D: Unexpected Finds Procedure of the HLW BMP.
	A description of biosecurity protocols for plant and equipment movement between sites, including species specific measures.			Not addressed in this strategy – refer Annexure E: Biosecurity Management Plan of the HLW BMP.
	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.			Section 4.4, refer to HLW BMP for additional information.

UMM No.	Condition Requirements	HLW Stage	Applicable location(s)	Document Reference
	Outline monitoring and compliance management requirements.			Section 5
	Approach to relocation of nests by suitably qualified ecologist where found within construction work sites (ie 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.			Not addressed in this strategy – refer Annexure C: Hollow and Nest Strategy of the HLW BMP.
	Details on the pre-clearing and clearing supervision process.			Not addressed in this strategy – refer Annexure B: Clearing Protocol of the HLW BMP.
	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.			Not addressed in this strategy – refer Section 7.7 of the HLW BMP.
	Procedures for reporting the outcomes of pre-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 (eg 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.			Not addressed in this strategy – refer Annexure G: Rehabilitation Plan of

UMM No.	Condition Requirements	HLW Stage	Applicable location(s)	Document Reference
	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 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.			the HLW BMP. Not addressed in this strategy – refer Annexure H: Biodiversity Monitoring Program of the HLW BMP.
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	Detailed design	Where SAI candidate species considered likely to	Section 4.1. Refer to HLW BMP for additional measures.

UMM No.	Condition Requirements	HLW Stage	Applicable location(s)	Document Reference
	be prioritised for avoidance incorporating consideration of connectivity between retained remnants within and adjacent to the amended project footprint must be considered in the connectivity strategy.		result in SAI are mapped	
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 <i>Technical Report 1 – Revised Biodiversity Development Assessment Report</i> . 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:	Detailed design and construction	Transmission line corridor at strategic locations (as identified in <i>Technical Report 1 - Revised Biodiversity Development Assessment Report; Attachment 24, Figure 13-2</i>)	This strategy has been developed to address this condition.
	key riparian crossings			Section 4.2.1.3
	areas of the transmission line joining proposed biodiversity stewardship sites (ie Donna Valley Biodiversity Stewardship Site) and/or conservation reserve estate (ie Tarlo River National Park, Bango Nature Reserve, Mudjarn Nature Reserve and Minjary National Park)			Section 4.2.1.3 Tarlo River National Park, Bango Nature Reserve, Mudjarn Nature Reserve and Minjary National Park are relevant to HumeLink East only and have therefore been excluded from the HLW BMP.
	transmission line structure locations that occur in woodland vegetation at strategic locations (ie vegetation corridors with moderate to high landscape connectivity, and with moderate to high levels of fauna activity/ movement).			Section 4.2.1.3

UMM No.	Condition Requirements	HLW Stage	Applicable location(s)	Document Reference
	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 (ie 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).			Section 4.2.1
B11	Conductor line-marking techniques will be considered at specific locations identified in <i>Technical Report 1 – Revised Biodiversity Development Assessment Report</i> during design refinement to minimise bird strike. 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, Attachment 24</i>) 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.	Detailed design	Transmission line corridor – at sites recommended for specific corridors (as identified in <i>Technical Report 1 – Revised Biodiversity Development Assessment Report; Attachment 24</i>)	Section 4.4.1

UMM No.	Condition Requirements	HLW Stage	Applicable location(s)	Document Reference
B28	Micro-siting of infrastructure requiring sub-surface work, such as transmission line structure footings and access tracks, will be undertaken as part of 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 (ie 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.	Detailed design and construction	Transmission line corridor, construction compounds, accommodation facilities	Section 4.1 and 4.2.1.2. Refer to HLW BMP for additional measures.

3. Background

3.1. Impacts

HLW will involve the establishment of an approximately 151 km long transmission line supported by a series of free-standing lattice structures that would range between 50-76 m in height, spaced between 300-600 m apart. The HLW easements will typically be 70 m wide, however a number of locations may require wider easements of up to 130 m. There are numerous locations where the easement will run parallel to the existing Line 64 and Line 66 easements. This will result in a worsening of existing fragmentation, resulting in a total easement width of 180-200 m wide.

The *HumeLink Vegetation Clearing Method and Management Memorandum* (Rev 1; Transgrid, 2023) was prepared to describe the vegetation clearing methodology proposed for the construction and operation of HLW, as replicated below.

The HLWJV clearing protocol has been developed to consider several 'disturbance zones' to accommodate the various specific clearing requirements of the construction and operational maintenance phases. These zones are described with respect to construction clearing/management requirements and methodology. The zones are summarised below with respect to connectivity. Indicative displays are provided in Plate 3-1 through Plate 3-4.

1. **Total Clearing Zone (TCZ)** – complete clearing of vegetation. Includes transmission line structures, access tracks, substations and telecommunications connections and construction ancillary facilities. Complete clearing of all vegetation.
2. **Easement Clearing Zone (ECZ)** – partial clearing of vegetation to accommodate 500 kV transmission lines at maximum line operating conditions. This includes:
 - a. Clearing of all trees (i.e., trees of a sufficient height which, if they were to fall, would strike the overhead conductors or the transmission line structures, or come close enough to result in electrical flashover).
 - b. Retention of mid and understorey vegetation (excluding trees) with a mature height up to 5.6 m.
 - c. Manual methods used in areas of very high ecological sensitivity (e.g., where endangered orchids are present).
3. **Hazard Tree Zone (HTZ)** – partial clearing. Removal of trees outside of the easement which, if they were to fall, would strike the overhead conductors or the transmission line structures or come close enough to cause electrical flashover and infringe on the VCR at maximum conductor sag. These hazard trees pose a potential bushfire risk, risk to the asset, and require management/removal as part of construction. Clearing works will be managed to minimise impacts to mid and understorey vegetation.

Given the scale and linear nature of HLW, the use of habitat 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.

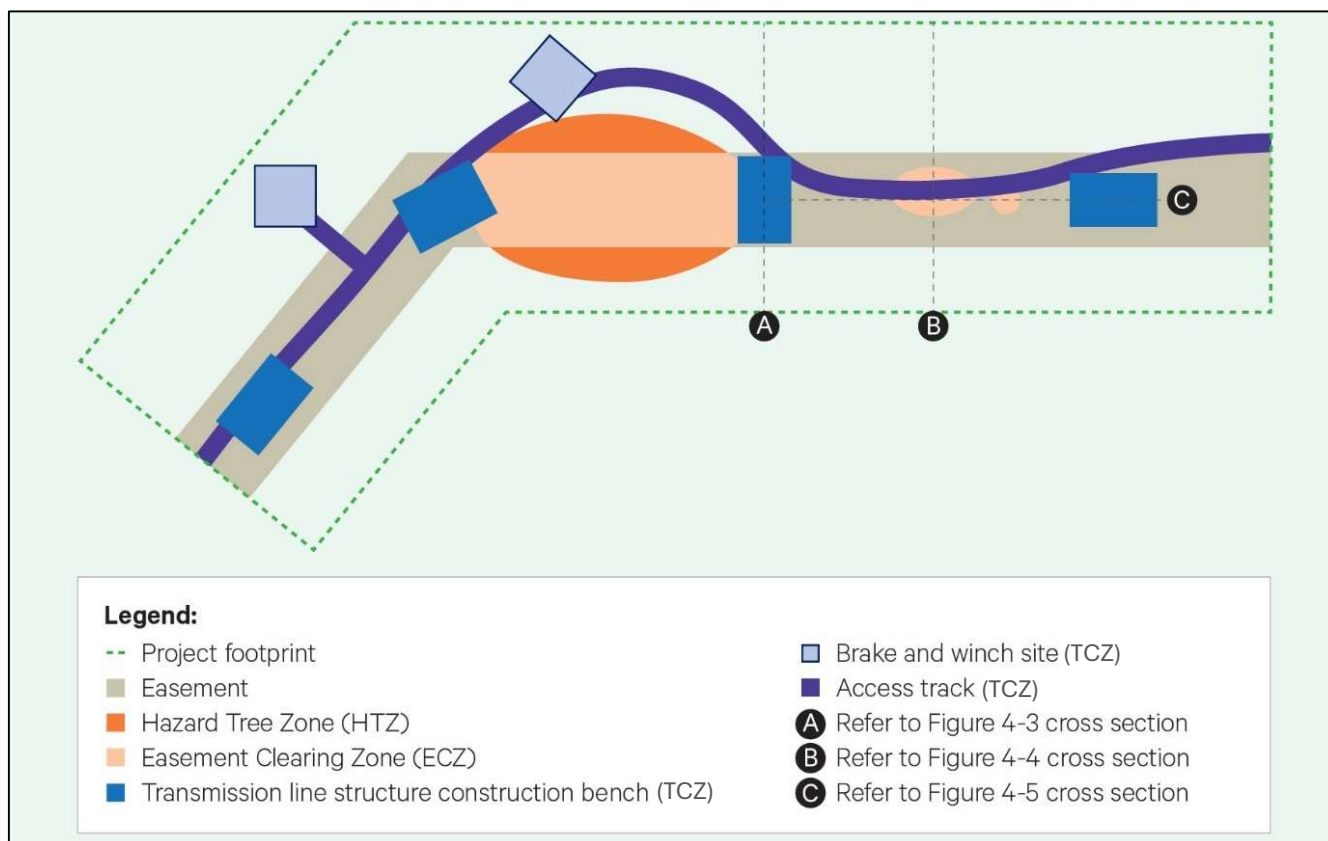


Plate 3-1 Indicative disturbance zones

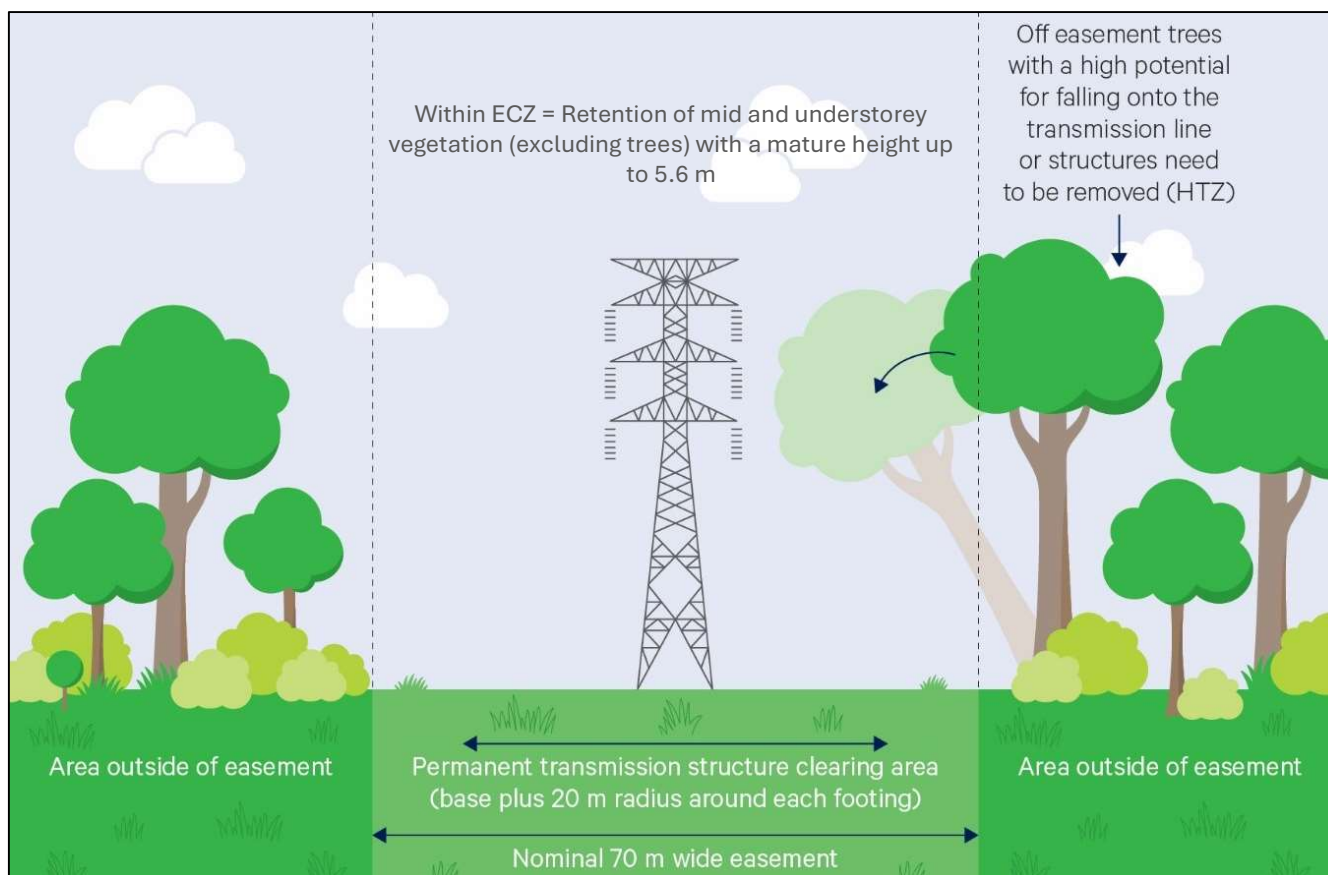


Plate 3-2 Indicative vegetation clearing around a typical transmission line structure

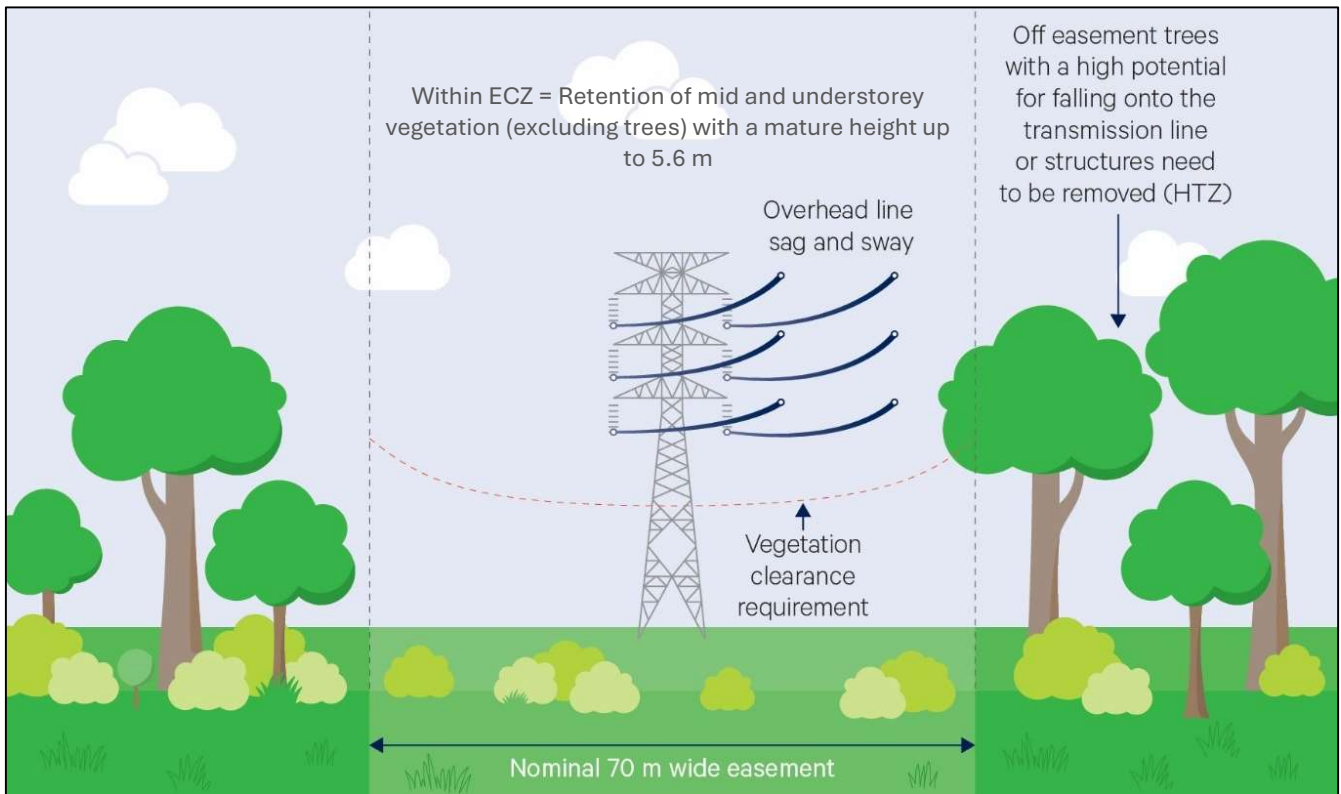


Plate 3-3 Indicative vegetation clearing within the easement

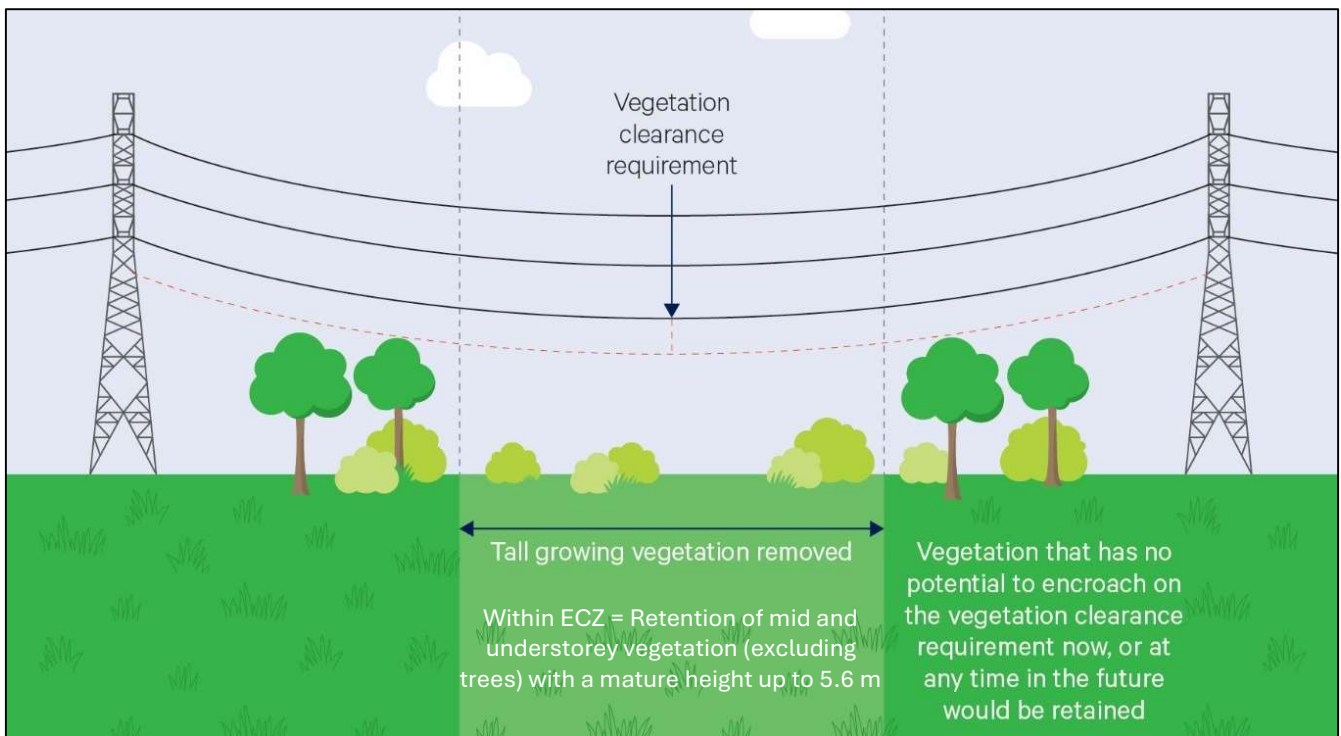


Plate 3-4 Indicative vegetation clearing mid-span

3.2. Target entities

As detailed in the Revised BDAR, it is considered that HLW is unlikely to significantly impede on habitat connectivity for microbats and some species of birds given the high mobility of aerial species. Similarly, terrestrial movement (either on the ground or below the upper stratum of vegetation) is unlikely to be substantially altered as the majority of ground and shrub vegetation will be retained within the easement, retaining foraging habitats and reducing risk of predation. As such, impacts relating to habitat connectivity on Large Forest Owls, Raptors, Cockatoos, Parrots, and microbats/megabats are considered reduced (albeit modified).

Terrestrial and arboreal mammals, small, sedentary woodland birds, reptiles and amphibians rely on vegetated connectivity for movement across the landscape, and may be impacted by HLW. Connectivity impacts may also extend to Threatened Ecological Communities, with the Revised BDAR noting potential connectivity impacts on the following community present in the HLW Area: Tableland Basalt Forest in the Sydney Basin and South Eastern Highlands Bioregions (Endangered Ecological Community per the BC Act).

Aerial species such as birds and bats that fly at heights where transmission lines are located have a high potential for collision, and may be at risk of midair collisions during stringing activities. Increased artificial lighting around construction compounds, worker accommodation facilities, and substations within the amended project footprint may impact sensory ecology of avian species (increased collision risk during nocturnal flight/foraging). The Little Eagle and Barking Owl are at increased risk of vehicle collision during the construction phase where vegetation clearing provides hunting or scavenging opportunities along easement and track edges.

Threatened fauna species specific to the HLW with potential connectivity and collision impacts are listed in Table 3-1 below (per Attachment 24 of the Revised BDAR), with the addition of a few target species for consideration.

Table 3-1 Threatened entities and potential HLW impact via connectivity and collision

Group	Potential impact (per Revised BDAR)		Entity	BC Act Listing	EPBC Act Listing	Relevant ecology for connectivity consideration
	Connectivity	Collision				
Microbats	May alter their flight path to avoid cleared areas (however may also use cleared areas as flyaways).	Interaction with transmission line structures or associated lines may alter flight patterns / behaviour or collision / injury / death.	Eastern False Pipistrelle	V	-	Eastern False Pipistrelle is a microbat with preferences for tall and wet forests, although it is found in lower altitudes and open forests (Menkhorst & Lumsden, 1995). This species selects roost trees with a Diameter at Breast Height (DBH) ranging from 55 cm up to 153.5 cm. It is dependent on large tracts of forested areas, with forests of a density >50% or more considered to provide suitable habitat. Studies have shown that patches of vegetation should have no more than a 1.3 km gap between other patches to provide suitable exchange of metapopulations (Herr, 1998). Patches themselves must be connected via corridors, thus enabling an improved exchange between patches by avoiding unnecessary energy expenditure.
			Southern Myotis	V	-	Southern Myotis is a microbat with preferences for riparian habitats given its specialised 'trawling' foraging strategy, where individuals rake their feet on a water surface to capture prey. It occurs predominantly in a narrow coastal band in northern and eastern Australia, however has also been recorded along some of the major inland rivers, reflecting its close association with water (Gonsalves and Law, 2017). Observations of the Southern Myotis have mostly been near large, permanent bodies of freshwater at low elevations where the terrain is flat and surrounded by vegetation (Anderson et al., 2006). This species is known to traverse long distances along riparian corridors, with one study recording individuals 4.95 km (straight line distance) from its known roost (Gonsalves and Law, 2017).

Group	Potential impact (per Revised BDAR)		Entity	BC Act Listing	EPBC Act Listing	Relevant ecology for connectivity consideration
	Connectivity	Collision				
			Large-eared Pied Bat	E	E	Large-eared Pied Bat forages over dry eucalypt forests, open woodlands and riparian corridors with an abundance of flying insects. Require connected patches of native vegetation, particularly along cliff lines, drainage lines and forested ridgelines; highly sensitive to habitat fragmentation due to roost fidelity (Williams and Thomson, 2019). Prefers habitat patches >20 ha with structural complexity and access to vertical features. Maternity colonies have been recorded in habitats up to several hundred hectares, but individuals may also persist in smaller patches if adjacent to escarpments or ridgelines (DCCEEW – Cth, 2021).
	N/A		Large Bent-winged Bat	V	-	N/A – species limited to collision-risk per Revised BDAR
Megabats	N/A	Interaction with transmission line structures or associated lines may alter flight patterns / behaviour or collision / injury / death.	Grey-headed Flying-fox	V	V	N/A – species limited to collision-risk per Revised BDAR

Group	Potential impact (per Revised BDAR)		Entity	BC Act Listing	EPBC Act Listing	Relevant ecology for connectivity consideration
	Connectivity	Collision				
Terrestrial & arboreal mammals	May result in increased predation when traversing open areas, and may create movement barriers	N/A	Broad-toothed Rat	V	V	The Broad-toothed Rat is a terrestrial and mostly nocturnal rodent. It is herbivorous with grasses forming the greatest component of its diet. In summer, it nests in burrows in the soil, while in winter, it dens communally during the day in nests of shredded grass situated in dense undergrowth or under logs beneath the snow. In alpine and sub-alpine areas, it is generally active in the vegetation layer under snow cover (DCCEEW - Cth, 2023b). Home range size and social dispersion vary seasonally from approximately 0.1-0.3 ha (DCCEEW - Cth, 2023b), however there is little information in the literature on maximum separation distances between isolated patches. As such, the patch size definition of 100 m, from the Biodiversity Assessment Method 2020 will be taken as a precautionary measure. While Broad-toothed Rats are good dispersers and have been shown to recolonise high-quality patches following local extinction (such as following high-intensity fires), recolonisation following such events will depend on the level of connectivity between subpopulations, as well as proximity from source subpopulations. Powerline easement vegetation can support small mammal communities, including Broad-toothed Rat, provided the vegetation is managed to maintain structural complexity without mass slashing (Clarke & White, 2008).
			Brush-tailed Phascogale	V	-	The Brush-tailed Phascogale is an arboreal marsupial dependent on hollows-bearing trees. It requires multiple den sites within a home range, often using a network of hollows across 10-20 different trees. It forages in tree canopies and on tree trunks, feeding on invertebrates, small vertebrates, nectar and bird eggs. Movement is both arboreal and terrestrial, requiring structurally connected canopies or dense groundcover in linear strips. Known to travel hundreds of metres per night, with home ranges of 40-80 ha required in forest environments (van der Ree et al., 2006).

Group	Potential impact (per Revised BDAR)		Entity	BC Act Listing	EPBC Act Listing	Relevant ecology for connectivity consideration
	Connectivity	Collision				
			Smoky Mouse	CE	E	The Smoky Mouse is a small rodent known to occur in Kosciuszko National Park and recent records in Bondo and Ingbyra State Forests. It occupies a variety of habitats however appears to prefer sub-alpine regions of up to 1,800 m in Southeastern NSW (Woods & Ford, 2000). The Smoky Mouse is primarily herbivorous but also consumes invertebrates, with diet varying seasonally according to food availability and energetic demands. There is little information on the species' movements through the landscape as most surveys have relied on trapping, however a characteristic of Smoky Mouse colonies is their ephemeral nature. This may suggest the species shifts its home range following disturbance or predation (Menkhorst & Broome, 2006).
			Koala	E	E	Koalas are tree-dwelling, obligate folivores with a highly specialised diet. The Koala's diet is defined by the availability and palatability of a limited variety of <i>Eucalyptus</i>, <i>Corymbia</i> and <i>Angophora</i> species. Koalas are nocturnal and spend significant periods of time moving across the ground between food and shelter trees. Movement increases in the breeding season (DAWE, 2022b). Koalas are known to traverse terrestrially in areas of disturbance and fragmentation, including highly urbanised areas. However, the <i>Koala Biodiversity Assessment Method Survey Guidelines</i> (DPE, 2022) suggest that fragmentation occurs once there is a gap of 500 m or more suitable habitat. Distance travelled has been shown to increase with decreasing patch connectivity, and in the most fragmented habitat, Koalas can travel over 30 km (Rus et al., 2021).

Group	Potential impact (per Revised BDAR)		Entity	BC Act Listing	EPBC Act Listing	Relevant ecology for connectivity consideration
	Connectivity	Collision				
			Spotted-tailed Quoll	V	E	The Spotted-tailed Quoll is a nocturnal, cat-sized, carnivorous marsupial occurring in eastern Australia from south-eastern Queensland to western Victoria. They are solitary animals (Todd et al. that occur at low densities. Males have larger ranges of up to a few thousand hectares in size, while females have smaller ranges of several hundred hectares. Home range sizes may vary depending on the quality of habitat – ranges may be smaller in the higher quality habitat in northern NSW than in southern NSW and Victoria. There is demonstrated absence or reduced abundance in cleared areas and the large home range size required by the species reduces viability in smaller fragments of Spotted-tailed Quoll (Threatened Species Scientific Committee, 2020). There is little information in the literature on maximum separation distances between isolated patched. As such, the patch size definition of 100 m, from the <i>Biodiversity Assessment Method 2020</i> will be taken as a precautionary measure.
			Eastern Pygmy-possum	V	-	The Eastern Pygmy-possum is a small arboreal marsupial that is distributed in the south-eastern corner of mainland Australia and in Tasmania. Pygmy-possums are agile climbers that feed mostly on the pollen and nectar from banksias, eucalypts and understorey plants and will also eat insects, seeds and fruit (NSW Scientific Committee, 2021). Home ranges are variable (0.04–19.5 ha), with males having significantly larger home ranges (Law et al., 2013), and they move through rangers on-ground. The factors threatening the survival of the Eastern Pygmy-possum include isolated sub-populations with little opportunity for dispersal which increases the risk of local extinction; clearing that results in habitat loss and fragmentation; inappropriate fire regimes that remove nectar-producing understorey plants; the loss of nest sites due to past intensive forestry and firewood collection; and predation by foxes and cats (DAWE, 2022). There is little information in the literature on maximum separation distances between isolated patched. As such, the patch size definition of 100 m, from the <i>Biodiversity Assessment Method 2020</i> will be taken as a precautionary measure.

Group	Potential impact (per Revised BDAR)		Entity	BC Act Listing	EPBC Act Listing	Relevant ecology for connectivity consideration
	Connectivity	Collision				
			Southern Greater Glider	E	E	The Greater Glider is a nocturnal, arboreal marsupial, predominantly solitary and largely restricted to eucalypt forests and woodlands of eastern Australia. It is typically found in highest abundance in taller, montane, moist eucalypt forests on fertile soils, with relatively old trees and abundant hollows. During the day, the Greater Glider shelters in tree hollows, with a particular preference for large hollows (diameter >10 cm) in large, old trees (DCCEEW - Cth, 2022). Both live and standing dead trees are used for denning (Goldingay, 2012), however the species prefers to use live hollow-bearing trees when adequate numbers are available. Habitat ranges are relatively small (1-4 ha) but are larger (up to 19 ha) in forests on less fertile sites and in more open woodland (DCCEEW - Cth, 2022). During the night, movements are primarily restricted to gliding between trees. When gliding, they can cover distances up to 100 m but usually tend not to glide further than 30 m. Maximum separation distances are highly dependent on glide angles, further detailed in this strategy. The Greater Glider is particularly sensitive to vegetation clearing and intensive timber harvesting, although responses vary according to landscape context and the extent of tree removal and retention (DCCEEW - Cth, 2022). Although Greater Gliders have small home ranges, their low reproductive rate and sensitivity to disturbance means they tend to become locally extinct in small and fragmented habitat patches. Greater Gliders disperse poorly across vegetation that is not native forest, and so do not readily recolonise isolated sites from which they have been lost (DCCEEW - Cth, 2022).

Group	Potential impact (per Revised BDAR)		Entity	BC Act Listing	EPBC Act Listing	Relevant ecology for connectivity consideration
	Connectivity	Collision				
			Yellow-bellied Glider	V	V	The Yellow-bellied Glider is a large, nocturnal glider that relies on tall eucalypt forest habitat to allow it to glide from tree-to-tree whilst foraging (DAWE, 2022a). The gliders utilise hollows in large old trees (usually more than 1 m DBH) for shelter and breeding (denning). It is active for most of the night and devotes 90% of the time spent outside the den to foraging-related activities. Home ranges are necessarily large, because the trees used as foraging substrates are dispersed and use of trees can vary through time and space. The species has very low dispersal capabilities over spaces larger than its gliding distance. Maximum separation distances are highly dependent on glide angles, further detailed in this strategy. Habitat corridors are required to facilitate dispersal of the Yellow-bellied Glider between fragmented habitat patches and/or that enable recolonization or movement away from threats. They have a glide ratio (horizontal distance/height dropped) of around 2.0, and corridors spanning gaps larger than the distance gliders are likely to be able to travel should be considered critical to the survival. There is not enough evidence to define the canopy and width characteristics of appropriate corridors. In the absence of such information, a precautionary approach should be taken to maximise dispersal by considering all habitat corridors in the species' range to be habitat critical to the survival (DAWE, 2022a).

Group	Potential impact (per Revised BDAR)		Entity	BC Act Listing	EPBC Act Listing	Relevant ecology for connectivity consideration
	Connectivity	Collision				
			Squirrel Glider	V	-	The Squirrel Glider is a medium-sized glider, requiring hollow-bearing, floriferous eucalypt open forests and woodlands with a Banksia or Acacia shrub layer, that provide den sites in tree cavities and a good winter supply of nectar. Large trees with abundant hollows are critical elements (NSW Scientific Committee, 2008). Habitat types are specific, and subject to extensive fragmentation (Goldingay & Jackson 2004). The group occupies and defends (by scent-marking) a large territory that may have about 20 hollow trees used over a period of six weeks. Mean home range is 3-4 ha in productive inland habitat fragments (NSW Scientific Committee, 2008). Squirrel Gliders have limited ability to disperse across urban or agricultural land given their relatively small glide distances. Although capable and willing to cross open habitat on occasion (e.g. to reach heavily flowering trees), they more typically require sufficient connectivity of tree cover within their maximum gliding distance. They are therefore susceptible to habitat fragmentation and hence population fragmentation (NSW Scientific Committee, 2008). Maximum separation distances are highly dependent on glide angles, further detailed in this strategy.
Small, sedentary woodland birds	May create movement barriers	N/A	Flame Robin	V	-	The Flame Robin, Scarlet Robin and Pink Robin are small, woodland songbird which occupy habitats with open ground layers of grass or bark, coarse woody debris, a sparse shrub and sapling layer. Flame and Pink Robins occupy more mesic habitats while Scarlet Robins occur in drier habitats. All species forage mostly on the ground during the cooler months. In summer and autumn, Scarlet Robins forage on arthropods from bark and foliage substrates, while Flame and Pink Robins forage flying insects close to the ground (Robinson, 1992). All robins are highly mobile and are known for seasonal/breeding migrations (Chambers and Keatley, 2010). There is little information in the literature on maximum separation distances between isolated patches. As such, the patch size definition of 100 m, from the <i>Biodiversity Assessment Method 2020</i> will be taken as a precautionary measure.
			Scarlet Robin	V	-	
			Pink Robin	V	-	

Group	Potential impact (per Revised BDAR)		Entity	BC Act Listing	EPBC Act Listing	Relevant ecology for connectivity consideration
	Connectivity	Collision				
			Varied Sittella	V	-	Varied Sittella are small, tree-trunk foraging woodland birds, mostly found in eucalypt woodlands and forests where rough-barked trees and mature eucalypts with hollows and dead branches are present. It is highly dependent on intact woodland with connected canopy structures and forms year-round social groups that defend territories. The Varied Sittella feeds on arthropods gleaned from crevices in rough or decorticated bark, dead branches, standing dead trees, and from small branches and twigs in the tree canopy. It builds a cup-shaped nest of plant fibres and cobwebs in an upright tree fork high in the living tree canopy, and often re-uses the same fork or tree in successive years (NSW Scientific Committee, 2010). The sedentary nature of this species makes land clearing a potential barrier to movement; coupled with poor disbursement, not often crossing gaps >100-150 m (NSW Scientific Committee, 2010).
			Brown Treecreeper (eastern subspecies)	V	V	Brown Treecreepers (eastern subspecies) inhabit dry open eucalypt forests and woodlands, primarily occupying woodlands dominated by stringybarks or other rough-barked eucalypts. These usually have an open grassy understorey, occasionally with one or more shrub species. The subspecies is also found in mallee, forests and woodland subject to periodic inundation. It is not usually found in woodlands with a dense shrub layer and is absent from heavily degraded woodlands and steep rocky hills (DCCEEW - Cth, 2023a). Fallen timber is an important habitat component for foraging. The subspecies forages on the ground and in mature live and dead trees, where it feeds on invertebrate prey. It also feeds on nectar from Mugga Ironbark (<i>Eucalyptus sideroxylon</i>) and Paperbarks, as well as sap and lizards. Ideal habitat requires an ongoing disturbance regime, such as historical Indigenous burning practices, to suppress the ground layer and prevent it from becoming too dense and uniform. The subspecies roosts in tree cavities in a variety of eucalypt species and hollows in live or dead. The Conservation Advice states that gaps greater than 100 m between trees should be avoided to ensure that populations remain connected (DCCEEW - Cth, 2023a).

Group	Potential impact (per Revised BDAR)		Entity	BC Act Listing	EPBC Act Listing	Relevant ecology for connectivity consideration
	Connectivity	Collision				
Forest owls	N/A	May become entangled / collide with powerlines	Barking Owl	V	-	N/A – species limited to collision-risk per Revised BDAR
			Masked Owl	V	-	
			Powerful Owl	V	-	
			Sooty Owl	V	-	
Cockatoos	N/A	May become entangled / collide with powerlines	Gang-gang Cockatoo	E	E	N/A – species limited to collision-risk per Revised BDAR
			Glossy Black-Cockatoo	V	V	
Raptors	N/A	May become entangled / collide with powerlines	Square-tailed Kite	V	-	N/A – species limited to collision-risk per Revised BDAR
			Little Eagle	V	-	
			White-bellied Sea-eagle	V	-	
Migratory birds	N/A	May become entangled / collide with powerlines	Swift Parrot	E	CE	N/A – species limited to collision-risk per Revised BDAR
			Fork-tailed Swift	P	M	
			Sharp-tailed Sandpiper	P	M	
			Red-necked Stint	P	M	

Group	Potential impact (per Revised BDAR)		Entity	BC Act Listing	EPBC Act Listing	Relevant ecology for connectivity consideration
	Connectivity	Collision				
			Latham's Snipe	P	M	
			Common Greenshank	P	M	
			Marsh Sandpiper	P	M	
Reptiles	Restricted home ranges may be impeded by cleared land	N/A	Alpine She-oak Skink	E	E	The Alpine She-oak Skink is a cryptic grassland specialist restricted to the mainland Australian Alps. It has specific habitat requirements, preferring tree-less or very lightly treed areas that contain tussock grasses, low heath or a combination of both. Within this habitat the species shelters beneath litter, rocks, logs and other ground debris, and has been observed basking on grass tussocks. It has a highly restricted range, however has been found to persist under a range of habitat conditions, including a temporary loss of resources, a range of ground stratum vegetation heights and a range of elevation-associated microclimate attributes (Hartley et al., 2023). There is little information in the literature on maximum separation distances between isolated patches. As such, the patch size definition of 100 m, from the <i>Biodiversity Assessment Method 2020</i> will be taken as a precautionary distance.

Group	Potential impact (per Revised BDAR)		Entity	BC Act Listing	EPBC Act Listing	Relevant ecology for connectivity consideration
	Connectivity	Collision				
			Pink-tailed Legless Lizard	V	V	The Pink-tailed Legless Lizard is the most south-easterly occurring species of the genus and is distributed along the western foothills of the Great Dividing Range. It cohabitates in ant burrows, commonly below rocks, while feeding on the ant's eggs and larvae. Known and potential threats to the species include pasture improvement, overgrazing, soil disturbance, rock removal, weed invasion, inappropriate fire regimes and fire management activities, recreational activities and predation (Wong et al., 2011). Observations of the lizard's distribution patterns are limited due to its cryptic nature. However, the species has been recorded on roadsides and urban areas, and connectivity for this species is likely dependent on a combination of rock, vegetation and bare ground. Plate-sized bush rock in grassland is critical for its occurrence. The Threatened Biodiversity Data Collection (DCCEEW – NSW, 2025) suggests a 50 m maximum separation distances between isolated patches for this species, limited to grassland containing plate rock.
			Striped Legless Lizard	V	V	The Striped Legless Lizard is a grassland specialist, found only in areas of native grassland and nearby grassy woodland and exotic pasture (Threatened Species Scientific Committee, 2016). It has a preference for high grass structural complexity and floristic community, most commonly been encountered in natural temperate grasslands dominated by native grasses (Howland et al. 2016). Utilises inter-tussock spaces, cracks in dry soil and shelter beneath rocks and logs for thermoregulation. Striped Legless Lizards appear to have limited dispersal distances, with evidence suggesting genetic differentiation at distances less than 400 m (Threatened Species Scientific Committee, 2016).
Amphibians	Installation of access tracks across waterways may reduce	N/A	Sloane's Froglet	E	E	Sloane's Froglet, Booroolong Frog and Yellow-spotted Tree Frog are all species dependent on stream and riparian habitats. Sloane's Froglet occupies ephemeral and temporary freshwater wetlands, flood-runners and seasonally inundated grasslands, with breeding triggered by rainfall and surface water (NSW Scientific Committee, 2023). The
			Booroolong Frog	E	E	

Group	Potential impact (per Revised BDAR)		Entity	BC Act Listing	EPBC Act Listing	Relevant ecology for connectivity consideration
	Connectivity	Collision				
	connectivity along the length of the stream		Yellow-spotted Tree Frog	CE	CE	Booroolong Frog lives exclusively along rocky sections of permanent streams in wet and dry forest, woodland, and cleared grazed land. The species is reliant on permanent running water and does not occupy ephemeral streams, or streams that have dried during severe drought (Threatened Species Scientific Committee, 2021). The Yellow-spotted Bell Frog has been found in permanent ponds, swamps, lagoons, farm dams and the still backwaters of slow flowing streams, usually with emergent vegetation such as tall reeds or with overhanging grassy banks (Threatened Species Scientific Committee, 2019). The <i>NSW Survey Guide for Threatened Frogs</i> (DPIE, 2020) suggests a 50 m maximum separation distance for the Booroolong Frog, the smallest of the three species.
Insects	Restricted home ranges may be impeded by cleared land	N/A	Key's Matchstick Grasshopper	E	E	Historical records of Key's Matchstick Grasshopper are typically associated with primary and secondary native grasslands, dominated by tall stands of <i>Themeda triandra</i> (Kangaroo Grass) and species within the Asteraceae family (TSSC, 2020). The species has also been recorded in other vegetation types containing a native grass understory. The species feeds on a range of native and introduced species, preferring small ephemeral plants to the larger perennial species (TSSC, 2016). The relationship to <i>T. triandra</i> is considered only for shelter from predators or climactic stressors and it is not part of the species food requirements. An expert report prepared for the Revised BDAR noted that construction of access tracks and road improvements can fragment the grasshopper's habitat, isolating populations and limiting genetic diversity (Yagui, 2024). Maximum dispersal distance is estimated at 10 m (TSSC, 2020), therefore the maximum separation distance between two isolated patches would be 10 m.

Group	Potential impact (per Revised BDAR)		Entity	BC Act Listing	EPBC Act Listing	Relevant ecology for connectivity consideration
	Connectivity	Collision				
TECs	Increased fragmentation may result in loss of community composition, structure and function.	N/A	Tableland Basalt Forest in the Sydney Basin and South Eastern Highlands Bioregions	EEC	-	Tableland Basalt Forest is dominated by an open eucalypt canopy of variable composition. <i>Eucalyptus viminalis</i>, <i>E. radiata</i>, <i>E. dalrympleana</i> subsp. <i>dalrympleana</i> and <i>E. pauciflora</i> may occur in the community in pure stands or in varying combinations. The community typically has an open canopy of eucalypts with sparse mid-story shrubs (e.g., <i>Acacia melanoxylon</i> and <i>A. dealbata</i>) and understory shrubs (e.g., <i>Rubus parvifolius</i>) and a dense groundcover of herbs and grasses, although disturbed stands may lack either or both of the woody strata (DCCEEWS – NSW, 2025). The structure of the community varies depending on past and current disturbances, particularly fire history, clearing and grazing. Contemporary tree-dominated stands of the community are largely relics or regrowth of originally taller forests and woodlands, which are likely to have had scattered shrubs and a largely continuous grassy groundcover. At some sites, mature trees may exceed 30 m tall, although regrowth stands may be shorter than 10 m tall (DCCEEWS – NSW, 2025).

P = Protected; V = Vulnerable; E = Endangered; CE = Critically Endangered; M = Migratory; EEC = Endangered Ecological Community; - = not listed

4. Connectivity strategy measures

This strategy will be carried out during the pre-construction and construction phases of HLW, with the monitoring phase continuing post-construction and into operation in accordance with Annexure H: Biodiversity Monitoring Program of the HLW BMP (to be detailed in the Transgrid Operational Biodiversity Management Plan).

4.1. Retention

Micro-siting of transmission line infrastructure, associated work sites and other areas of disturbance has been undertaken in accordance with ecological constraints mapped in the HLW Area (refer Section 7.2.2 of the HLW BMP). This has resulted in the prioritised avoidance to the extent possible for:

- Threatened species habitat, including:
 - Habitat trees.
 - Rocky habitats (i.e., rock outcrops, large boulders, piled rock, and rock features).
 - Course woody debris.
- Waterways (particularly Key Fish Habitat [KFH]) vegetated riparian zones and instream vegetation.
- Nature refuges and existing conservation lands (i.e., established BioBank and Biodiversity Stewardship sites, Conservation Agreement sites, National Parks and State Forests).
- Artificial threatened species habitats.

The following key measures will be implemented within partial clearing zones (ECZ & HTZ) to retain connectivity along the HLW alignment:

1. Retention of native grasses, sedges, herbs, logs, rocks and soil crusts to the extent possible.
2. Retention of selected shrubs with a mature height up to 5.6 m, particularly targeting retention of clusters with current connectivity across the easement. This will be prioritised within connectivity corridors through the selection of suitable clearing techniques to retain shrubs such as hand clearing / felling.
3. Ground impacts will be minimised through:
 - a. Choice of low-impact machinery and tracks.
 - b. Minimising and consolidating access paths.
 - c. Restricting machinery access in ecologically sensitive areas (e.g., wetlands and bogs).
4. Hand clearing/felling will occur in the immediate vicinity of areas of very high ecological sensitivity identified in the constraints mapping (refer Section 7.2.2 of the HLW BMP).
5. Implementation of Annexure G: Rehabilitation Plan of the HLW BMP, including:
 - a. The appropriate salvage, storage and reuse of habitat resources (large and course woody debris, rock refugia, aquatic habitats) in accordance with relevant HLW bushfire controls.
 - b. Rehabilitation of temporary disturbance sites (temporarily disturbed portions of the TCZ; e.g., brake and winch sites, temporary access tracks, construction compounds, workforce accommodation facilities) to a point of natural regeneration.
 - c. Rehabilitation of Key's Matchstick Grasshopper habitats via direct seeding.

4.2. Connectivity corridors

This strategy designates connectivity corridors by target fauna use into two categories: Ground Corridors and Glider Crossings, summarised in Table 4-1.

Table 4-1 Connectivity corridor categories

Connectivity corridor category	Rational	Target species
Ground Corridors	As detailed in Section 3, all canopy trees must be removed within the ECZ to accommodate 500 kV transmission lines at maximum line operating conditions. The requirements of the HTZ would result in the further removal of trees within proximity to the alignment where there is a potential for them to impact on transmission lines. This prevents the retention of continuous habitat structure (canopy, mid and ground strata) within disturbance zones. As such, Ground Corridors will be defined linear areas connecting the HLW Area to adjacent habitats; designated and strategically retained/managed to facilitate the safe and functional movement of fauna and dispersal of flora across the landscape. They are intended to minimise habitat fragmentation and maintain ecological processes by preserving ground and shrub habitat structure, particularly for species with limited dispersal ability or reliance on specific movement pathways.	• Eastern False Pipistrelle. • Southern Myotis. • Large-eared Pied Bat. • Broad-toothed Rat. • Brush-tailed Phascogale. • Smoky Mouse. • Koala. • Eastern Pygmy-possum. • Spotted-tailed Quoll. • Flame Robin. • Scarlet Robin. • Pink Robin. • Varied Sittella. • Brown Treecreeper (Eastern Subspecies). • Alpine She-oak Skink. • Pink-tailed Legless Lizard. • Striped Legless Lizard. • Sloane's Froglet. • Booroolong Frog. • Yellow-spotted Tree Frog. • Key's Matchstick Grasshopper.
Glider Crossings	Glider Crossings are proposed at locations where vegetation clearing for HLW will result in the fragmentation of threatened Glider habitats and create a barrier effect to the movement of these species. Based on the Revised BDAR and limitations of Glider capability in traversing open areas (Goldingday & Taylor 2009; Goldingay 2014), hazard reduction requirements would restrict the retention of trees with adequate heights to enable Glider crossings. As a result, installation of permanent Glider poles within Glider Crossings is deemed the preferred connectivity mitigation measure.	• Southern Greater Glider. • Squirrel Glider. • Yellow-bellied Glider.

4.3. Ground Corridors

4.3.1. Ground corridor locations

The outcomes of the Transgrid Connectivity Review Letter (July, 2025) for ground corridors is presented in Table 4-2 below. This identifies the corridor ID, associated species, existing connectivity and impact to connectivity based on the approved disturbance areas. Connectivity corridor infrastructure (such as rocks, and other refugia) will be installed immediately after clearing, or as early as possible (generally one month) to maintain home ranges and enable safe movement of displaced fauna.

All ground corridor locations must be reviewed through the final selection process outlined in Section 4.5.

Table 4-2 Desk based assessment of ground corridors (Transgrid, June 2025)

Corridor ID	Associated species	Existing connectivity	Humelink impact to connectivity	Ground Corridor recommendations
INL_23_92	Bush Stone-curlew, Koala and Sloane's Froglet.	Key riparian crossings	Moderate	Review Final Layout Plans and minimise impacts to O'Briens Creek.
INL_23_90	Bush Stone-curlew, Koala and Squirrel Glider.	Key riparian crossings	High	Corridor of scattered paddock trees along Kyeamba River Floodplain. Development will have minimal impact to existing connectivity.
INL_20_88	Bush Stone-curlew, Koala, Squirrel Glider and Squirrel Glider endangered population.	Non-functional corridor (parallel transmission lines)	Moderate	Development will have minimal impact to existing connectivity.
INL_17_86	Koala, Squirrel Glider, Squirrel Glider endangered population and Striped Legless Lizard.	Intact vegetation corridor	Connectivity maintained	Development will have minimal impact to existing connectivity.
INL_17_85	Koala, Pink-tailed Legless Lizard, Squirrel Glider and Squirrel Glider endangered population.	Non-functional corridor (parallel transmission lines)	Connectivity maintained	Field verification to assess existing connectivity across TL to north between 500 - 1200m to east to incorporate surface rocks for Pink-tailed Work-lizard.

Corridor ID	Associated species	Existing connectivity	Humelink impact to connectivity	Ground Corridor recommendations
INL_17_83	Koala, Pink-tailed Legless Lizard, Squirrel Glider and Squirrel Glider endangered population.	Non-functional corridor (plantation)	Connectivity maintained	Current location unsuitable due to cleared plantation forest to the north. Field verification required to assess alternate location ~1400 m west to incorporate surface rock for Pink-tailed Worm-lizard.
INL_17_84	Koala, Pink-tailed Legless Lizard and Squirrel Glider.	Fragmented vegetation corridor	Connectivity maintained	Corridor of scattered paddock trees along Turners Creek. Development will have minimal impact to existing connectivity.
BON_2_81	Nil	Fragmented vegetation corridor	High	Maintain corridor along Nacki Nacki Creek riparian zone for non-threatened species. Connectivity impacts to be reviewed against Final Layout Plans.
SNO_TG_1	Eastern Pygmy-possum, Greater Glider, Koala and Squirrel Glider.	Fragmented vegetation corridor	High	Review ground corridor connectivity for based on Final Layout Plans.
SNO_TG_2	Eastern Pygmy-possum, Greater Glider, Koala and Pink Robin.	Fragmented vegetation corridor	High	Review ground corridor connectivity for based on Final Layout Plans.
SNO_GREH_2	Eastern Pygmy-possum, Greater Glider, Koala and Pink Robin.	Key riparian crossings	Moderate	Provide ground level shrub regeneration / revegetation for Eastern Pygmy Possum and small woodland birds.

Corridor ID	Associated species	Existing connectivity	Humelink impact to connectivity	Ground Corridor recommendations
SNO_TG_3	Eastern Pygmy-possum, Greater Glider, Koala, Pink Robin, Squirrel Glider and Yellow-bellied Glider population on the Bago Plateau.	Fragmented vegetation corridor	High	Review ground corridor connectivity based on Final Layout Plans.
SNO_TG_4	Eastern Pygmy-possum, Koala and Squirrel Glider.	Fragmented vegetation corridor	High	Review ground corridor connectivity for based on Final Layout Plans.
BON_2_80	Nil	Non-functional corridor (plantation)	High	Shift corridor ~1700 m west to Sharps Creek and maintain for non-threatened species. A supplementary ground corridor should also be assessed ~1700 m east near Wondalga Road and the HumeLink T-junction. Connectivity impacts to be reviewed against Final Layout Plans.
SNO_GREH_3	Greater Glider, Koala and Yellow-bellied Glider population on the Bago Plateau.	Intact vegetation corridor	High	Maintain corridor along riparian corridor for non-threatened species
SNO_TG_5	Eastern Pygmy-possum, Koala and Pink Robin.	Fragmented vegetation corridor	High	Review ground corridor connectivity for based on Final Layout Plans.

Corridor ID	Associated species	Existing connectivity	Humelink impact to connectivity	Ground Corridor recommendations
BON_2_64	Bush Stone-curlew, Eastern Pygmy-possum, Greater Glider, Koala, Pink Robin, Squirrel Glider and Yellow-bellied Glider population on the Bago Plateau.	Key riparian crossings	Connectivity maintained	Ground corridor connectivity maintained by clearing model.
INL_14_63	Eastern Pygmy-possum, Koala and Squirrel Glider.	Key riparian crossings	Connectivity maintained	Corridor of scattered paddock trees along Wilson River Floodplain. Development will have minimal impact to existing connectivity.
SNO_GREH_1	Brush-tailed Phascogale, Eastern Pygmy-possum, Greater Glider, Koala, Smoky Mouse, Squirrel Glider and Yellow-bellied Glider population on the Bago Plateau.	Intact vegetation corridor	Connectivity maintained	Shrubby corridor for EPP, Broad-toothed Rat, Smoky Mouse and small woodland birds
SNO_1_72	Eastern Pygmy-possum, Greater Glider, Koala, Squirrel Glider and Yellow-bellied Glider population on the Bago Plateau.	Fragmented vegetation corridor	Connectivity maintained	No specific actions.

Corridor ID	Associated species	Existing connectivity	Humelink impact to connectivity	Ground Corridor recommendations
SNO_1_73	Brush-tailed Phascogale, Eastern Pygmy-possum, Greater Glider, Koala, Pink Robin and Yellow-bellied Glider population on the Bago Plateau.	Intact vegetation corridor	High	Further assessment to consider establishment of ground corridors for Eastern Pygmy-possum, Brush-tailed Phascogale and Small Woodland Birds across HumeLink and TL 64 and 66.
SNO_1_74	Brush-tailed Phascogale, Eastern Pygmy-possum, Greater Glider, Koala, Pink Robin, Squirrel Glider and Yellow-bellied Glider population on the Bago Plateau.	Intact vegetation corridor	High	Further assessment to consider establishment of ground corridors for Eastern Pygmy-possum, Brush-tailed Phascogale and Small Woodland Birds across HumeLink and TL 64 and 66.
SNO_1_93	Brush-tailed Phascogale, Eastern Pygmy-possum, Greater Glider, Koala, Pink Robin, Squirrel Glider, Yellow-bellied Glider population on the Bago Plateau and Yellow-spotted Tree Frog.	Intact vegetation corridor	High	Further assessment to consider establishment of ground corridors for Eastern Pygmy-possum, Brush-tailed Phascogale and Small Woodland Birds across HumeLink and TL 64 and 66.

Corridor ID	Associated species	Existing connectivity	Humelink impact to connectivity	Ground Corridor recommendations
SNO_1_94	Alpine She-oak Skink, Brush-tailed Phascogale, Eastern Pygmy-possum, Greater Glider, Koala, Pink Robin, Squirrel Glider and Yellow-bellied Glider population on the Bago Plateau.	Non-functional corridor (parallel transmission lines)	Moderate	Further assessment to consider establishment of ground corridors for Eastern Pygmy-possum, Brush-tailed Phascogale and Small Woodland Birds across HumeLink and TL 64 and 66.
SNO_1_96	Alpine She-oak Skink, Eastern Pygmy-possum, Greater Glider, Koala, Pink Robin and Yellow-bellied Glider population on the Bago Plateau.	Non-functional corridor (parallel transmission lines)	High	Further assessment to consider establishment of ground corridors for Eastern Pygmy-possum, Brush-tailed Phascogale and Small Woodland Birds across HumeLink and TL 64 and 66.
SNO_1_97	Alpine She-oak Skink, Eastern Pygmy-possum, Greater Glider, Koala, Pink Robin and Yellow-bellied Glider population on the Bago Plateau.	Non-functional corridor (parallel transmission lines)	High	Further assessment to consider establishment of ground corridors for Eastern Pygmy-possum, Brush-tailed Phascogale and Small Woodland Birds across HumeLink and TL 64 and 66.

Corridor ID	Associated species	Existing connectivity	Humelink impact to connectivity	Ground Corridor recommendations
SNO_1_98	Alpine She-oak Skink, Eastern Pygmy-possum, Greater Glider, Koala, Pink Robin, Squirrel Glider and Yellow-bellied Glider population on the Bago Plateau.	Non-functional corridor (parallel transmission lines)	High	Further assessment to consider establishment of ground corridors for Eastern Pygmy-possum, Brush-tailed Phascogale and Small Woodland Birds across HumeLink and TL 64 and 66.
SNO_1_75	Alpine She-oak Skink, Eastern Pygmy-possum, Greater Glider, Koala, Pink Robin, Squirrel Glider and Yellow-bellied Glider population on the Bago Plateau.	Non-functional corridor (parallel transmission lines)	High	Further assessment to consider establishment of ground corridors for Eastern Pygmy-possum, Brush-tailed Phascogale and Small Woodland Birds across HumeLink and TL 64 and 66.
SNO_1_99	Alpine She-oak Skink, Eastern Pygmy-possum, Greater Glider, Koala, Squirrel Glider and Yellow-bellied Glider population on the Bago Plateau.	Non-functional corridor (parallel transmission lines)	High	Further assessment to consider establishment of ground corridors for Eastern Pygmy-possum, Brush-tailed Phascogale and Small Woodland Birds across HumeLink and TL 64 and 66.

Corridor ID	Associated species	Existing connectivity	Humelink impact to connectivity	Ground Corridor recommendations
SNO_1_102	Brush-tailed Phascogale, Eastern Pygmy-possum, Greater Glider, Koala, Squirrel Glider, Yellow-bellied Glider population on the Bago Plateau and Yellow-spotted Tree Frog.	Non-functional corridor (parallel transmission lines)	High	Further assessment to consider establishment of ground corridors for Eastern Pygmy-possum, Brush-tailed Phascogale and Small Woodland Birds across HumeLink and TL 64 and 66.
SNO_1_100	Alpine She-oak Skink, Brush-tailed Phascogale, Eastern Pygmy-possum, Greater Glider, Koala, Squirrel Glider and Yellow-bellied Glider population on the Bago Plateau.	Non-functional corridor (parallel transmission lines)	High	Further assessment to consider establishment of ground corridors for Eastern Pygmy-possum, Brush-tailed Phascogale and Small Woodland Birds across HumeLink and TL 64 and 66.
SNO_1_101	Brush-tailed Phascogale, Eastern Pygmy-possum, Greater Glider, Koala, Squirrel Glider and Yellow-bellied Glider population on the Bago Plateau.	Non-functional corridor (parallel transmission lines)	High	Further assessment to consider establishment of ground corridors for Eastern Pygmy-possum, Brush-tailed Phascogale and Small Woodland Birds across HumeLink and TL 64 and 66.

Corridor ID	Associated species	Existing connectivity	Humelink impact to connectivity	Ground Corridor recommendations
SNO_1_76	Brush-tailed Phascogale, Eastern Pygmy-possum, Greater Glider, Koala, Squirrel Glider and Yellow-bellied Glider population on the Bago Plateau.	Non-functional corridor (parallel transmission lines)	High	Further assessment to consider establishment of ground corridors for Eastern Pygmy-possum, Brush-tailed Phascogale and Small Woodland Birds across HumeLink and TL 64 and 66.
SNO_1_103	Alpine She-oak Skink, Brush-tailed Phascogale, Eastern Pygmy-possum, Greater Glider, Koala, Pink Robin, Squirrel Glider and Yellow-bellied Glider population on the Bago Plateau.	Non-functional corridor (parallel transmission lines)	High	Further assessment to consider establishment of ground corridors for Eastern Pygmy-possum, Brush-tailed Phascogale and Small Woodland Birds across HumeLink and TL 64 and 66.
SNO_1_104	Alpine She-oak Skink, Brush-tailed Phascogale, Eastern Pygmy-possum, Greater Glider, Koala, Pink Robin, Squirrel Glider and Yellow-bellied Glider population on the Bago Plateau.	Non-functional corridor (parallel transmission lines)	High	Further assessment to consider establishment of ground corridors for Eastern Pygmy-possum, Brush-tailed Phascogale and Small Woodland Birds across HumeLink and TL 64 and 66.

Corridor ID	Associated species	Existing connectivity	Humelink impact to connectivity	Ground Corridor recommendations
SNO_1_105	Alpine She-oak Skink, Brush-tailed Phascogale, Eastern Pygmy-possum, Greater Glider, Koala, Pink Robin, Squirrel Glider and Yellow-bellied Glider population on the Bago Plateau.	Non-functional corridor (parallel transmission lines)	High	Further assessment to consider establishment of ground corridors for Eastern Pygmy-possum, Brush-tailed Phascogale and Small Woodland Birds across HumeLink and TL 64 and 66.
SNO_1_106	Alpine She-oak Skink, Brush-tailed Phascogale, Eastern Pygmy-possum, Greater Glider, Koala, Pink Robin, Squirrel Glider and Yellow-bellied Glider population on the Bago Plateau.	Non-functional corridor (parallel transmission lines)	High	Further assessment to consider establishment of ground corridors for Eastern Pygmy-possum, Brush-tailed Phascogale and Small Woodland Birds across HumeLink and TL 64 and 66.
SNO_1_107	Brush-tailed Phascogale, Greater Glider, Koala, Squirrel Glider and Yellow-bellied Glider population on the Bago Plateau.	Non-functional corridor (parallel transmission lines)	High	Further assessment to consider establishment of ground corridors for Eastern Pygmy-possum, Brush-tailed Phascogale and Small Woodland Birds across HumeLink and TL 64 and 66.

Corridor ID	Associated species	Existing connectivity	Humelink impact to connectivity	Ground Corridor recommendations
SNO_1_108	Alpine She-oak Skink, Brush-tailed Phascogale, Eastern Pygmy-possum, Greater Glider, Koala, Squirrel Glider and Yellow-bellied Glider population on the Bago Plateau.	Non-functional corridor (parallel transmission lines)	High	Further assessment to consider establishment of ground corridors for Eastern Pygmy-possum, Brush-tailed Phascogale and Small Woodland Birds across HumeLink and TL 64 and 66.
SNO_1_77	Alpine She-oak Skink, Brush-tailed Phascogale, Eastern Pygmy-possum, Greater Glider, Koala, Squirrel Glider and Yellow-bellied Glider population on the Bago Plateau.	Non-functional corridor (parallel transmission lines)	High	Further assessment to consider establishment of ground corridors for Eastern Pygmy-possum, Brush-tailed Phascogale and Small Woodland Birds across HumeLink and TL 64 and 66.
SNO_1_109	Alpine She-oak Skink, Brush-tailed Phascogale, Eastern Pygmy-possum, Greater Glider, Koala, Pink Robin, Squirrel Glider and Yellow-bellied Glider population on the Bago Plateau.	Non-functional corridor (parallel transmission lines)	High	Further assessment to consider establishment of ground corridors for Eastern Pygmy-possum, Brush-tailed Phascogale and Small Woodland Birds across HumeLink and TL 64 and 66.

Corridor ID	Associated species	Existing connectivity	Humelink impact to connectivity	Ground Corridor recommendations
SNO_1_110	Brush-tailed Phascogale, Eastern Pygmy-possum, Greater Glider, Koala, Squirrel Glider and Yellow-bellied Glider population on the Bago Plateau.	Non-functional corridor (parallel transmission lines)	High	Further assessment to consider establishment of ground corridors for Eastern Pygmy-possum, Brush-tailed Phascogale and Small Woodland Birds across HumeLink and TL 64 and 66.
SNO_1_111	Brush-tailed Phascogale, Eastern Pygmy-possum, Greater Glider, Koala and Squirrel Glider.	Non-functional corridor (parallel transmission lines)	High	Shrubby corridor for EPP and small woodland birds
SNO_1_112	Brush-tailed Phascogale, Eastern Pygmy-possum, Greater Glider, Koala, Squirrel Glider and Yellow-bellied Glider population on the Bago Plateau.	Non-functional corridor (parallel transmission lines)	High	Further assessment to consider establishment of ground corridors for Eastern Pygmy-possum, Brush-tailed Phascogale and Small Woodland Birds across HumeLink and TL 64 and 66.

Corridor ID	Associated species	Existing connectivity	Humelink impact to connectivity	Ground Corridor recommendations
SNO_1_113	Alpine She-oak Skink, Brush-tailed Phascogale, Eastern Pygmy-possum, Greater Glider, Koala, Pink Robin, Squirrel Glider and Yellow-bellied Glider population on the Bago Plateau.	Non-functional corridor (parallel transmission lines)	High	Further assessment to consider establishment of ground corridors for Eastern Pygmy-possum, Brush-tailed Phascogale and Small Woodland Birds across HumeLink and TL 64 and 66.
SNO_1_78	Alpine She-oak Skink, Brush-tailed Phascogale, Eastern Pygmy-possum, Greater Glider, Koala, Pink Robin, Squirrel Glider and Yellow-bellied Glider population on the Bago Plateau.	Non-functional corridor (parallel transmission lines)	High	Further assessment to consider establishment of ground corridors for Eastern Pygmy-possum, Brush-tailed Phascogale and Small Woodland Birds across HumeLink and TL 64 and 66.

4.3.2. Selection principles

General selection principles for Ground Corridors include:

- Final clearing footprints and layout plans.
- Connectivity on the regional landscape scale, particularly with areas of remnant native vegetation.
- Presence of representative woodland vegetation if limited or poorly represented, including Threatened Ecological Communities (TECs).
- Presence of major riparian areas, including KFH.
- Diversity and cover of native groundcovers and shrubs.
- Proximity of threatened flora and fauna records.
- Proximity to biodiversity stewardship sites, conservation reserve estates, National Parks and State Forests.
- Corridor width and configuration – corridors are often more effective in supporting biodiversity by reducing edge effects and providing larger, more connected habitats.
- Long-term viability and resilience – selection should account for the long-term viability of the corridor, including potential for climate change impacts, fire risk, and pest species. Prioritising areas with potential for ecological resilience and long-term stability is critical.
- Restoration potential – some corridors should be chosen based on their potential for restoration and improvement, particularly where transmission lines parallel. Areas that are currently degraded but have the capacity for rehabilitation should be considered.

Final selection of Ground Corridors will be undertaken in a two-step process: desktop review (Section 4.3.1) and field surveys (Section 4.3.2). Corridor widths will be extended to the greatest extent practicable.

4.3.3. Controls

The extent (within easement) of final Ground Corridors will be mapped following completion of the Corridor Inspection Report (refer Section 4.3.3) on all construction planning maps and clearly communicated to construction teams prior to clearing occurring in that area. Physical delineation (refer Annexure B: Clearing Protocol of the HLW BMP) will occur prior to vegetation clearing commencing in the area and involve tall marker posts installed at incremental distances, line of sight or maximum distance of 20 m, along the outer edge. This will allow safe movement of fauna and prevent entanglement while controlling inadvertent impacts from construction. Signage will be clear and simple in nature, for example 'Connectivity Corridor', and adequately sized so it can be seen from a distance of at least 20 m.

The following clearing restrictions will apply within Ground Corridors:

- Hand clearing/felling and limited low-impact machinery to minimise ground impacts if required.
- Prioritised retention of native grasses, sedges, herbs, logs, rocks and soil crusts to support ground-dwelling fauna and native plant regeneration (foraging habitat for species such as birds and the Key's Matchstick Grasshopper).
- Prioritised retention of shrubs with a mature height up to 5.6 m, particularly targeting retention of clusters to provide:
 - Critical structural continuity (critical for birds, reptiles, terrestrial mammals)
 - Vegetated stepping stones for fauna with limited dispersal abilities (e.g., Eastern Pygmy-possum).
 - Shelter and thermal cover for fauna dispersing through the easement.
 - Stepwise vertical connectivity between shrub and groundcovers.
 - Nectar and seed resources for pollinators, birds and small mammals.

- Protection against edge effects (wind, weeds, desiccation).

Where access tracks are required to cross ground connectivity corridors, the location will be selected to minimise impact to the corridor and consideration would be given to the target species. New access tracks that intersect with Ground Corridors (and require vegetation clearing/management) will be rehabilitated following construction works (pending landowner approval and operational necessity; refer to Annexure G: Rehabilitation Plan of the HLW BMP). The short-term duration of use of the access tracks for construction, and the rare intermittent use during operation, are unlikely to impact on the proposed effectiveness of the Ground Corridors.

In accordance with Annexure G: Rehabilitation Plan of the HLW BMP: reuse of terrestrial resources (e.g., large and coarse woody debris, rock refugia, aquatic habitats) will be prioritised within Ground Corridors and in aquatic habitat impacted by HLW construction. Supplementary ground refugia provide shelter for ground dwelling species, while shorter felled timber lengths may be incorporated to provide off ground connectivity for species including Eastern pygmy possum, Brush-tailed Phascogale and smaller woodland birds. Short sections of felled timber (~3 m) may also be embedded into the ground at intervals across wider clearings to serve as temporary staging points for small birds until sufficient shrubby regrowth provides natural connectivity.

4.4. Glider Crossings

All Glider Crossings will also include Ground Corridors per Section 4.2.1, however clearing may be required for Glider pole installation. Rehabilitation would occur post-installation per Annexure G: Rehabilitation Plan of the HLW BMP as necessary. Glider poles are to be installed as early as possible following the clearing of vegetation occurs, where a period greater than 1 month is likely to occur between clearing completion and pole installation consideration will be given to retaining existing glide path corridors until installation is possible.

4.4.1. Glider crossing locations

The Transgrid Connectivity Review Letter (July, 2025) identified 43 glider corridors in the HumeLink West construction package in three geographic zones as described below. provides a summary of the The outcomes of the Transgrid Connectivity Review Letter (July, 2025) for glider corridors is presented in Table 4-3 below. This identifies the corridor ID, target glider species, existing connectivity and impact to connectivity based on the approved disturbance areas and the likelihood that glider poles would be required to maintain connectivity.

All glider corridor locations must be reviewed through the final selection process outlined in Section 4.5.

4.4.1.1. Wagga Wagga to Green Hills State Forest: Squirrel Glider in the Wagga Wagga Local Government Area

The Wagga Wagga to Green Hills State Forest Glider Crossing Zone spans approximately 65 kilometres, extending from Wagga Wagga in the west to the western boundary of Green Hills State Forest in the east. This zone is associated with the Squirrel Glider population within the Wagga Wagga Local Government Area (LGA), primarily based on species records from the NSW BioNet Atlas.

Vegetation within this zone is highly cleared and fragmented. Nevertheless, remnant vegetation—including riparian corridors, roadside vegetation, scattered paddock trees, and isolated patches—plays a critical role in maintaining landscape connectivity for the Squirrel Glider population.

Seven connectivity corridors have been identified within this zone, all of which are designated as Glider Crossing Zones for further assessment during implementation of this Connectivity Strategy.

4.4.1.2. Green Hills State Forest: Southern Greater Glider and Squirrel Glider

The Green Hills State Forest Glider Crossing Zone extends approximately 26 kilometres through Green Hills State Forest, located west of Batlow. The zone is predominantly characterised by harvested plantation forest, interspersed with narrow bands of remnant native vegetation, primarily along drainage lines.

Small, scattered patches of suitable habitat for the Southern Greater Glider, Squirrel Glider, and/or Yellow-bellied Glider have been mapped near Batlow Road, Nursery Access Road, Lower Bago Road, and between Wondalga Road and Adelong Creek Road. A more substantial area of glider habitat is also intersected east of the HumeLink T-intersection.

Five connectivity corridors were identified within this zone in the BDAR, three of which were confirmed as glider corridors (BON_2_64, SNO_GREH_1, and SNO_GREH_2). An additional five corridors (SNO_TG_1 to SNO_TG_5) have been identified for further consideration as potential glider crossing points. These additional corridors will be assessed during implementation of the HumeLink West Biodiversity Management Plan (BMP) Connectivity Strategy.

4.4.1.3. Maragle and Bago State Forest: Southern Greater Glider and Yellow-bellied Glider population on the Bago Plateau

The Maragle and Bago State Forest Glider Crossing Zone spans approximately 26 kilometres, extending from the southern extent of the HumeLink alignment near Elliot Way (Maragle) to Snubba Road in the north. This zone is characterised by extensive tall native forests that provide high-quality, known habitat for several threatened glider species, including the Southern Greater Glider, Yellow-bellied Glider (on the Bago Plateau), and the Squirrel Glider.

The Biodiversity Development Assessment Report (BDAR) identified twenty-eight connectivity corridors within this zone, all of which were assessed as being associated with glider habitat using the methods outlined in this assessment.

Existing habitat connectivity in the area is already influenced by cleared transmission easements associated with Transmission Lines 64 and 66. Based on proximity to these existing easements, the zone has been divided into three sub-sections:

- Southern section (parallel to Line 64): Over the southernmost 10 km, HumeLink runs parallel to Line 64, which has an existing easement approximately 60 metres wide. The HumeLink easement will result in a combined cleared corridor of approximately 130 metres. Fifteen BDAR connectivity corridors were identified in this sub-section.
- Central section (parallel to Lines 64 and 66): Approximately 10 km north of Maragle, Lines 64 and 66 converge, forming a shared easement approximately 130 metres wide over a 4.5 km stretch. Within this area, HumeLink will introduce an additional 70-metre-wide easement, resulting in a total cleared width of approximately 200 metres. Eight BDAR connectivity corridors were identified in this sub-section.
- Northern section (not parallel to other lines): Beyond the convergence point, HumeLink diverges westward for an additional 10 km, no longer running parallel to existing lines. This northern section maintains high existing habitat connectivity, and the introduction of the 70-metre-wide HumeLink easement is expected to introduce new barrier effects for glider movement. Four BDAR connectivity corridors were identified in this sub-section.

Given the limited evidence regarding the effectiveness of glider pole arrays for facilitating movement of target species across long cleared spans, the installation of under-transmission glider poles in this section will adopt an adaptive management approach. This may involve a staged installation of glider pole crossings at selected locations, followed by targeted monitoring to assess usage by the target glider species. Monitoring results should be used to inform the necessity and placement of additional poles.

Alternatively, documented evidence of successful glider pole usage from other Transgrid projects—such as the Snowy Transmission Project or Project EnergyConnect—may be used to inform design

and placement decisions within this section.

Table 4-3 Glider Crossing assessment

Corridor ID	Glider Connectivity Zone	Target species for glider crossings	Existing connectivity	Impact to existing connectivity	Likelihood glider poles required to maintain connectivity (desktop assessment)	Glider crossing recommendations
INL_23_92	Wagga Wagga to Green Hills State Forest	Squirrel Glider	Key riparian crossings	Connectivity impact - moderate	Possible	Not identified as Threatened Glider habitat, however located within landscape scale extent of the Squirrel Glider population within the Wagga Wagga LGA. Field verification to consider Glider Poles including under the adjacent transmission line.
INL_23_90	Wagga Wagga to Green Hills State Forest	Squirrel Glider	Key riparian crossings	Connectivity impact - high	Possible	Bionet record located on Tooles Creek ~2000m to east. Landscape connectivity around record maintained by clearing model.

Corridor ID	Glider Connectivity Zone	Target species for glider crossings	Existing connectivity	Impact to existing connectivity	Likelihood glider poles required to maintain connectivity (desktop assessment)	Glider crossing recommendations
INL_20_88	Wagga Wagga to Green Hills State Forest	Squirrel Glider	Non-functional corridor (parallel transmission lines)	Connectivity impact - moderate	Unlikely	Connectivity maintained by clearing model. Supplementary poles beneath existing TL to be assessed during field validation.
INL_17_86	Wagga Wagga to Green Hills State Forest	Squirrel Glider	Intact vegetation corridor	Connectivity maintained	Unlikely	Connectivity maintained by clearing model.
INL_17_85	Wagga Wagga to Green Hills State Forest	Squirrel Glider	Non-functional corridor (parallel transmission lines)	Connectivity maintained	Unlikely	Connectivity maintained by clearing model. Field verification to assess existing connectivity across TL to north between 500 - 1200m to east.

Corridor ID	Glider Connectivity Zone	Target species for glider crossings	Existing connectivity	Impact to existing connectivity	Likelihood glider poles required to maintain connectivity (desktop assessment)	Glider crossing recommendations
INL_17_83	Wagga Wagga to Green Hills State Forest	Squirrel Glider	Non-functional corridor (plantation)	Connectivity maintained	Unlikely	Current location unsuitable due to cleared plantation forest to the north. Field verification required to assess alternate location ~1400 m west for Squirrel Glider connectivity between towers..
INL_17_84	Wagga Wagga to Green Hills State Forest	Squirrel Glider	Fragmented vegetation corridor	Connectivity maintained	Unlikely	Corridor of scattered paddock trees along Turners Creek. Development will have minimal impact to existing connectivity.

Corridor ID	Glider Connectivity Zone	Target species for glider crossings	Existing connectivity	Impact to existing connectivity	Likelihood glider poles required to maintain connectivity (desktop assessment)	Glider crossing recommendations
SNO_TG_1	Green Hills State Forest	Greater Glider, Squirrel Glider	Fragmented vegetation corridor	Connectivity impact - high	Possible	Linear vegetation corridor through cleared landscape along Lower Bago Road. Potentially important connection for Squirrel and Greater Gliders. Review connectivity for Gliders based on Final Layout Plans.

Corridor ID	Glider Connectivity Zone	Target species for glider crossings	Existing connectivity	Impact to existing connectivity	Likelihood glider poles required to maintain connectivity (desktop assessment)	Glider crossing recommendations
SNO_TG_2	Green Hills State Forest	Greater Glider, Squirrel Glider	Fragmented vegetation corridor	Connectivity impact - high	Possible	Linear vegetation corridor through cleared landscape along Yaven Yaven Creek. Potentially important connection for Squirrel and Greater Gliders. Review connectivity for Gliders based on Final Layout Plans.
SNO_GREH_2	Green Hills State Forest	Greater Glider	Key riparian crossings	Connectivity impact - moderate	Possible	Recommend moving crossing 500m south to the Bago Creek crossing which provides better connectivity into the riparian network the Sailors Gully, Lower Bago Road and Batlow Road.

Corridor ID	Glider Connectivity Zone	Target species for glider crossings	Existing connectivity	Impact to existing connectivity	Likelihood glider poles required to maintain connectivity (desktop assessment)	Glider crossing recommendations
SNO_TG_3	Green Hills State Forest	Greater Glider, Squirrel Glider	Fragmented vegetation corridor	Connectivity impact - high	Possible	Linear vegetation corridor through cleared landscape along Germans Creek. Potentially important connection for Squirrel and Greater Gliders. Review connectivity for Gliders based on Final Layout Plans.

Corridor ID	Glider Connectivity Zone	Target species for glider crossings	Existing connectivity	Impact to existing connectivity	Likelihood glider poles required to maintain connectivity (desktop assessment)	Glider crossing recommendations
SNO_TG_4	Green Hills State Forest	Greater Glider, Squirrel Glider	Fragmented vegetation corridor	Connectivity impact - high	Possible	Linear vegetation corridor through cleared landscape along Adelong Creek. Potentially important connection for Squirrel and Greater Gliders. Review connectivity for Gliders based on Final Layout Plans.
SNO_GREH_3	Green Hills State Forest	Yellow-bellied Glider	Intact vegetation corridor	Connectivity impact - high	Possible	Assumed present and not bionet records, however could be providing linkage between larger patches of native vegetation within Bago SF.

Corridor ID	Glider Connectivity Zone	Target species for glider crossings	Existing connectivity	Impact to existing connectivity	Likelihood glider poles required to maintain connectivity (desktop assessment)	Glider crossing recommendations
SNO_TG_5	Green Hills State Forest	Greater Glider, Squirrel Glider	Fragmented vegetation corridor	Connectivity impact - high	Possible	Linear vegetation corridor through cleared landscape along Little Gilmore Creek. Potentially important connection for Squirrel and Greater Gliders. Review connectivity for Gliders based on Final Layout Plans.
BON_2_64	Green Hills State Forest	Greater Glider	Key riparian crossings	Connectivity maintained	Unlikely	The corridor is located to maintain connectivity along Adelong Creek where clearing is not required under the approved clearing area.

Corridor ID	Glider Connectivity Zone	Target species for glider crossings	Existing connectivity	Impact to existing connectivity	Likelihood glider poles required to maintain connectivity (desktop assessment)	Glider crossing recommendations
SNO_GREH_1	Maragle and Bago State Forest	Greater Glider & Yellow-bellied Glider	Intact vegetation corridor	Connectivity maintained	Likely	No parallel TM. Glider crossing to be assessed as part of the Bago State Forest connectivity review.
SNO_1_72	Maragle and Bago State Forest	Squirrel Glider	Fragmented vegetation corridor	Connectivity maintained	Unlikely	Connectivity maintained. This corridor crossed the existing Snubba Road only.
SNO_1_73	Maragle and Bago State Forest	Greater Glider & Yellow-bellied Glider	Intact vegetation corridor	Connectivity impact - high	Likely	No parallel TM. Glider crossing to be assessed as part of the Bago State Forest connectivity review.

Corridor ID	Glider Connectivity Zone	Target species for glider crossings	Existing connectivity	Impact to existing connectivity	Likelihood glider poles required to maintain connectivity (desktop assessment)	Glider crossing recommendations
SNO_1_74	Maragle and Bago State Forest	Greater Glider & Yellow-bellied Glider	Intact vegetation corridor	Connectivity impact - high	Likely	No parallel TM. Glider crossing to be assessed as part of the Bago State Forest connectivity review.
SNO_1_93	Maragle and Bago State Forest	Greater Glider & Yellow-bellied Glider	Intact vegetation corridor	Connectivity impact - high	Likely	No parallel TM. Glider crossing to be assessed as part of the Bago State Forest connectivity review.
SNO_1_94	Maragle and Bago State Forest	Greater Glider & Yellow-bellied Glider	Non-functional corridor (parallel transmission lines)	Connectivity impact - moderate	Likely	Bago State Forest Adjacent to TL 64 and 66 forming 200m wide easement. Glider crossing to be assessed as part of the Bago SF connectivity.

Corridor ID	Glider Connectivity Zone	Target species for glider crossings	Existing connectivity	Impact to existing connectivity	Likelihood glider poles required to maintain connectivity (desktop assessment)	Glider crossing recommendations
SNO_1_96	Maragle and Bago State Forest	Greater Glider & Yellow-bellied Glider	Non-functional corridor (parallel transmission lines)	Connectivity impact - high	Likely	Bago State Forest Adjacent to TL 64 and 66 forming 200m wide easement. Glider crossing to be assessed as part of the Bago SF connectivity.
SNO_1_97	Maragle and Bago State Forest	Greater Glider & Yellow-bellied Glider	Non-functional corridor (parallel transmission lines)	Connectivity impact - high	Likely	Bago State Forest Adjacent to TL 64 and 66 forming 200m wide easement. Glider crossing to be assessed as part of the Bago SF connectivity.

Corridor ID	Glider Connectivity Zone	Target species for glider crossings	Existing connectivity	Impact to existing connectivity	Likelihood glider poles required to maintain connectivity (desktop assessment)	Glider crossing recommendations
SNO_1_98	Maragle and Bago State Forest	Greater Glider & Yellow-bellied Glider	Non-functional corridor (parallel transmission lines)	Connectivity impact - high	Likely	Bago State Forest Adjacent to TL 64 and 66 forming 200m wide easement. Glider crossing to be assessed as part of the Bago SF connectivity.
SNO_1_75	Maragle and Bago State Forest	Greater Glider & Yellow-bellied Glider	Non-functional corridor (parallel transmission lines)	Connectivity impact - high	Possible	Bago State Forest Adjacent to TL 64 forming 120m wide easement. Glider crossing to be assessed as part of the Bago SF connectivity. This location will use the vegetation at the junction of the lines as a stepping stone.

Corridor ID	Glider Connectivity Zone	Target species for glider crossings	Existing connectivity	Impact to existing connectivity	Likelihood glider poles required to maintain connectivity (desktop assessment)	Glider crossing recommendations
SNO_1_99	Maragle and Bago State Forest	Greater Glider & Yellow-bellied Glider	Non-functional corridor (parallel transmission lines)	Connectivity impact - high	Likely	Bago State Forest Adjacent to TL 64 and 66 forming 200m wide easement. Glider crossing to be assessed as part of the Bago SF connectivity.
SNO_1_102	Maragle and Bago State Forest	Greater Glider & Yellow-bellied Glider	Non-functional corridor (parallel transmission lines)	Connectivity impact - high	Possible	Bago State Forest Adjacent to TL 64 and 66 forming 200m wide easement. Glider crossing to be assessed as part of the Bago SF connectivity.

Corridor ID	Glider Connectivity Zone	Target species for glider crossings	Existing connectivity	Impact to existing connectivity	Likelihood glider poles required to maintain connectivity (desktop assessment)	Glider crossing recommendations
SNO_1_100	Maragle and Bago State Forest	Greater Glider & Yellow-bellied Glider	Non-functional corridor (parallel transmission lines)	Connectivity impact - high	Possible	Bago State Forest Adjacent to TL 64 and 66 forming 200m wide easement. Glider crossing to be assessed as part of the Bago SF connectivity.
SNO_1_101	Maragle and Bago State Forest	Greater Glider & Yellow-bellied Glider	Non-functional corridor (parallel transmission lines)	Connectivity impact - high	Possible	Bago State Forest Adjacent to TL 64 and 66 forming 200m wide easement. Glider crossing to be assessed as part of the Bago SF connectivity.

Corridor ID	Glider Connectivity Zone	Target species for glider crossings	Existing connectivity	Impact to existing connectivity	Likelihood glider poles required to maintain connectivity (desktop assessment)	Glider crossing recommendations
SNO_1_76	Maragle and Bago State Forest	Greater Glider & Yellow-bellied Glider	Non-functional corridor (parallel transmission lines)	Connectivity impact - high	Possible	Bago State Forest Adjacent to TL 64 forming 120m wide easement. Glider crossing to be assessed as part of the Bago SF connectivity. This location will use the vegetation at the junction of the lines as a stepping stone.

Corridor ID	Glider Connectivity Zone	Target species for glider crossings	Existing connectivity	Impact to existing connectivity	Likelihood glider poles required to maintain connectivity (desktop assessment)	Glider crossing recommendations
SNO_1_103	Maragle and Bago State Forest	Greater Glider & Yellow-bellied Glider	Non-functional corridor (parallel transmission lines)	Connectivity impact - high	Possible	Bago State Forest Adjacent to TL 64 forming 120m wide easement. Glider crossing to be assessed as part of the Bago SF connectivity. This location will use the vegetation at the junction of the lines as a stepping stone.

Corridor ID	Glider Connectivity Zone	Target species for glider crossings	Existing connectivity	Impact to existing connectivity	Likelihood glider poles required to maintain connectivity (desktop assessment)	Glider crossing recommendations
SNO_1_104	Maragle and Bago State Forest	Greater Glider & Yellow-bellied Glider	Non-functional corridor (parallel transmission lines)	Connectivity impact - high	Possible	Bago State Forest Adjacent to TL 64 forming 120m wide easement. Glider crossing to be assessed as part of the Bago SF connectivity. This location will use the vegetation at the junction of the lines as a stepping stone.

Corridor ID	Glider Connectivity Zone	Target species for glider crossings	Existing connectivity	Impact to existing connectivity	Likelihood glider poles required to maintain connectivity (desktop assessment)	Glider crossing recommendations
SNO_1_105	Maragle and Bago State Forest	Greater Glider & Yellow-bellied Glider	Non-functional corridor (parallel transmission lines)	Connectivity impact - high	Possible	Bago State Forest Adjacent to TL 64 forming 120m wide easement. Glider crossing to be assessed as part of the Bago SF connectivity. This location will use the vegetation at the junction of the lines as a stepping stone.

Corridor ID	Glider Connectivity Zone	Target species for glider crossings	Existing connectivity	Impact to existing connectivity	Likelihood glider poles required to maintain connectivity (desktop assessment)	Glider crossing recommendations
SNO_1_106	Maragle and Bago State Forest	Greater Glider & Yellow-bellied Glider	Non-functional corridor (parallel transmission lines)	Connectivity impact - high	Possible	Bago State Forest Adjacent to TL 64 forming 120m wide easement. Glider crossing to be assessed as part of the Bago SF connectivity. This location will use the vegetation at the junction of the lines as a stepping stone.

Corridor ID	Glider Connectivity Zone	Target species for glider crossings	Existing connectivity	Impact to existing connectivity	Likelihood glider poles required to maintain connectivity (desktop assessment)	Glider crossing recommendations
SNO_1_107	Maragle and Bago State Forest	Greater Glider & Yellow-bellied Glider	Non-functional corridor (parallel transmission lines)	Connectivity impact - high	Possible	Bago State Forest Adjacent to TL 64 forming 120m wide easement. Glider crossing to be assessed as part of the Bago SF connectivity. This location will use the vegetation at the junction of the lines as a stepping stone.

Corridor ID	Glider Connectivity Zone	Target species for glider crossings	Existing connectivity	Impact to existing connectivity	Likelihood glider poles required to maintain connectivity (desktop assessment)	Glider crossing recommendations
SNO_1_108	Maragle and Bago State Forest	Greater Glider & Yellow-bellied Glider	Non-functional corridor (parallel transmission lines)	Connectivity impact - high	Possible	Bago State Forest Adjacent to TL 64 forming 120m wide easement. Glider crossing to be assessed as part of the Bago SF connectivity. This location will use the vegetation at the junction of the lines as a stepping stone.

Corridor ID	Glider Connectivity Zone	Target species for glider crossings	Existing connectivity	Impact to existing connectivity	Likelihood glider poles required to maintain connectivity (desktop assessment)	Glider crossing recommendations
SNO_1_77	Maragle and Bago State Forest	Greater Glider & Yellow-bellied Glider	Non-functional corridor (parallel transmission lines)	Connectivity impact - high	Possible	Bago State Forest Adjacent to TL 64 forming 120m wide easement. Glider crossing to be assessed as part of the Bago SF connectivity. This location will use the vegetation at the junction of the lines as a stepping stone.

Corridor ID	Glider Connectivity Zone	Target species for glider crossings	Existing connectivity	Impact to existing connectivity	Likelihood glider poles required to maintain connectivity (desktop assessment)	Glider crossing recommendations
SNO_1_109	Maragle and Bago State Forest	Greater Glider & Yellow-bellied Glider	Non-functional corridor (parallel transmission lines)	Connectivity impact - high	Possible	Bago State Forest Adjacent to TL 64 forming 120m wide easement. Glider crossing to be assessed as part of the Bago SF connectivity. This location will use the vegetation at the junction of the lines as a stepping stone.

Corridor ID	Glider Connectivity Zone	Target species for glider crossings	Existing connectivity	Impact to existing connectivity	Likelihood glider poles required to maintain connectivity (desktop assessment)	Glider crossing recommendations
SNO_1_110	Maragle and Bago State Forest	Greater Glider & Yellow-bellied Glider	Non-functional corridor (parallel transmission lines)	Connectivity impact - high	Possible	Bago State Forest Adjacent to TL 64 forming 120m wide easement. Glider crossing to be assessed as part of the Bago SF connectivity. This location will use the vegetation at the junction of the lines as a stepping stone.
SNO_1_111	Maragle and Bago State Forest	Greater Glider & Yellow-bellied Glider	Non-functional corridor (parallel transmission lines)	Connectivity impact - high	Possible	Bago State Forest. Adjacent to TL 64 easement at break in HL.

Corridor ID	Glider Connectivity Zone	Target species for glider crossings	Existing connectivity	Impact to existing connectivity	Likelihood glider poles required to maintain connectivity (desktop assessment)	Glider crossing recommendations
SNO_1_112	Maragle and Bago State Forest	Greater Glider & Yellow-bellied Glider	Non-functional corridor (parallel transmission lines)	Connectivity impact - high	Possible	Bago State Forest Adjacent to TL 64 forming 120m wide easement. Glider crossing to be assessed as part of the Bago SF connectivity. This location will use the vegetation at the junction of the lines as a stepping stone.

Corridor ID	Glider Connectivity Zone	Target species for glider crossings	Existing connectivity	Impact to existing connectivity	Likelihood glider poles required to maintain connectivity (desktop assessment)	Glider crossing recommendations
SNO_1_113	Maragle and Bago State Forest	Greater Glider & Yellow-bellied Glider	Non-functional corridor (parallel transmission lines)	Connectivity impact - high	Possible	Bago State Forest Adjacent to TL 64 forming 120m wide easement. Glider crossing to be assessed as part of the Bago SF connectivity. This location will use the vegetation at the junction of the lines as a stepping stone.

Corridor ID	Glider Connectivity Zone	Target species for glider crossings	Existing connectivity	Impact to existing connectivity	Likelihood glider poles required to maintain connectivity (desktop assessment)	Glider crossing recommendations
SNO_1_78	Maragle and Bago State Forest	Greater Glider & Yellow-bellied Glider	Non-functional corridor (parallel transmission lines)	Connectivity impact - high	Possible	Bago State Forest Adjacent to TL 64 forming 120m wide easement. Glider crossing to be assessed as part of the Bago SF connectivity. This location will use the vegetation at the junction of the lines as a stepping stone.

4.4.2. Design

The glide ability of the target Glider species, along with other species-specific behavioural considerations, must be taken into account when designing glider crossing zones:

- Squirrel Glider (Goldingay and Taylor, 2009):
 - Average glide angle = $28.5 \pm 0.8^\circ$.
 - Average glide ratio (distance/height loss) = 1.84 m.
- Yellow-bellied Glider (Goldingay, 2014; Jackson, 2002):
 - Average glide angle = 27.3° .
 - Average glide ratio = 2 m (when gliding from a height of 18.5 m above ground)
- Southern Greater Glider (Dr. Ana Gracanin, personal communication, 3/04/2025):
 - Average glide angle = 44.58° .
 - Average glide ratio = 1.04 m.

The maximum glide distances achieved by these Gliders depends on launch/landing heights and tree height, as well as landscape positioning. Gliders typically launch from 2-3 m below the canopy height and land ≥ 5 m above ground (Goldingay, 2014; Goldingay and Taylor, 2009; Jackson, 2002).

The glide ratios indicate that the Squirrel Glider and Yellow-bellied Glider can travel farther per glide, therefore the design of Glider poles has been developed to achieve the minimum requirements of the Southern Greater Glider (glide ratio of 1.04). For a 12 m tall Glider pole, a Southern Greater Glider could launch from a launching pad (1 m below the top of the pole) and land at the bottom of the next pole at a distance of 11.44 m. However, Gliders land at ≥ 5 m above the ground therefore, the maximum distance a Southern Greater Glider could achieve would be 6.24 m (rounded down = 6 m). As a result, a large number of Glider poles will be required along the transmission easement, spaced at a maximum of 6 m apart.

There are no examples in the literature of Gliders utilising numerous poles across a gap. The expanse of open ground, along with potential abiotic effects, may deter Gliders from using the poles. As such, the use of the poles by Gliders is not guaranteed, and the monitoring program defined in Section 5 will assess the efficacy of this design.

Guidelines to be considered for the installation of 12 m tall Glider poles is provided in Table 4-4 below. Ongoing retention of large trees within the HTZ will occur that intersect glider corridors, subject to regular arboricultural assessment and ongoing tree maintenance/ pruning to minimise any safety risks.

Table 4-4 Glider pole design considerations

Consideration	Height	Comment
Height of Glider pole	12 m	Maximum pole height.
Height of launch	11 m	Launch pad should be placed 1 m below the top of the Glider pole.
Height of landing	5 m above ground	Based on literature review (Goldingay, 2014; Goldingay and Taylor, 2009; Jackson, 2002).

Consideration	Height	Comment
Achievable glide distance	6 m	Glider poles to be spaced at a maximum of 6 m apart. Pole spacing adjacent to retained vegetation may be greater, pending tree height of retained trees > 12 m.
Unique identifier	1-2 m above ground	A unique Glider pole identification number will be placed on the pole as a high-visibility marker.
Material	N/A	Non-conductive material due to proximity to conductors and the potential arcing risk.

An example of a Glider pole array is displayed in Plate 4-1. Each terminating glider pole (one at each end of the Glider Crossing) will be fitted with a motion detection monitoring camera to assist with ongoing monitoring.

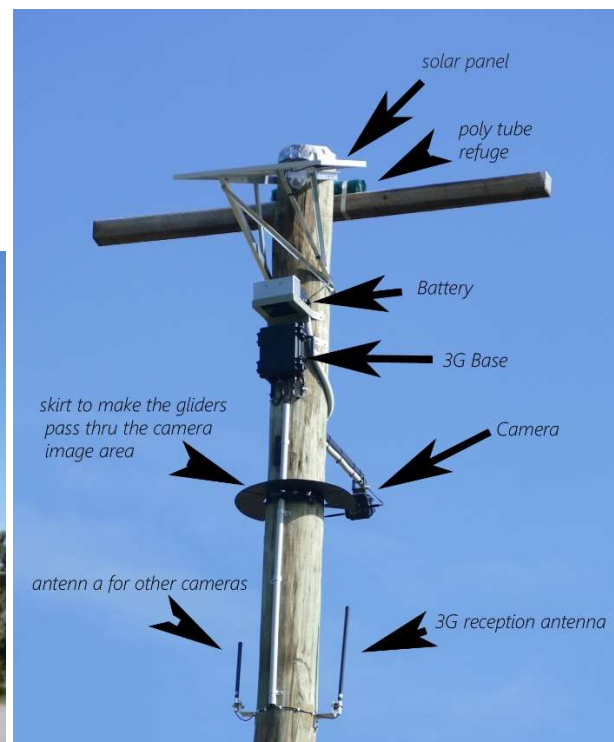


Plate 4-1 Example Glider pole array (left) and launching pad with monitoring camera (right) (Kylie et al., 2015; Wildlife Preservation Society of Queensland, 2025)

4.5. Final selection process

4.5.1. Desktop review

A desktop review will be completed following the methods in the Transgrid Connectivity Review Letter (July, 2025) and the revised clearing footprints and final layout plans to guide the final location and design of Ground Corridors and Glider Crossings. It will confirm the assumptions regarding impact to connectivity for the target species based on the revised disturbance area. This should be conducted by a suitably qualified and experienced ecologist. The desktop review will guide field surveys detailed below.

4.5.2. Field surveys

Field surveys will be undertaken by a suitably qualified ecologist (minimum of two-year's experience) to confirm locations for Ground Corridors and Glider Crossings with reference to ground conditions. 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. In the event that the glider expert is unavailable the project ecologist will, where practicable, reschedule the survey or where an unreasonable delay would occur the project ecologist will provide a preliminary report for comment. Field surveys must be complete a minimum of 4 weeks prior to clearing works commencing and will involve the following methods:

- Confirm site values against Ground Corridor selection principles (refer Section 4.2.1.1), Glider Crossing design considerations (Section 4.2.2.1), indicative corridors and threatened species records.
- Validate selection and/or recommend necessary changes to connectivity corridors.
- Assess proximity to existing easements (Line 64 and 66) and retained vegetated gaps between easements.
- Identify the IBRA region and any associated previously mapped corridor number, the overall size of the corridor, logs, rocky outcrops, waterways, known species records, riparian areas, and proximity to a national park, nature reserve or stewardship site.
- Identify additional connectivity impairments (i.e., roads, tracks, waterways).
- Record retained trees within 20 m either side of the HLW easement, noting the following characteristics:
 - Species.
 - Height.
 - Diameter at Breast Height (DBH).
 - Canopy spread.
 - Distance from adjacent trees.
 - Potential Glider nest trees.
 - GPS location and photos.

The results of ground truthing surveys will be incorporated into a Corridor Inspection Report (detailed below).

4.5.3. Corridor Inspection Report

A Corridor Inspection Report will be prepared following desktop review and field surveys detailed above, at least one month prior to clearing commencing around the corridors. This must be prepared by a suitably qualified ecologist (minimum 2-years' experience) and be submitted to CPHR to demonstrate that the objectives of the connectivity strategy and the 29 July 2025 dated connectivity corridor review letter have been met.

The report will involve an assessment of assumptions made in the Transgrid Connectivity Review Letter (July, 2025) based on the final layout plans and field surveys to determine site-specific recommendations. The report will outline Ground Corridor and Glider Crossing locations and dimensions based on revised clearing footprints, final layout plans, selection principles (Section 4.2.1.1) and Glider design considerations (Section 4.2.2.1). Reports will detail; recommendations for protecting connectivity corridors during and after construction, the placement of any connectivity enhancement features and how connectivity will be maintained for glider species in the locations of glider poles pending their installation.

Where the BDAR connectivity corridors are found to be unsuitable, alternate locations should be

recommended. Additional suitable corridors may also be added and utilised.

Where connectivity will be maintained by retained vegetation, this must be confirmed and reported by the Project Ecologists. If this is incorrect, then recommendations should be made for these crossings to maintain connectivity for the target species.

4.5.4. Glider pole design

The results of the Corridor Inspection Report will then inform detailed design to check locations of final Glider Crossings against the tower and conductor locations, allow safety in design reviews and acceptance from asset management. This will include locations, pole heights and the required number of poles based on documented glide performance including glide angles, distances and heights (refer Section 4.2.2.1) for the identified species. Consultation with CPHR and relevant Glider experts will occur as part of this process and must be completed prior to the commencement of clearing around corridors.

4.6. Collision-risk

4.6.1. Collision risk deterrents

To minimise the risk of bird and bat collisions with transmission lines, TransGrid will prepare a Conductor Line-Marking Plan in consultation with CPHR. The outcomes of the Plan will be incorporated into the BMP upon finalisation. The plan will be spatially explicit and will identify all high-risk spans, device type, placement, and spacing.

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 and
- Microbats

The review will incorporate:

- Updated species distribution and movement 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, wetland approaches, known roosts/nests)
- 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 Conductor Line-Marking Plan, with the outcomes included in the BMP.

- This Plan will:
 - Confirm locations where conductor line-marking deterrent devices will be installed, applying clear spatial parameters:
 - 500 m from significant water bodies
 - 1 km from large wetlands, estuaries, or known roost/nest complexes
 - Spans crossing mapped riparian corridors or within 250m of wetlands or floodplains
 - Ridge-to-ridge or valley funnel spans used as known flightlines

- Spans within 1 km of known or potential raptor nests (including those identified in pre-clearing surveys) 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
- Detail protection measures, maintenance requirements, and monitoring commitments.

4.6.2. Collision risk measures

Vehicle strike and conductor line collision risk reduction measures will be considered during detailed design and implemented during construction as follows:

- Choose conductor line-marking technique (refer below).
- Work scheduling – minimised night works to the extent possible, staging and timing of habitat clearing in accordance with Annexure B: Clearing Protocol of the HLW BMP.
- Lighting:
 - Directional lighting will be used for any permanent lighting (i.e., substations) or temporary lighting (i.e., worker's accommodation) required to minimise light spill 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 furthest extent practicable. Permanent lighting will be erected at least 50 m from remnant vegetation where practicable.
- Speed limits, implementation of Annexure D: Unexpected Finds Procedure and Annexure B: Clearing Protocol for appropriate fauna handling in case of vehicular collisions.
- Dismantlement of raptor nests (when not in use) in accordance with Annexure C: Hollow and Nest Strategy of the HLW BMP to reduce collision risk for raptors.
- Education and training programs in accordance with Section 7.4 of the HLW BMP.
- Enhanced signage and visibility – high-visibility road signage will be installed in areas known to have high wildlife activity. This may include signage indicating the presence of large fauna (e.g., kangaroos, wombats) and direct drivers to reduce speed during certain times of day or seasons when collisions are more likely.
- Construction best practices – construction practices will be implemented that minimise disruption to wildlife and reduce collision risk, including fencing or netting around construction zones to deter wildlife from entering high-risk areas.
- Monitoring and reporting of wildlife roadkill – all wildlife collisions will be reported in accordance with Annexure B: Clearing Protocol (Attachment 3: Fauna handling record sheet) of the HLW BMP to track the frequency and locations of wildlife collisions. This will help identify high-risk areas for fauna. Where multiple collisions occur at a location the track will be targeted for additional mitigation efforts such as the installation of an underpass (preferred option).
- Road and habitat restoration – in accordance with Annexure G: Rehabilitation Plan of the HLW BMP, any access roads not necessary for operations will be rehabilitated, in line with the relevant Property Management Plan, to encourage wildlife to move back to safer, more natural routes away from roads or transmission lines.
- Wildlife deterrents (e.g., fencing) – wildlife-proof fencing will be considered in areas known to have high wildlife activity to reduce the likelihood of animals entering dangerous areas.

4.6.3. Conductor line-marking techniques

Per UMM B11, conductor line-marking techniques are to be considered during design refinement to minimise bird and bat strike. 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 to determine the location and type of adaptive

management measures for collision-risk species. Deterrent strategies would include conductor line-marking deterrents designed to improve visibility of transmission lines for avifauna and flying-foxes.

The review will be completed in consultation with CPHR and documented in a Conductor Line-Marking Plan. The plan will be spatially explicit and will identify all high-risk spans ('hot-spots'), device type, placement, and spacing. The outcomes of the Plan will be included in the Connectivity Strategy upon finalisation. The installation of conductor line markers will occur within 1 month following installation of OPGW / OHEW.

4.7. Summary of connectivity strategy measures

All connectivity measures outlined in this strategy have been summarised in Table 4-6 below. These specific management and mitigation measures have been developed to address the relevant requirements of applicable legislation, the MCoA, the CoMA, the UMMs and all Planning Approval Documentation, particularly the Revised BDAR. A summary of all management and mitigation measures relevant to the HLW BMP is provided in Section 7.12 of the BMP.

Table 4-5 Connectivity management and mitigation measures

ID	Measure/Requirement	When to implement	Responsibility	Reference	Evidence
BMP20	Retention of ground, shrub and habitat resources will be prioritised in areas of partial clearing (ECZ & HTZ).	Pre-construction and Construction	Environmental Manager Design Manager Construction Manager Supervisor Engineer	MCoA B25, B30 CoMA 2, 7 UMM B3, B6, B10, B11, B28	Post-clearing Reports
BMP21	Desktop review of connectivity corridors (Ground Corridors & Glider Crossings) to be followed by field surveys. Corridor Inspection Report prepared prior to clearing commencing, and is to include an assessment of assumptions made in this strategy and the desktop review, final corridor locations/dimensions and any associated recommendations.	Pre-construction	Environmental Representative Suitably qualified ecologist	MCoA B25, B30 CoMA 2, 7 UMM B3, B6, B10, B11, B28	Corridor Inspection Report

ID	Measure/Requirement	When to implement	Responsibility	Reference	Evidence
BMP22	As many Ground Corridors that can be successfully retained/established will be identified and protected via delineation and clearing restrictions.	Pre-construction and construction	Environmental Representative Project Ecologist	MCoA B25, B30 CoMA 2, 7 UMM B3, B6, B10, B11, B28	Corridor Inspection Report Post-clearing Reports
BMP23	As many Glider Crossings that can be successfully retained/established will be identified and undergo detailed design to identify locations, pole heights and the required number of poles based on documented glide performance including glide angles, distances and heights. Glider pole arrays to be installed within 3 months of final clearing.	Pre-construction and construction	Environmental Representative Construction Manager Project Ecologist	MCoA B25, B30 CoMA 2, 7 UMM B3, B6, B10, B11, B28	Corridor Inspection Report Glider Pole Installation Report
BMP24	Conductor line-markers to be installed at select locations and areas identified as higher strike risk following detailed design.	Detailed design and construction	Environmental Representative Construction Manager Project Ecologist	MCoA B25, B30 CoMA 2, 7 UMM B3, B6, B10, B11, B28	Detailed design and Project Ecologist confirmation

5. Compliance management

5.1. Monitoring

Monitoring of this strategy will occur during construction of HLW to determine the efficacy of connectivity measures, as detailed below. Monitoring will continue for 5 years post-installation, to be incorporated into the Operational Biodiversity Management Plan by Transgrid.

5.1.1. Ground Corridors

To monitor the efficacy of Ground Corridors, qualitative assessments of habitat values will be conducted biannually by the Project Ecologist. Ground Corridor monitoring is to continue through construction, until Transgrid operational monitoring phase begins. Each spring and autumn, monitoring will assess:

- Type, condition and extent of retained vegetation.
- Extent of disturbance within the corridor including weeds, clearing works, fragmentation from access tracks/roads and evidence of pest use.
- Delineation of corridors.

- Need for corrective actions (i.e., delineation, pest management, weed management, rehabilitation).

5.1.2. Glider Crossings

Terminating glider poles (one at each end of the Glider Crossing) will be fit with one motion detecting camera. These will be set to record continuously for the entire year, with data analysis to target three months of the year during the construction period, including the target Glider species breeding periods:

1. Greater Glider = March
2. Squirrel Glider & Yellow-bellied Glider = September

Monitoring will continue for 5 years post-installation, to be incorporated into the Operational Biodiversity Management Plan by Transgrid. Motion detecting cameras will be set to record 10 photos per motion trigger with a one second interval between images, and a quiet period of 30 second between triggers, set to record continuously. Successful Glider pole use will be determined through detection of Gliders on both terminating poles.

5.2. Reporting

5.2.1. Pre-clearing Report

Pre-clearing Reports will include an assessment of Ground Corridors established within a clearing permit area. The following will be reported on:

- Final location of established Ground Corridors, including GPS coordinates and figures.
- Width of corridor.
- Plant Community Types (PCTs) present within the corridor.
- Habitat features present and expected target species that will utilise the corridor.
- Assessment of incidents and non-compliances based on the TARP in Section 5.3.

5.2.2. Glider Pole Installation Report

The Glider Pole Installation Report will detail all Glider pole arrays installed for HLW. This report will be prepared by a suitably qualified ecologist (minimum 2-years' experience) following the installation of necessary Glider poles. The following minimum requirements are to be included in the Glider Pole Installation Report:

- Location of Glider pole array installations, including GPS coordinates and Unique Glider Pole IDs. Figures to be provided to display array locations.
- Number of poles installed at each Glider Crossing, including span of the array (m).
- Glider pole design specifications (i.e., pole, launch and landing height).
- Date of installation.
- Monitoring camera deployment details (e.g., height, exact location, angle) including installers.
- Assessment of incidents and non-compliances based on the TARP in Section 5.3.

5.2.3. Monitoring reports

During construction, monitoring data (as detailed in Section 5.1) will be provided to Transgrid as part of regular environmental reports, specifically:

- Biannually in spring and autumn = qualitative assessments of habitat values within connectivity corridors.
- Annually = results of glider pole camera monitoring.

Biannual Connectivity Monitoring Reports will be prepared and submitted to Transgrid as soon as they are available, including the following:

- Results of spring Ground Corridor monitoring.
- Results of 3 months Glider pole camera data analysis period.
- Qualitative assessments of habitat values within Ground Corridors.
- Assessment of glider utilisation of glider poles.
- Assessment of the overall success of the mitigation measures installed.
- Identification of gaps/limitations to the connectivity 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.
- Details of any non-conformances, including recommended corrective measures. Incidents and non-compliances
- Findings of carcass searches.

It is possible that Gliders will be reluctant to cross such large gaps, even with the assistance of Glider poles. Additional abiotic impacts may affect Gliders' ability to cross the easement, such as increased wind and precipitation. The monitoring program detailed above will be undertaken as part of the continual improvement process of this strategy. If there is no indication of successful crossings after 12-months (from camera data), further action may be required. Non-conformances, incident reporting and subsequent investigation will be undertaken as required in accordance with the Trigger Action Response Plan (TARP) provided in Table 5-1 below. HLWJV will promptly advise Transgrid on events that are non-conforming with this strategy. Where the monitoring commitment is beyond the construction timeline, monitoring procedures and commitments will be novated to the Operational Environmental Management Plan.

Table 5-1 Connectivity strategy TARP

Objective	Target	Performance indicator	Method of monitoring	Frequency	Trigger	Action/response plan
Maintain landscape connectivity for fauna.	Ground Corridors established and retained.	Retention of Ground Corridors within designated areas.	Pre-clearing Survey	Once, before clearing in an area.	Corridor cleared, narrowed or fragmented >10% of final Ground Corridor limits.	Stop works. Review vegetation clearing against GIS. Re-establish linkage via planting or adjust corridor route.
	Vegetation and habitat features support fauna movements	Groundcover, shrubs and habitat resources present and connected.	Post-clearing Report Ground Corridor Monitoring	Annually	Groundcover, shrub and habitat resource impacts >10% compared to baseline. Evidence of pest use.	Rehabilitate native ground layer and shrubs. Monitor regrowth. Undertake pest control.

Objective	Target	Performance indicator	Method of monitoring	Frequency	Trigger	Action/response plan
	Glider poles installed at correct locations, heights and numbers.	Glider poles installed within 3 months of clearing at final Glider crossing zone locations. Cameras installed at terminating poles (one at each end of the corridor).	Glider Pole Installation Report	Once, following the installation of necessary Glider poles.	Correct number of Glider poles not installed within 3 months of clearing works at that location. Remote cameras not installed at each glider pole.	Halt nearby works. Determine why poles and/or cameras cannot be installed, address any barriers and complete installation. Reinspect to confirm installation has been complete.
	Poles show evidence of use within 2 years.	Remote cameras show evidence of pole use by Gliders.	Glider pole camera monitoring.	Annually	No Glider evidence after 2 full breeding seasons.	Review pole spacing and height. Assess surrounding vegetation. Conduct additional Glider surveys in areas surrounding Glider Crossings to compare Glider activity. Development of a mitigation plan in consultation with NSW DCCEW Environment and Heritage, addressing causes of decline as determined in initial investigation. This may include

Objective	Target	Performance indicator	Method of monitoring	Frequency	Trigger	Action/response plan
						increased monitoring or additional construction related mitigation measures.
Reduce the spread of invasive species within connectivity corridors.	Invasive species are managed within Ground Corridors.	No new weeds established.	Ongoing weed monitoring per Annexure E: Biosecurity Management Plan	Annually	New weed species/location identified within Ground Corridor.	Report new weed presence to Transgrid. Develop and implement weed management options to control new weeds. Investigate the source of weed spread and implement improvements to weed management measures. Transgrid will report any new weed presence to NSW DPI, if the species is a Prohibited Matter such as <i>Parthenium hysterophorus</i>.
Reduce collision risk for birds and bats.	Conductor line-markers installed at designated spans.	Visual diverters installed and visible.	Reported incidents during construction will be undertaken in accordance with Annexure B: Clearing	Ongoing	Any collision of target threatened species.	Report incident, investigate cause (i.e., lighting, visibility). Revise converter type or span.

Objective	Target	Performance indicator	Method of monitoring	Frequency	Trigger	Action/response plan
			Protocol.			
	Post-installation monitoring of performance measures 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.	If collision incidents persist above a defined threshold (to be set in consultation with CPHR), increase device density, mark additional wires, or extend treated span length. (at the next available transmission line de-energisation)	Carcass searches, during construction (post stringing) will be undertaken by the project ecologists, post construction will be outlined in the TransGrid operational management plan	6 monthly	Any collision of target threatened species	Project ecologist If collision of threatened species persist the TG Asset Manager will organise installation of additional line marking at the next available scheduled de-energisation.

6. References

- Anderson, J., Law, B., and Tidemann, C. (2006). *Stream use by the large-footed myotis Myotis macropus in relation to environmental variables in northern New South Wales*. Australian Mammalogy 28: 15-26
- Chambers & Keatley (2010). *Australian bird phenology: a search for climate signals*. Austral Ecology, 35: 969-979
- Clarke & White (2008). *Management of Power Line Easement Vegetation for Small Mammal Conservation in Australia: A Case Study of the Broad-Toothed Rat (Mastacomys fuscus)*. The Eighth International Symposium on Environmental Concerns in Rights-of-Way Management, DOI:10.1016/B978-044453223-7.50057-5
- Department of Agriculture, Water and the Environment (DAWE) (2022a). *Conservation Advice for Petaurus australis australis (yellow-bellied glider (south-eastern))*. Canberra: Department of Agriculture, Water and the Environment.
- Department of Agriculture, Water and the Environment (DAWE) (2022b). *Conservation Advice for Phascolarctos cinereus (Koala) combined populations of Queensland, New South Wales and the Australian Capital Territory*. Canberra: Department of Agriculture, Water and the Environment
- Department of Climate Change, Energy, the Environment and Water (DCCEEW – Cth) (2021). *Conservation advice for Chalinolobus dwyeri (large-eared pied bat)*. Canberra: Department of Climate Change, Energy, the Environment and Water.
- Department of Climate Change, Energy, the Environment and Water (DCCEEW – Cth) (2022). *Conservation Advice for Petauroides volans (greater glider (southern and central))*. Canberra: Department of Climate Change, Energy, the Environment and Water.
- Department of Climate Change, Energy, the Environment and Water (DCCEEW – Cth) (2023a). *Conservation Advice for Climacteris picumnus victoriae (brown treecreeper (south-eastern))*. Canberra: Department of Climate Change, Energy, the Environment and Water
- Department of Climate Change, Energy, the Environment and Water (DCCEEW – Cth) (2023b). *Conservation Advice for Mastacomys fuscus mordicus (broad-toothed rat (mainland))*. Canberra: Department of Climate Change, Energy, the Environment and Water
- Department of Climate Change, Energy, the Environment and Water (DCCEEW – NSW) (2025). *BioNet Atlas of NSW Wildlife*
- Department of Planning and Environment [DPE] (2022). *Koala (Phascolarctos cinereus) Biodiversity Assessment Method Survey Guide*
- Department of Planning, Industry and Environment [DPIE] (2020). *Biodiversity Assessment Method*
- Department of Planning, Industry and Environment [DPIE] (2021). *NSW Survey Guide for Threatened Frogs, A guide for the survey of threatened frogs and their habitats for the Biodiversity Assessment Method*
- ECL Power Services (2025). ECL POWER SERVICES – Level 3 ASP safety hurdle. Retrieved from: <https://eclpowerservices.com.au/ecl-power-services-level-3-asg-safety-hurdle/>
- Goldingay (2012) *Characteristics of tree hollows used by Australian arboreal and scansorial mammals*. Australian Journal of Zoology 59, 277–294.
- Goldingay (2014). *Gliding performance in the yellow-bellied glider in low-canopy forest*. Australian Mammalogy 36, 254-258.
- Goldingay & Brendan (2009). *Gliding performance and its relevance to gap crossing by the squirrel glider (Petaurus norfolcensis)*. Australian Journal of Zoology 57, 99-104.
- Gonsalves, L., & Law, B. (2017). *Distribution and key foraging habitat of the large-footed myotis*

- Myotis macropus* in the highly modified Port Jackson estuary, Sydney, Australia: an overlooked, but vulnerable bat. *Australian Zoologist*, 38(4), 629-642
- Hartley, R., Blanchard, W., Clemann, N., Schroder, M., Schulz, M., Lindenmayer, D. B., & Scheele, B. C. (2023). *Rare but not lost: Endemic mountain lizard occupancy following megafire and grazing disturbances*. *Austral Ecology*, 48(8), 1921-1940.
- Herr (1998). *Aspects of the ecology of insectivorous forest-dwelling bats (Microchiroptera) in the western slopes of the Australian alps*. 10.13140/RG.2.2.12708.94087/1
- Howland, B. W., Stojanovic, D., Gordon, I. J., Fletcher, D., Snape, M., Stirnemann, I. A., & Lindenmayer, D. B. (2016). *Habitat preference of the striped legless lizard: implications of grazing by native herbivores and livestock for conservation of grassland biota*. *Austral Ecology*, 41(4), 455-464.
- Law, Chidel, Britton & Brassil (2013). *Response of eastern pygmy possums, Cercartetus nanus, to selective logging in New South Wales: home range, habitat selection and den use*. *Wildlife Research* 40, 470-481.
- Menkhorst & Lumsden (1995). *Eastern False Pipistrelle*. *Falsistrellus tasmaniensis* (Gould, 1858). In P. W. Menkhorst (ed). *Mammals of Victoria*: 178- 179
- Menkhorst, P., & Broome, L. (2006). *Background and Implementation Information for the Smoky Mouse Pseudomys Fumeus: National Recovery Plan*. Department of Sustainability and Environment
- Niche Environment and Heritage Pty Ltd [Niche] (2023). *Re: 8196 – HumeLink connectivity opportunities for gliders*. Letter memo.
- Niche (2024). *HumeLink Biodiversity Development Assessment Report EIS Technical Report 1*. Rev 0, June 2024.
- NSW Scientific Committee (2008). *Squirrel Glider Petaurus norfolcensis*, Review of Current Information in NSW
- NSW Scientific Committee (2010). *Varied sittella (Daphoensitta chrysoptera) - vulnerable species listing*.
- NSW Scientific Committee (2021). *Eastern pygmy-possum (Cercartetus nanus) - vulnerable species listing*.
- NSW Scientific Committee (2023). *Sloane's Froglet Crinia sloanei Littlejohn (1958) - Endangered Species listing*
- Robinson (1992). *Habitat use and foraging behaviour of the scarlet robin and the flame robin at a site of breeding-season sympatry*. *Wildlife Research* 19, 377-395.
- Rus, McArthur, Mella, V.S.A. & Crowther (2021). *Habitat fragmentation affects movement and space use of a specialist folivore, the koala*. *Anim Conserv*, 24: 26-37.
- Soanes, Vesk & Van der Ree (2015). *Monitoring the use of road-crossing structures by arboreal marsupials: Insights gained from motion-triggered cameras and passive integrated transponder (PIT) tags*. *Wildlife Research*. 42. 10.1071/WR14067
- Stevens, Puotinen & Whelan (2008). *Powerline easements: ecological impacts and contribution to habitat fragmentation from linear features*. *Pacific Conservation Biology* 14, 159-168.
- Summit Power (2025). *Power Line Safety Markers and Bird Diverters*. Retrieved from: <https://www.summitpower.com.au/powerline-markers>
- Taylor, A. C., Tyndale-Biscoe, H. and Lindenmayer, D.B. (2007), *Unexpected persistence on habitat islands: genetic signatures reveal dispersal of a eucalypt-dependent marsupial through a hostile pine matrix*, *Molecular Ecology*, 16, pp. 2655–2666.
- Threatened Species Scientific Committee (2016). *Conservation Advice: Delma impar, striped legless*

lizard

- Threatened Species Scientific Committee (2019). *Conservation Advice: Litoria castanea (Yellow-spotted Bell Frog)*
- Threatened Species Scientific Committee (2020). *Conservation Advice: Dasyurus maculatus maculatus (southeastern mainland population)*
- Threatened Species Scientific Committee (2021). *Conservation Advice: Litoria booroolongensis, Booroolong Frog*
- Transgrid (2023). *HumeLink Vegetation Clearing Method and Management Memorandum*, Rev 1
- NSW Threatened Species Scientific Committee [TSSC] (2020). *Notice of and reasons for the final Determination Keyacris scurra*.
- Trangrid (2023). *HumeLink Vegetation Clearing Method and Management Memorandum Rev 1 – November 2023*
- van der Ree, R., Bennett, A., & Soderquist, T. (2006). *Nest-tree selection by the threatened brush-tailed phascogale (Phascogale tapoatafa) (Marsupialia: Dasyuridae) in a highly fragmented agricultural landscape*. Wildlife Research. 33. 113-119. 10.1071/WR05007.
- Wildlife Preservation Society of Queensland (2025). *Threatened Species Recovery Plans – not for the faint-hearted*. Retrieved from: <https://wildlife.org.au/threatened-species-recovery-plans-not-for-the-faint-hearted/>
- Williams, E., Thomson, B. (2019) *Aspects of the foraging and roosting ecology of the large-eared pied bat (Chalinolobus dwyeri) in the western Blue Mountains, with implications for conservation*. Australian Mammalogy 41, 212-219.
- Wong, D., Jones, S., Osborne, W., Brown, G., Robertson, P., Michael, D., & Kay, G. (2011). *The life history and ecology of the Pink-tailed Worm-lizard Aprasia parapulchella Kluge—a review*. Australian Zoologist, 35(4), 927-940.
- Woods, R. E., & Ford, F. D. (2000). *Observations on the behaviour of the smoky mouse Pseudomys fumeus (Rodentia: Muridae)*. Australian Mammalogy, 22(1), 35-42.
- Yagui, H. (2024). *Key's Matchstick Grasshopper (Keyacris scurra) Expert Report – HumeLink project*

Annexure G

Rehabilitation Plan

HumeLink West

Document Number: HLW-HLJV-PRW-ENM-PLN-000001G

Revision: 3

TransGrid
Date 28/07/2025

Document Control

Approvals

Title	HumeLink West Rehabilitation Plan
Endorsed by Environment Representative	Derek Low (Wolfpeak Group Ltd Pty)
Approved on behalf of HLWJV by	Tim Burns
Signed	
Dated	

Version Control

Revision	Date	Description	Approval
A	3/07/2024	Preliminary draft	Paul Dudding
B	19/08/2024	Update following TG review	Paul Dudding
1	20/12/2024	Updates following receipt of final MCoAs and draft CoMA	Tim Burns
2	4/06/2025	Updates following ER, FCNSW & CPHR review	Tim Burns
3	28/07/2025	Updates following ER & CPHR review	Tim Burns

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Attachments

Attachment 1	Indicative seed collection schedule
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Abbreviations

Abbreviation	Expanded text
BAM	Biodiversity Assessment Method
BC Act	<i>Biodiversity Conservation Act 2016</i> (NSW)
BCS	Biodiversity Conservation and Science group within DCCEEWS – NSW (now referred to as CPHR)
BCT	Biodiversity Conservation Trust
BDAR	Biodiversity Development Assessment Report
BMP	Biodiversity Management Sub-plan
CEMP	Construction Environmental Management Plan
CoMA	Commonwealth Conditions of Ministerial Approval
Cth	Commonwealth
CPHR	Conservation Programs, Heritage & Regulation Division (formerly BCS)
CWD	Coarse Woody Debris
DAWE	Commonwealth Department of Agriculture, Water and Environment (now known as DCCEEWS - Cth)
DCCEEWS – Cth	Commonwealth Department of Climate Change, Environment, Energy and Water
DCCEEWS – NSW ¹	The NSW Department of Climate Change, Energy, the Environment and Water (formerly DPE)
DPE	Department of Planning and Environment (now known as DPHI)
DPI	Department of Primary Industries
DPiE	Department of Planning, Industry and Environment (now known as NSW DCCEEWS)
DPHI	Department of Planning, Housing and Infrastructure
EIS	Environmental Impact Statement
EPBC Act	<i>Environmental Protection and Biodiversity Conservation Act 1999</i> (Cth)
GIS	Geographic Information System
GPS	Global Positioning System
HLW	The HumeLink West Stage of the HumeLink project
HLWJV	HumeLink West Joint Venture (UGL Limited and CPB Contractors)
KFH	Key Fish Habitat
KMG	Key's Matchstick Grasshopper

¹ As of the 1st January 2024 the NSW Department of Planning and Environment has split into the Department of Climate Change, Energy, the Environment and Water (NSW) and the Department of Planning, Housing and Infrastructure. DCCEEWS (NSW) includes the environmental regulators (such as NSW EPA, BCS, NPWS, DPE-Water), while the Department of Planning, Housing and Infrastructure (DPHI) includes planning regulatory services.

Abbreviation	Expanded text
LWD	Large Woody Debris
MCoA	NSW Minister's Conditions of Approval
NSW	New South Wales
OEH	Office of Environment and Heritage
PCT	Plant Community Type
Revised BDAR	<i>HumeLink Biodiversity Development Assessment Report Rev 0</i> (Niche Environment and Heritage Pty Ltd, June 2024)
SAII	Serious and Irreversible Impact
TARP	Trigger Action Response Plan
TCZ	Total Clearing Zone
TEC	Threatened Ecological Community
TSSC	Threatened Species Scientific Commission
UMM	Updated Environmental Management Measure as outlined in the Planning Approvals Documentation
WoNS	Weeds of National Significance

1. Introduction

1.1. Context

This Rehabilitation Plan forms part of the Biodiversity Management Sub-plan (BMP) of the HumeLink West project (HLW) Construction Environmental Management Plan (CEMP). This plan has been prepared to outline and describe how the UGL Limited and CPB Contractors Joint Venture (HLWJV), during the construction of HLW, will comply with the Minister's Conditions of Approval (MCoA), the Federal Minister for Water and Environment Condition of Ministerial Approval (CoMA), the Updated Management Measures (UMM), and undertake its duties in accordance with the Planning Approval Documentation listed under the MCoA A2.

1.2. Purpose

The HLW project involves sites of temporary disturbance required for the construction of transmission line structures as well as construction compounds and temporary workforce accommodation facilities. Disturbance includes any temporary impacts to vegetation required during enabling works required to establish such features. Measures detailed within this plan aim to rehabilitate temporary disturbance areas to facilitate natural regeneration of suitable native species. Furthermore, this plan aims to maximise the salvage and reuse of resources within the approved disturbance area for beneficial reuse (such as fauna habitat enhancement) during the rehabilitation and revegetation of the site.

As such, this plan has been prepared based on current best practices to guide the salvage and reuse of resources, and the rehabilitation of temporarily disturbed areas during the construction of HLW. The plan aims to address relevant actions and mitigation measures outlined in the following documents:

- Updated mitigation measures B3, B9, B18 and B19 of the *Biodiversity Development Assessment Report Rev 0* (Revised BDAR; Niche Environment and Heritage Pty Ltd, June 2024).
- Conditions B25, B30, B62 and B63 of the Minister's Conditions of Approval (MCoA) A2.
- Condition 2 and 7 of the Federal Minister for Water and Environment Condition of Ministerial Approval (CoMA).
- *Key's Matchstick Grasshopper (Keyacris scurra) Expert Report – HumeLink project* (Yagui, 2024).

1.3. Objective

The objective of this plan is to facilitate rehabilitation of temporarily disturbed areas to such a point that the disturbed ecosystem will have high resilience and the ability to rely on natural process to recover from any later disturbances. This includes rehabilitation of *Keyacris scurra* (Key's Matchstick Grasshopper) habitat. To achieve this, this plan:

- Identifies temporary disturbance areas associated with the enabling and construction works of HLW, including areas of Key's Matchstick Grasshopper habitat.
- Outlines pre-disturbance biodiversity conditions.
- Details rehabilitation measures including :
 - Site preparation.
 - Seed collection.
 - Salvage, storage and reuse of resources.
- Details compliance management measures and procedures through monitoring.
- Prescribes threshold triggers for the implementation of adaptive management measures.

2. Environmental requirements

2.1. Relevant documents and guidelines

The main documents and guidelines relevant to this plan include:

- Revised BDAR (Niche Environment and Heritage Pty Ltd, June 2024).
- *Rehabilitation Guidelines for the Resort Areas of Kosciuszko National Park* (DEC, 2007).
- *Conservation Advice for Keyacris scurra (Key's Matchstick Grasshopper)* (TSSC, 2022).
- *A Revegetation Guide for Temperate Grasslands* (Greening Australia, 2017).
- *Key's Matchstick Grasshopper (Keyacris scurra) Expert Report* – HumeLink project (Yagui, 2024).

Refer to Section 6 for a full list of references.

2.2. Preparation of this plan

In accordance with MCoA B30a, this plan has been prepared by suitably qualified and experienced biodiversity experts of RPS AAP Consulting Pty Ltd:

- Polina Zadorojnaya (BSc; BAM Accredited Assessor BAAS 23014).
- Chelsea Tiller (BSc).
- Heather Duff (BScHons Geology; BSc).

2.3. Consultation

Consultation undertaken in preparation of this plan is summarised in Section 4 and Annexure J: Consultation Report of the HLW BMP. If consultation with relevant stakeholders or regulators is required to assess the efficacy of mitigation strategies detailed in this plan, these will be undertaken in accordance with Section 8.3 of the HLW BMP.

2.4. Minister's Conditions of Approval

The MCoA relevant to this plan are listed in Table 2-1. A cross reference is also included to indicate where and how the conditions are addressed in this plan or other HLW management documents.

Table 2-1 MCoA relevant to this plan

MCoA No.	Condition Requirements	Document Reference
Restrictions 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	Not addressed in this plan – refer to the HLW BMP, including Annexure B: Clearing Protocol.
	(b) minimise: (i) The impacts of the development on hollow-bearing trees. (ii) The impacts of the development on threatened flora and fauna populations. (iii) The clearing of native vegetation and key habitat.	This plan includes provisions for minimising impacts on threatened fauna populations via the salvage (Section 4.1.2) and reuse of habitat features (Section 4.3.2).
	(c) not undertake any works that result in ground disturbance within a minimum setback distance of 50 metres from PCT 637 – Alpine and sub-alpine peatlands, damp herbfields and fens, South Eastern Highlands Bioregion and Australian Alps Bioregion and 30 metres from known locations of <i>Prasophyllum bagoense</i> , <i>Prasophyllum keltonii</i> and <i>Pterostylis oreophila</i> as mapped in the BDAR.	Not addressed in this plan – refer to the HLW BMP, including Annexure B: Clearing Protocol.
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 plan forms part of the HLW BMP.
	(a) be prepared by a suitably qualified and experienced biodiversity expert/s;	Section 2.2.

MCoA No.	Condition Requirements	Document Reference
	(b) be prepared in consultation with CPHR and FCNSW;	Section 2.3.
	(c) be prepared generally in accordance with the Revised Biodiversity Development Assessment Report (Revision 0, dated 21 June 2024);	Section 1.2, 2.1 and Table 2-3.
	(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;	Not addressed in this plan – refer to HLW BMP.
	(ii) minimising: - the amount of vegetation clearing on site; - the loss of key fauna habitat (including tree hollows); - the impacts of fauna on site, including undertaking pre-clearance surveys; and - potential indirect impacts on threatened flora and fauna species;	This plan includes provisions for minimising the loss of key fauna habitat via habitat salvage (Section 4.1.2), storage (Section 4.1.4) and re-use (Section 4.3.2). It also includes provisions for minimising impacts to the Key's Matchstick Grasshopper through rehabilitation of temporarily disturbed habitats (Section 4.3.3.1).
	(iii) ensuring the development does not adversely affect the native vegetation and habitat outside the disturbance footprint;	Not addressed in this plan – refer Annexure B: Clearing Protocol of the HLW BMP.
	(iv) protocols for unexpected finds of threatened species and threatened ecological communities within the disturbance footprint including the requirements for:	Not addressed in this plan – refer to Annexure D: Unexpected Finds

MCoA No.	Condition Requirements	Document Reference
	- all work in the associated location to stop to prevent further impact, and - notification to the Planning Secretary and CPHR (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;	Procedure of the HLW BMP.
	(v) connectivity strategy for the potentially impacted species identified in the Revised Biodiversity Development Assessment Report (Revision 0, dated 21 June 2024) and a Supplementary Hollow and Nest Strategy;	Not addressed in this plan – refer to Annexure C: Hollow and Nest Strategy & Annexure F: Connectivity Strategy of the HLW BMP.
	(vi) protecting the conservation values of McPhersons Plain and avoiding impacts to Prasophyllum bagoensis, Prasophyllum keltonni and Pterostylis oreophila;	Not addressed in this plan – refer Annexure B: Clearing Protocol of the HLW BMP.
	(vii) rehabilitating temporary disturbance areas to facilitate natural regeneration of suitable native species;	This plan has been prepared to address MCoA B30(vii), and forms part of the HLW BMP.
	(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;	Not addressed in this strategy – refer Annexure H: Biodiversity Monitoring Program of the HLW BMP.
	(ix) maximising the salvage of resources within the approved disturbance area – including vegetative and soil resources – for beneficial reuse (such as fauna	Salvage of vegetative resources (Section 4.1.2 and 4.1.3) and soil

MCoA No.	Condition Requirements	Document Reference
	habitat enhancement) during the rehabilitation and revegetation of the site;	resources (Section 4.1.1). Reuse of vegetative resources (Section 4.3.2 and 4.3.3) and soil resources (Section 4.3.1).
	(x) collecting and propagating seed (where relevant);	Section 4.1.3 and 4.3.3.
	(xi) controlling erosion, weeds and feral pests;	This plan includes provisions for controlling erosion through soil preparation (Section 4.2.2) and the salvage (Section 4.1.1), storage (Section 4.1.4) and re-use (Section 4.3.1) of soil resources within temporary disturbance areas. It also includes provisions for weed management (Section 4.2.4) and fauna exclusion (Section 4.2.3) in such areas. Refer Annexure H: Biodiversity Monitoring Program of the HLW BMP for additional measures to address this condition.

MCoA No.	Condition Requirements	Document Reference		
	(xii)bushfire management;	Not addressed in this strategy – refer to Section 7.6 of the HLW BMP.		
	(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	This plan includes provisions for the rehabilitation of temporarily disturbed areas of Box Gum Woodland (Section 3.1.1.1, and Section 4).		
	(e) include a program to monitor, evaluate and publicly report on the effectiveness of these measures.	Section 5		
	Following the Planning Secretary’s approval, the Proponent must implement the Biodiversity Management Plan. <i>Note: The Biodiversity Management Plan must incorporate all relevant aspects of the development, including Enabling Works consistent with the requirements of condition B67.</i>	Section 2.2.		
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 <table><tr><th>Feature</th><th>Objective</th></tr></table>	Feature	Objective	This plan has been prepared to address MCoA B62.
Feature	Objective			

MCoA No.	Condition Requirements	Document Reference								
	<table><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>	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							
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	This plan has been prepared to address MCoA B63.
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									

2.5. Federal Minister for Water and Environment Condition of Ministerial Approval

The CoMA relevant to this plan are listed in Table 2-2. A cross reference is also included to indicate where and how the conditions are addressed in this plan or other HLW management documents.

Table 2-2 CoMA relevant to this plan

CoMA No.	Condition Requirements	Document Reference
Clearing Limits		
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.	Refer Table 2-1.

CoMA No.	Condition Requirements	Document Reference
Biodiversity Management Plan		
7	The approval holder must comply with condition B30 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.	Refer Table 2-1.

2.6. Updated Management Measures

UMMs relevant to this plan are listed in Table 2-3 below. A cross reference is also included to indicate where and how the conditions are addressed in this plan or other HLW management documents.

Table 2-3 UMMs relevant to this plan

UMM No.	Condition Requirements	HLW Stage	Applicable location(s)	Document Reference
Biodiversity				
B3	A Biodiversity Management Plan (BMP) will be prepared in consultation with NSW DCCEE 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 <i>Technical Report 1 – Revised Biodiversity Development Assessment Report</i> , including:	Detailed design and construction	All locations	This plan forms part of the HLW BMP.
	Measures to minimise impacts to biodiversity, 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.			This plan includes provisions for minimising impacts on threatened fauna populations via the salvage (Section 4.1.2) and reuse of habitat features

UMM No.	Condition Requirements	HLW Stage	Applicable location(s)	Document Reference
				(Section 4.3.2).
	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.			Not addressed in this plan – refer Annexure B: Clearing Protocol of the HLW BMP.
	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 bushrock) identified in <i>Technical Report 1 – Revised Biodiversity Development Assessment Report</i> 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.			This plan includes provisions for the retention of habitat features (4.1.2). Refer the HLW BMP, including Annexure B: Clearing Protocol & Annexure F: Connectivity Strategy for additional measures to address this condition.

UMM No.	Condition Requirements	HLW Stage	Applicable location(s)	Document Reference
	Proposed rehabilitation of temporary disturbance areas including management and maintenance measures.			This plan has been prepared to address this condition.
	Unexpected species finds protocol to be implemented if threatened ecological communities, flora and fauna species, not assessed in <i>Technical Report 1 – Revised Biodiversity Development Assessment Report</i>, are encountered during pre-clearing inspections.			Not addressed in this plan – refer Annexure D: Unexpected Finds Procedure of the HLW BMP.
	A description of biosecurity protocols for plant and equipment movement between sites, including species specific measures.			Not addressed in this plan – refer Annexure E: Biosecurity Management Plan of the HLW BMP.
	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.			Not addressed in this plan – refer Section 7.4 of the HLW BMP.
	Outline monitoring and compliance management requirements.			Section 5.
	Approach to relocation of nests by suitably qualified ecologist where found within construction work sites (ie 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.			Not addressed in this plan – refer Annexure C: Hollow and Nest Strategy of the HLW BMP.
	Details on the pre-clearing and clearing supervision process.			Section 4.1.2. Refer Annexure B: Clearing Protocol of the HLW

UMM No.	Condition Requirements	HLW Stage	Applicable location(s)	Document Reference
				BMP for additional measures to address this condition.
	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.			Section 4.3.2.1. Refer Section 7.7 of the HLW BMP for additional measures to address this condition.
	Procedures for reporting the outcomes of pre-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 (eg timing construction outside of breeding seasons, crossing type, micro siting).			Not addressed in this plan – refer Section 7.7 of the HLW BMP.
	Procedures for the stockpiling and supply of felled trees for KFH rehabilitation or improvement works, including procedures for consultation with DPI Fisheries.			Section 4.3.2.1.
	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			Not addressed in this plan – refer Annexure H: Biodiversity Monitoring Program of the HLW BMP.

UMM No.	Condition Requirements	HLW Stage	Applicable location(s)	Document Reference
	- 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 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.			
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	Within mapped habitats	Golden Sun Moth is not relevant to the HLW stage of the HumeLink Project. Refer to Section 7.2 of the HLW BMP for avoiding and minimising impacts to Key's Matchstick Grasshopper habitats. This strategy addresses the rehabilitation of temporarily disturbed Key's Matchstick

UMM No.	Condition Requirements	HLW Stage	Applicable location(s)	Document Reference
				Grasshopper habitats (Section 4.3.3.1).
B18	All disturbed lands/areas must be managed throughout the construction work (in accordance with the relevant <i>Managing Urban Stormwater</i> (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 <i>Managing Urban Stormwater</i> (Blue Book) or comparable best practice guidelines.	Construction	All locations	This plan includes provisions for all components of this condition within temporarily disturbed areas.

UMM No.	Condition Requirements	HLW Stage	Applicable location(s)	Document Reference
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 (ie 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 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.	Construction	Transmission line corridor	Section 4.1.2 and 4.3.2.
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.	Construction and operation	Transmission line corridor - access track waterway crossing	Section 4.2 & 4.3.2.1.

3. Background

3.1. Temporarily disturbed areas

Annexure B: Clearing Protocol of the HLW BMP provides specified disturbance zones and their clearing methodologies, informed by the *HumeLink Vegetation Clearing Method and Management Memorandum* (Rev 1; Transgrid, 2023). Temporarily disturbed areas are associated with the Total Clearing Zone (TCZ) as follows:

1. Brake and winch sites used during construction stringing activities – typically 60 m by 80 m.
2. Construction compounds and temporary workforce accommodation facilities.
3. Access tracks that are not required for operational maintenance and that are approved for removal by the appropriate landowner.

These areas are displayed in Figure 3-1 below (note: temporarily disturbed access tracks are excluded due to ongoing consultation with relevant landowners, however would be subject to measures detailed in this plan if deemed temporary).

3.1.1. Vegetation

Rehabilitation of temporary disturbance areas is required to restore land capability to pre-existing productive capacity, facilitating natural regeneration post-construction. Vegetation within temporary disturbance areas within the TCZ (i.e., brake and winch sites, construction compounds and temporary workforce accommodation facilities) is summarised below and detailed in Table 3-1:

- 34.66 ha of native vegetation.
- 95.43 ha of non-native vegetation. Largely consistent with Category 1 (exempt land) per the *Local Land Services Act 2013*.

3.1.1.1. Threatened Ecological Communities

Three Threatened Ecological Communities (TECs) will be impacted by temporary disturbances, thereby rehabilitated as part of this plan (Table 3-1):

- Critically Endangered & entity at risk of Serious and Irreversible Impact (SAIL): White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland per BC Act & EPBC Act.
- Endangered & SAIL: Tableland Basalt Forest in the Sydney Basin and South Eastern Highlands Bioregions per BC Act.
- Endangered: Montane Peatlands and Swamps per BC Act & EPBC Act.

Table 3-1 Pre-clearing vegetation within temporary disturbance areas

Vegetation	TEC	Temporary disturbance area (ha)
PCT 266	Part BC Act: White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland (Critically Endangered Ecological Community [CEEC] & SAIL) Part EPBC Act: part White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland (CEEC)	0.33
PCT 268	Part BC Act: White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland (CEEC & SAIL) Part EPBC Act: part White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland (CEEC)	0.09

Vegetation	TEC	Temporary disturbance area (ha)
PCT 277	Part BC Act: White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland (CEEC & SAIL) Part EPBC Act: part White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland (CEEC)	13.79
PCT 285	N/A	0.37
PCT 287	N/A	0.77
PCT 290	N/A	7.17
PCT 297	N/A	0.68
PCT 299	N/A	0.16
PCT 300	N/A	0.16
PCT 306	N/A	2.04
PCT 319	N/A	1.09
PCT 343	N/A	0.50
PCT 352	BC Act: White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland (CEEC & SAIL)	1.33
PCT 638	N/A	0.34
PCT 679	N/A	0.62
PCT 939	BC Act: Montane Peatlands and Swamps (EEC) EPBC Act: Alpine Sphagnum Bogs and Associated Fens (EEC)	0.13
PCT 953	Part BC Act: Part Tableland Basalt Forest (EEC & SAIL)	4.52
PCT 1196	N/A	0.57
TOTAL PRE-DISTURBANCE NATIVE VEGETATION		34.66
Non-native vegetation	N/A	95.43

3.2. Key's Matchstick Grasshopper (*Keyacris scurra*)

Species specialist reports prepared as part of the Revised BDAR (Yagui, 2024) identified that rehabilitation efforts should be considered to minimise and mitigate impacts to the Key's Matchstick Grasshopper (KMG). This species is detailed below.

3.2.1. Description and distribution

The Key's Matchstick Grasshopper is listed as Endangered under the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) and *Biodiversity Conservation Act 2016* (BC Act). It is a small, slender, wingless grasshopper recognised for its slanted face, splayed hind femora and ensiform antennae (TSSC, 2019). The species does not have a high dispersibility.

The species is historically distributed from Victoria to Orange in NSW, associated with the sheep/wheat belt (TSSC, 2020). Its extant distribution has been reduced by ongoing threats, including severe fragmentation of habitat, historical and inferred ongoing declined in abundance, habitat availability and quality, and poorly understood management requirements (TSSC, 2019). While

disturbance is known to contribute to species decline, there is a notable presence of KMG in disturbed areas which undergo infrequent disturbance (i.e., cemeteries, railway easements, travelling stock routes) but still contain the relevant native grasses. Disturbance appears to be an important determinant of site occupancy, and it is noted that the species is absent from sites that are disturbed at the incorrect time of the year or erratically which interrupts the short non-overlapping lifecycle (TSSC, 2022).

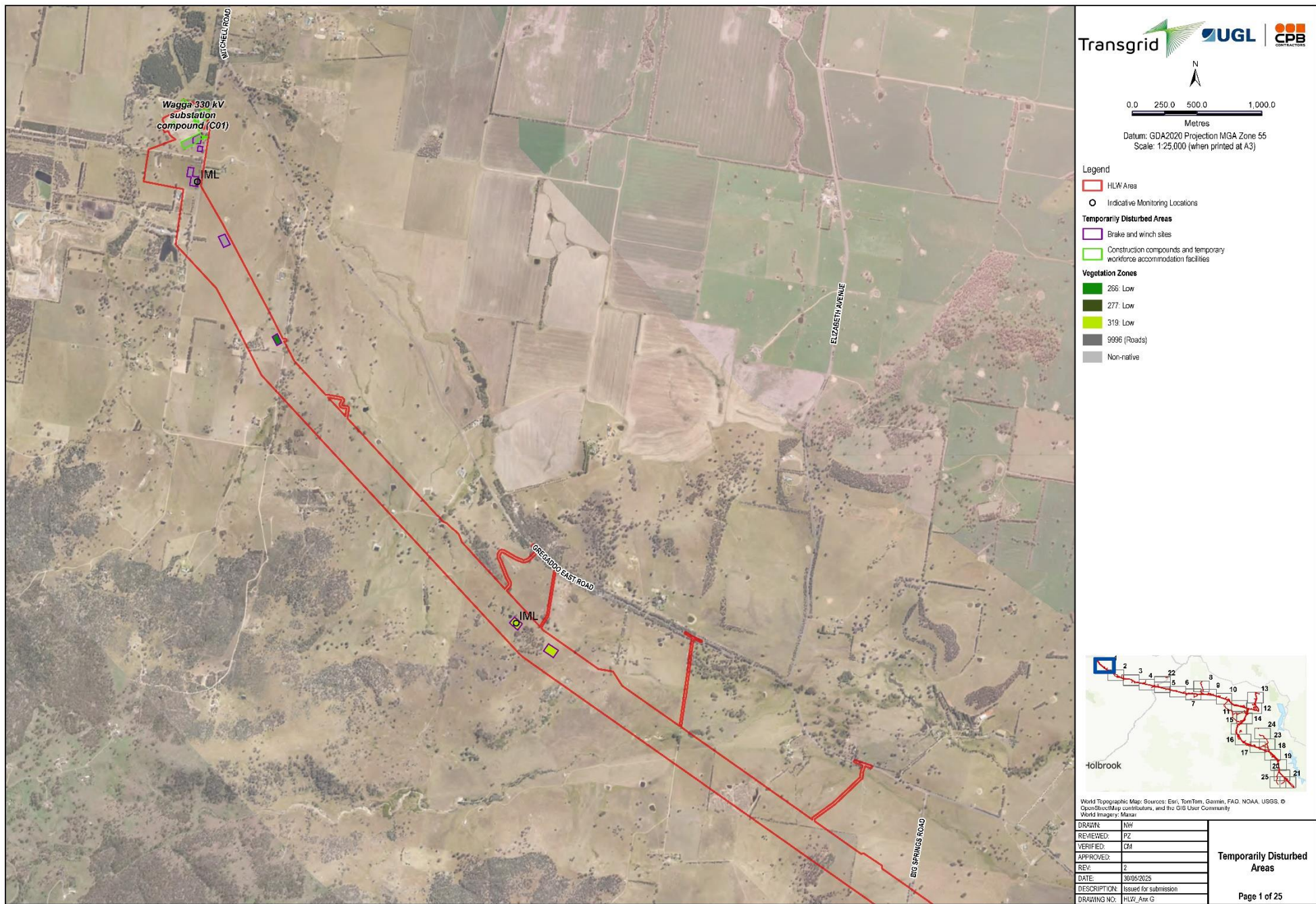
3.2.2. Habitat

Historical records of KMG are typically associated with primary and secondary native grasslands, dominated by tall stands of *Themeda triandra* (Kangaroo Grass) and species within the *Asteraceae* family (TSSC, 2020). The species has also been recorded in other vegetation types containing a native grass understory. In some reported locations there is an absence of *T. triandra* and very few or no *Asteraceae* species (TSSC, 2020).

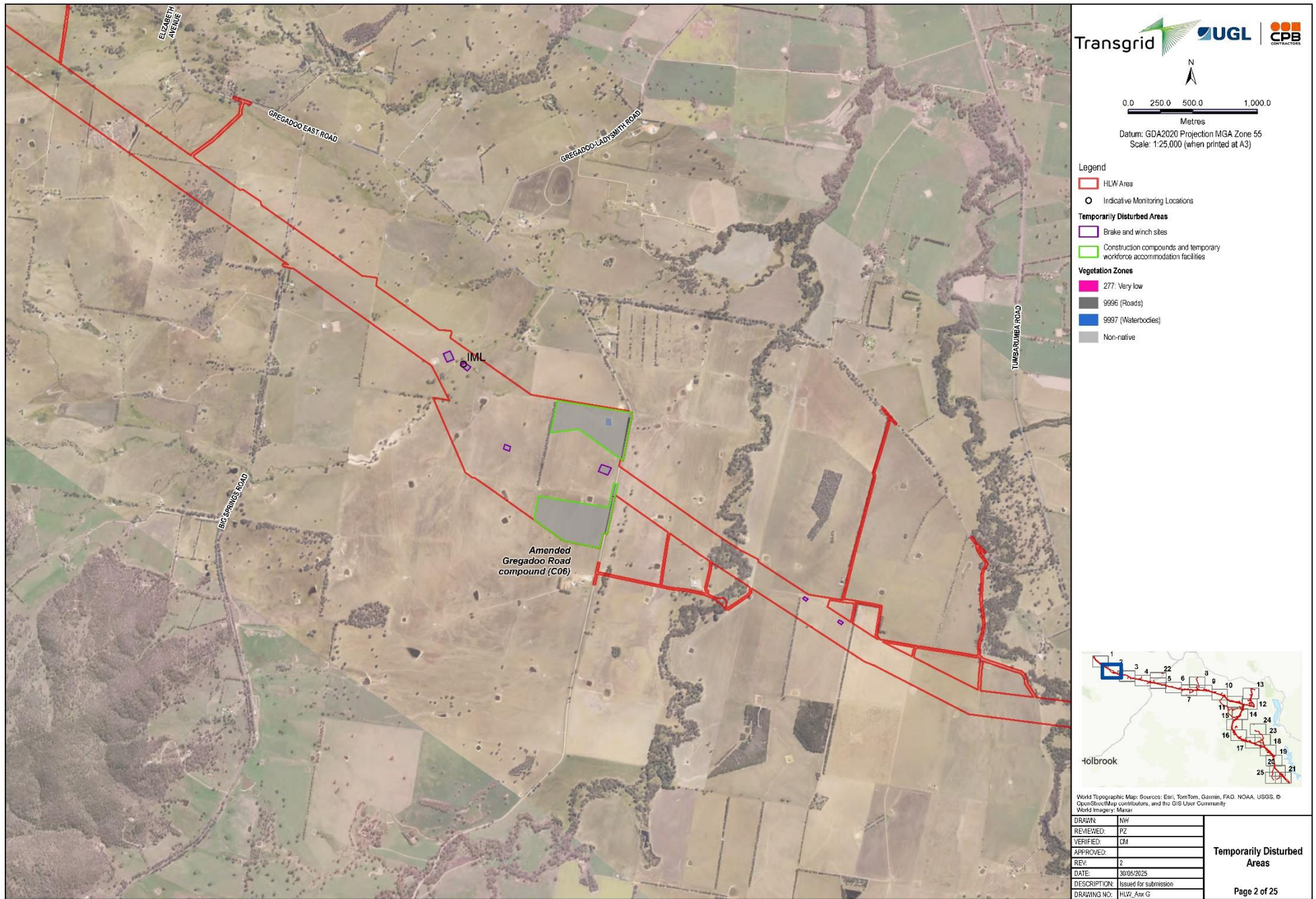
The species feeds on a range of native and introduced species, preferring small ephemeral plants to the larger perennial species, such as *Asteraceae* species, *Helichrysum apiculatum* (Common Everlasting), *Podolepis jaceoides* (Showy Copper-wire Daisy) and *Craspedia uniflora* (TSSC, 2020). The relationship to *T. triandra* is considered only for shelter from predators or climactic stressors and it is not part of the species' food requirements.

3.2.2.1. Temporarily disturbed areas

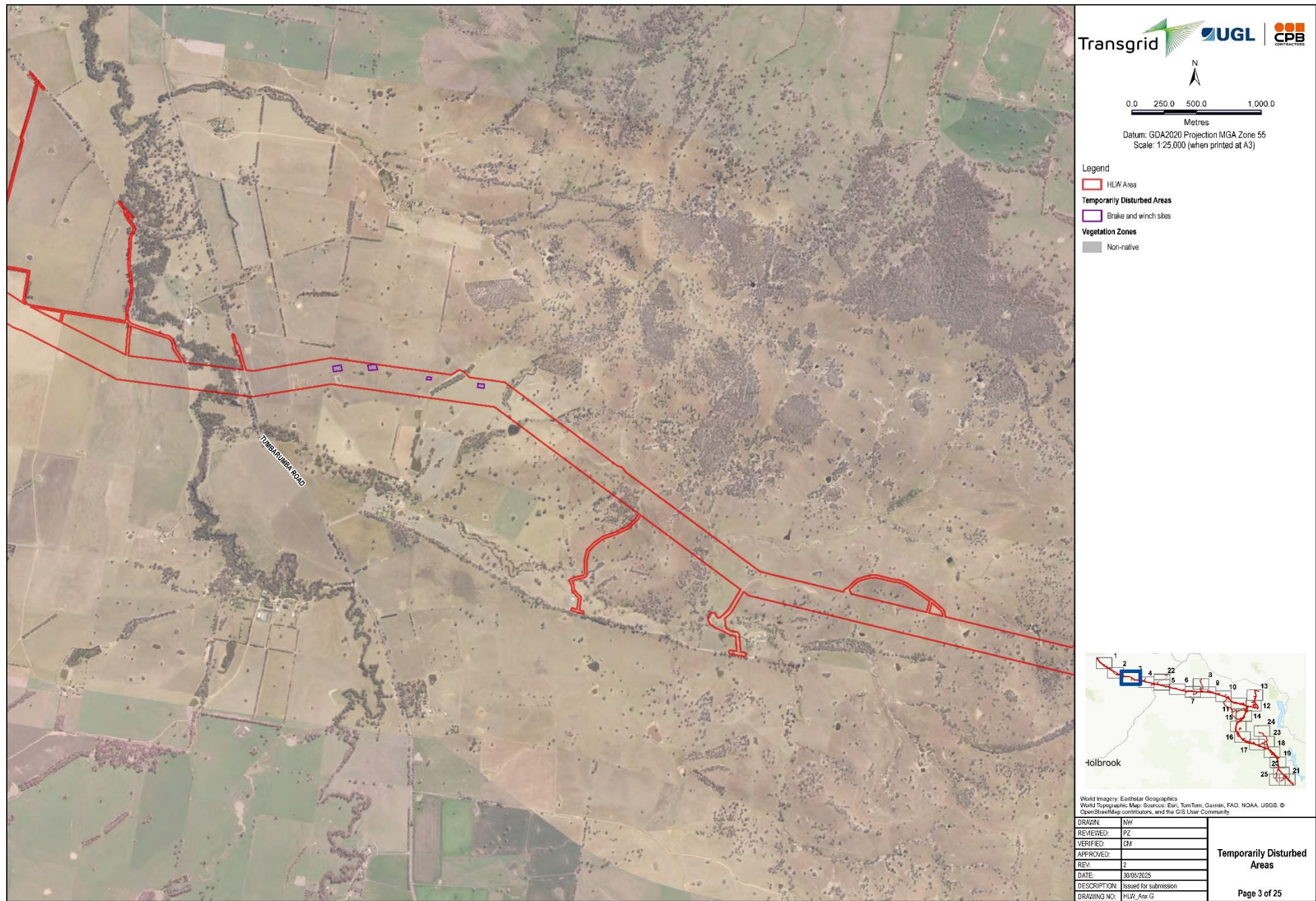
Per UMM B9, a rehabilitation plan would be developed for threatened insect habitat temporarily disturbed during construction. Key's Matchstick Grasshopper has been assumed present via the *Key's Matchstick Grasshopper (Keyacris scurra) Expert Report – HumeLink project* (Yagui, 2024). Only one patch of this species' polygon intersects with the Easement Clearing Zone, which may experience collateral temporary impacts to suitable habitat for this species (displayed in Figure 3-1 below).

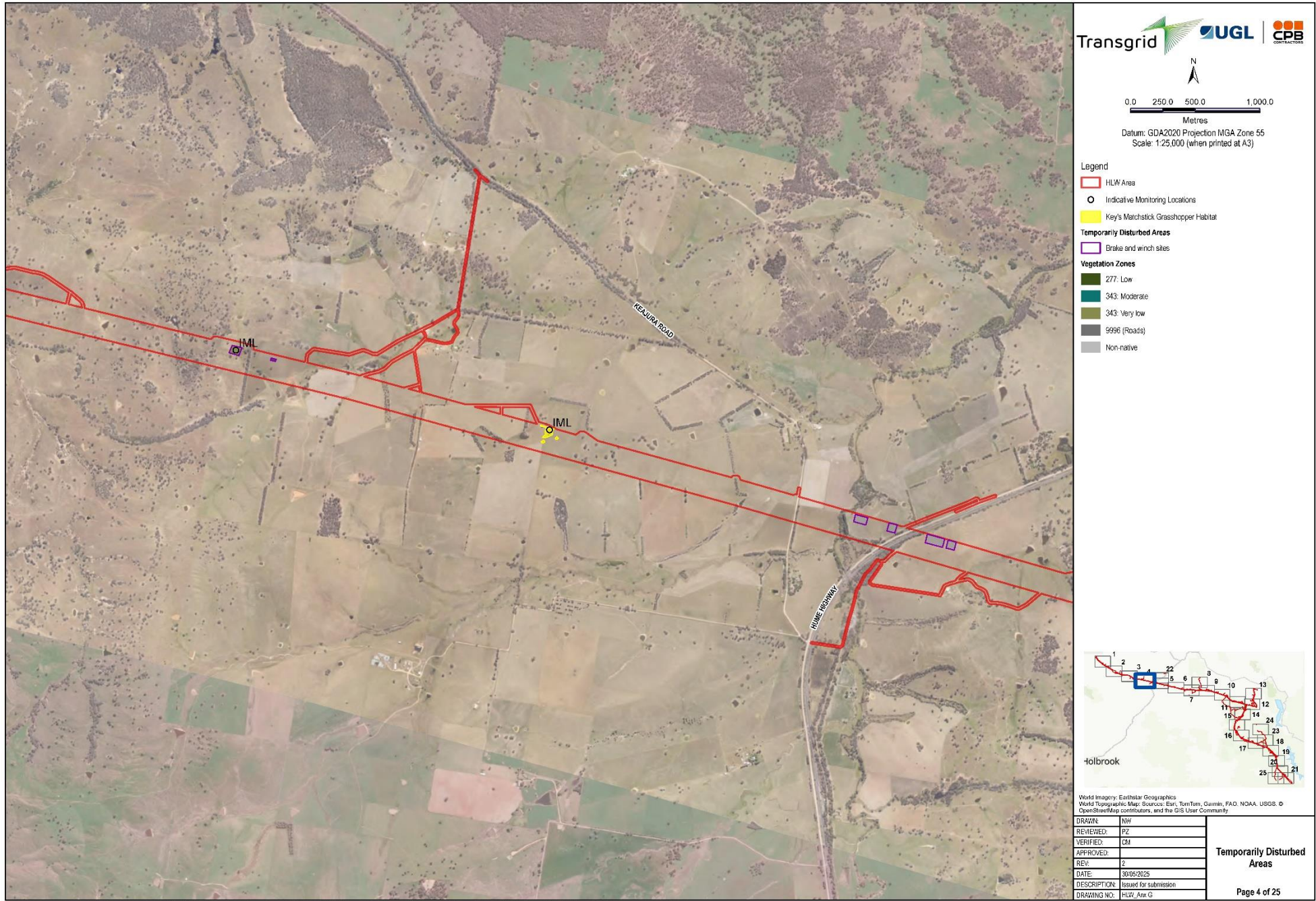


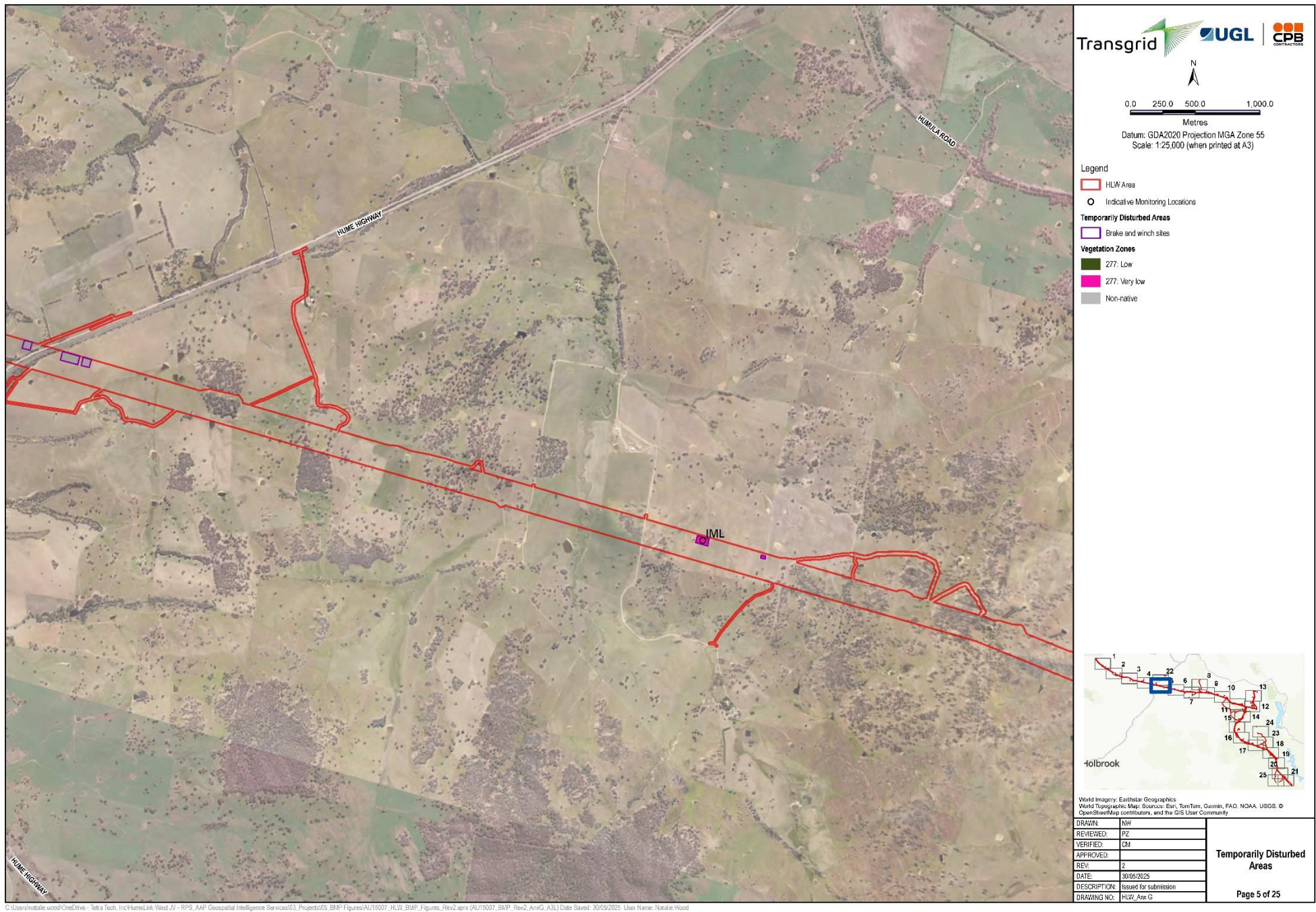
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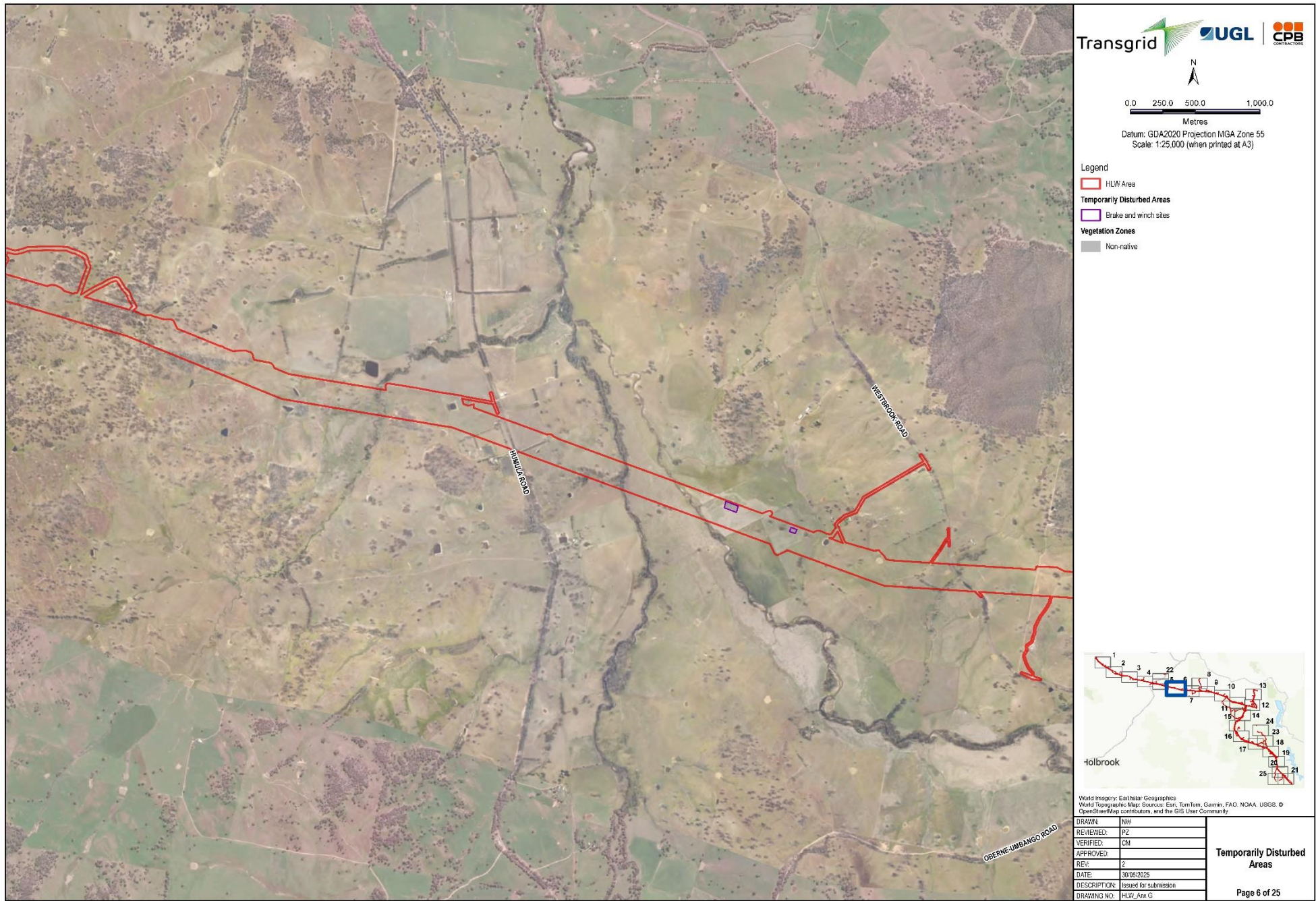


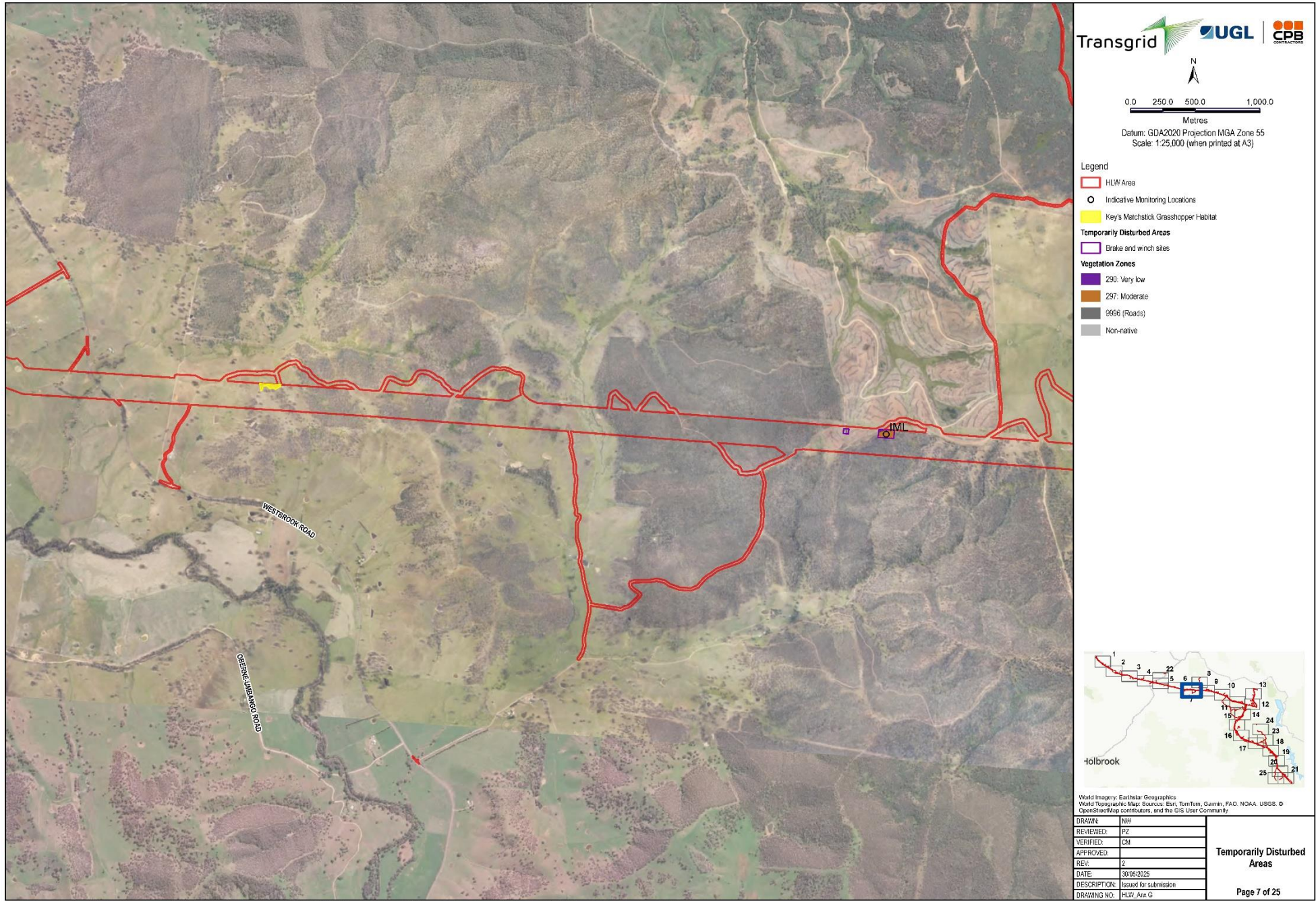
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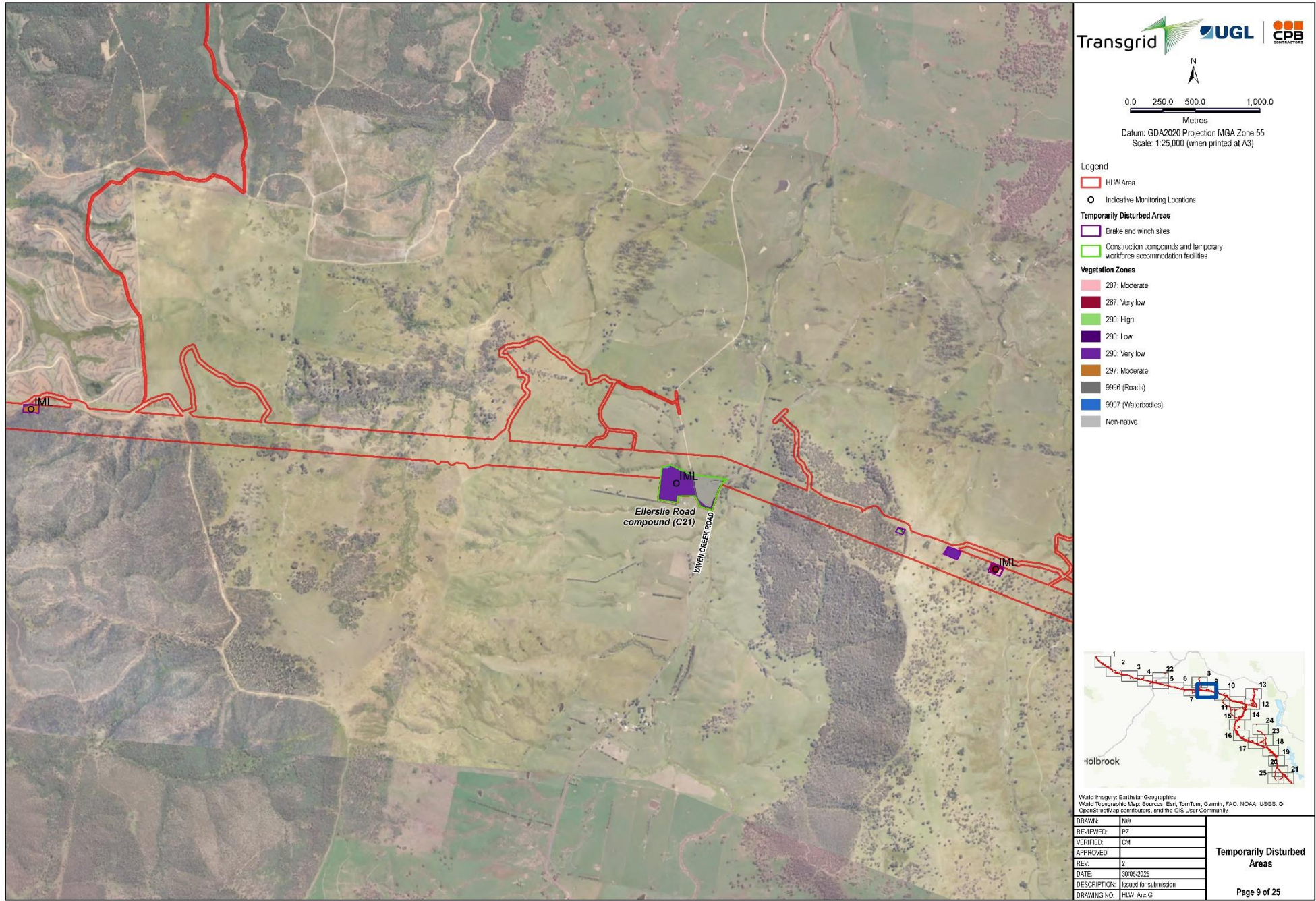


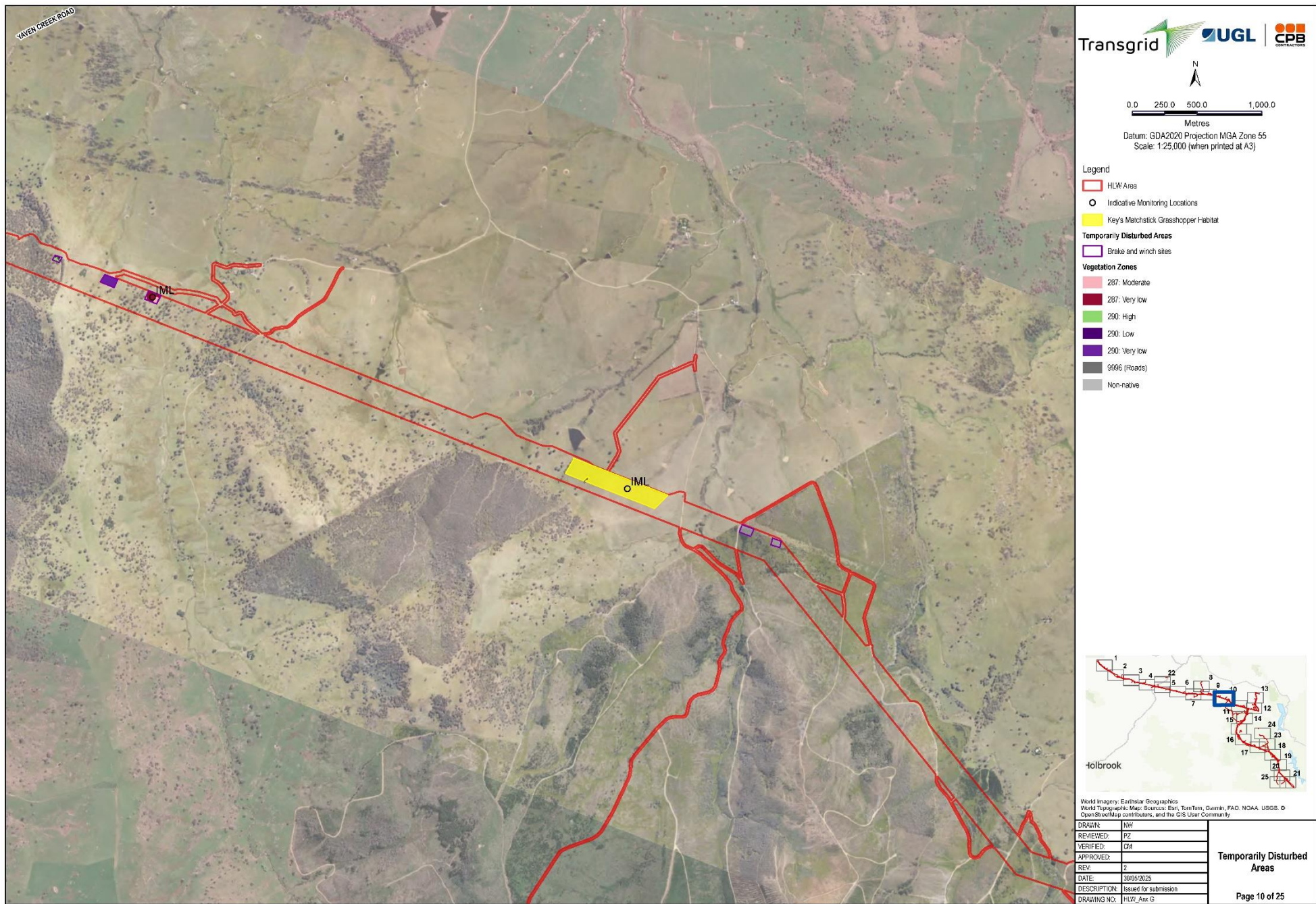


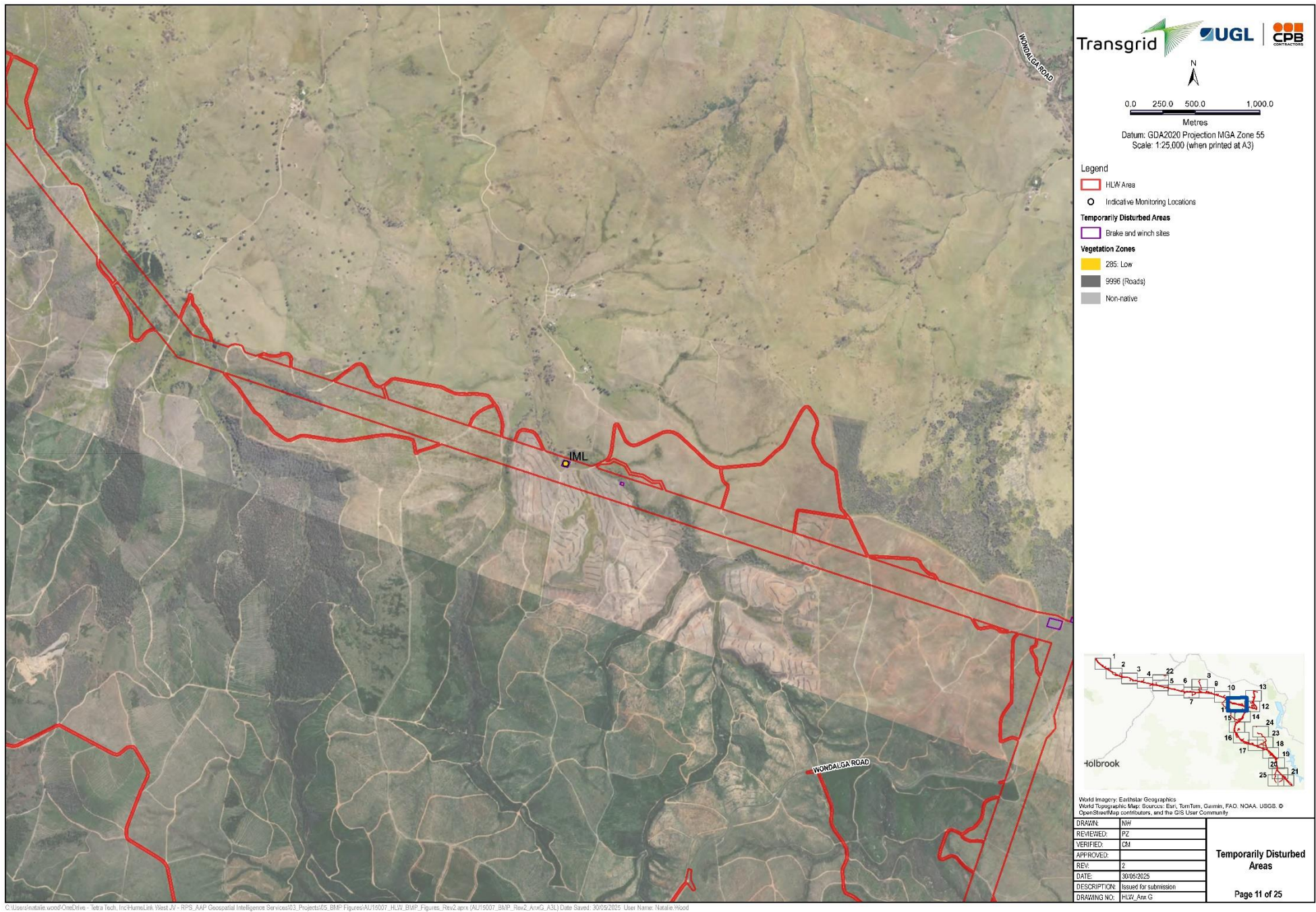




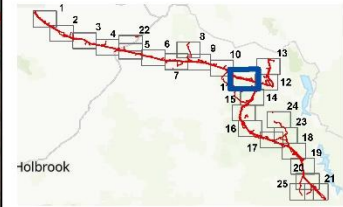








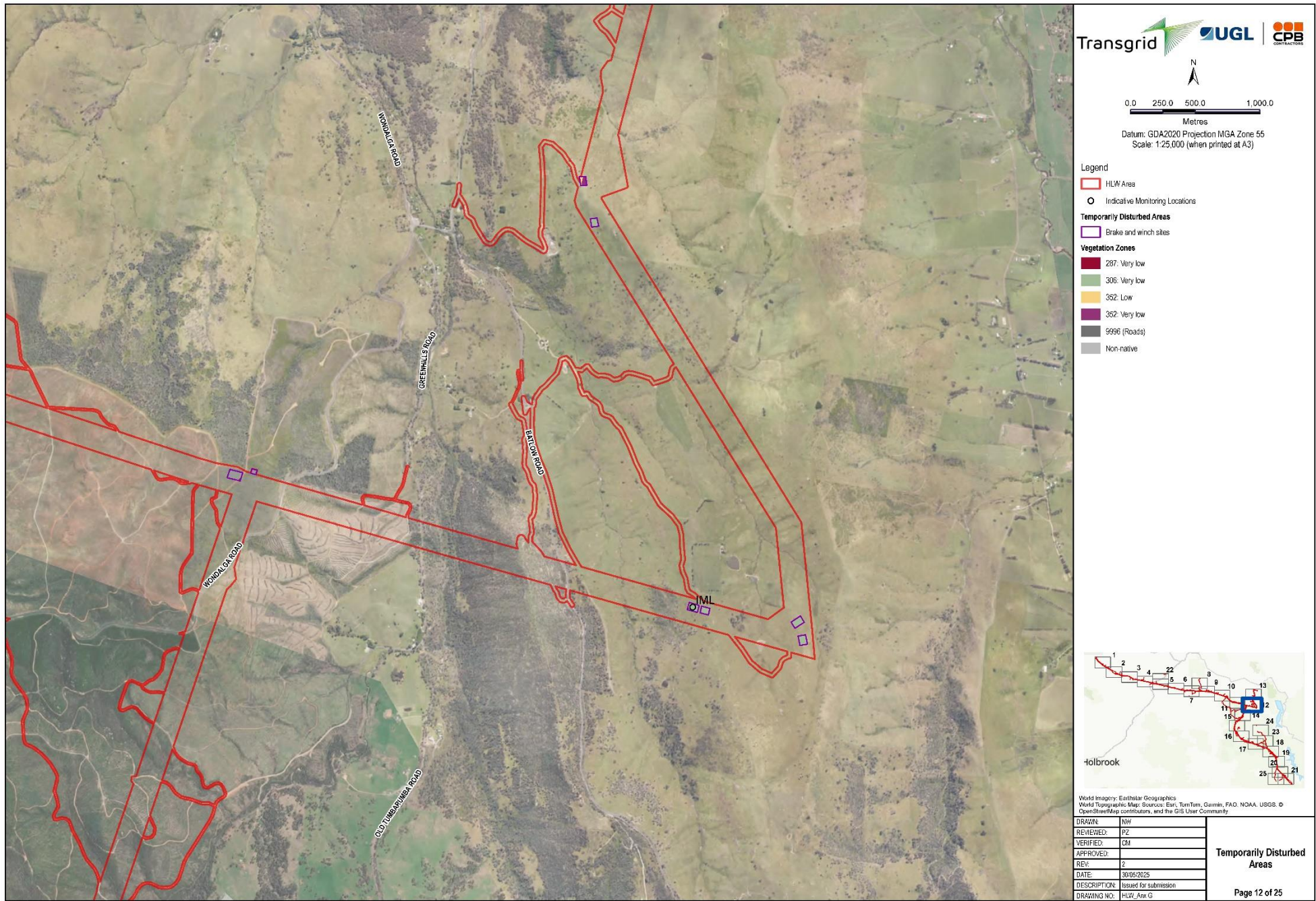
- Legend
- HLW Area
 - Indicative Monitoring Locations
 - Temporarily Disturbed Areas
 - Brake and winch sites
 - Vegetation Zones
 - 285: Low
 - 9996 (Roads)
 - Non-native

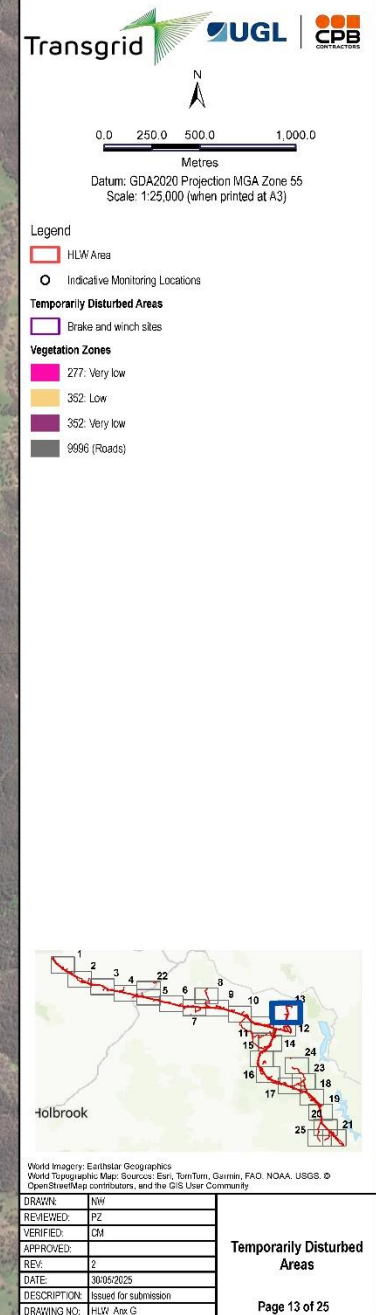


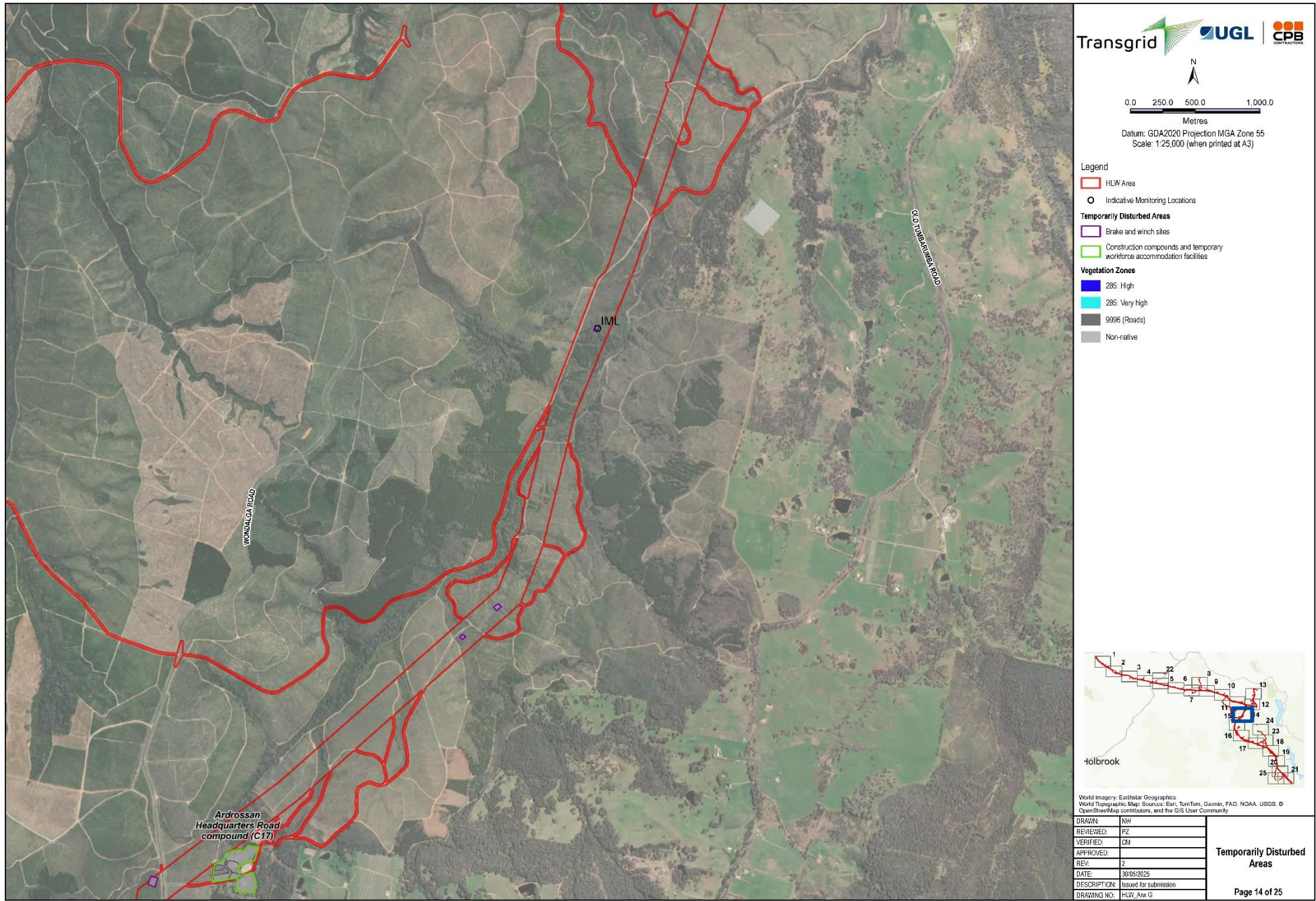
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World Topographic Map Sources: Esri, TerraMetrics, Garmin, FAO, NOAA, USGS, ©
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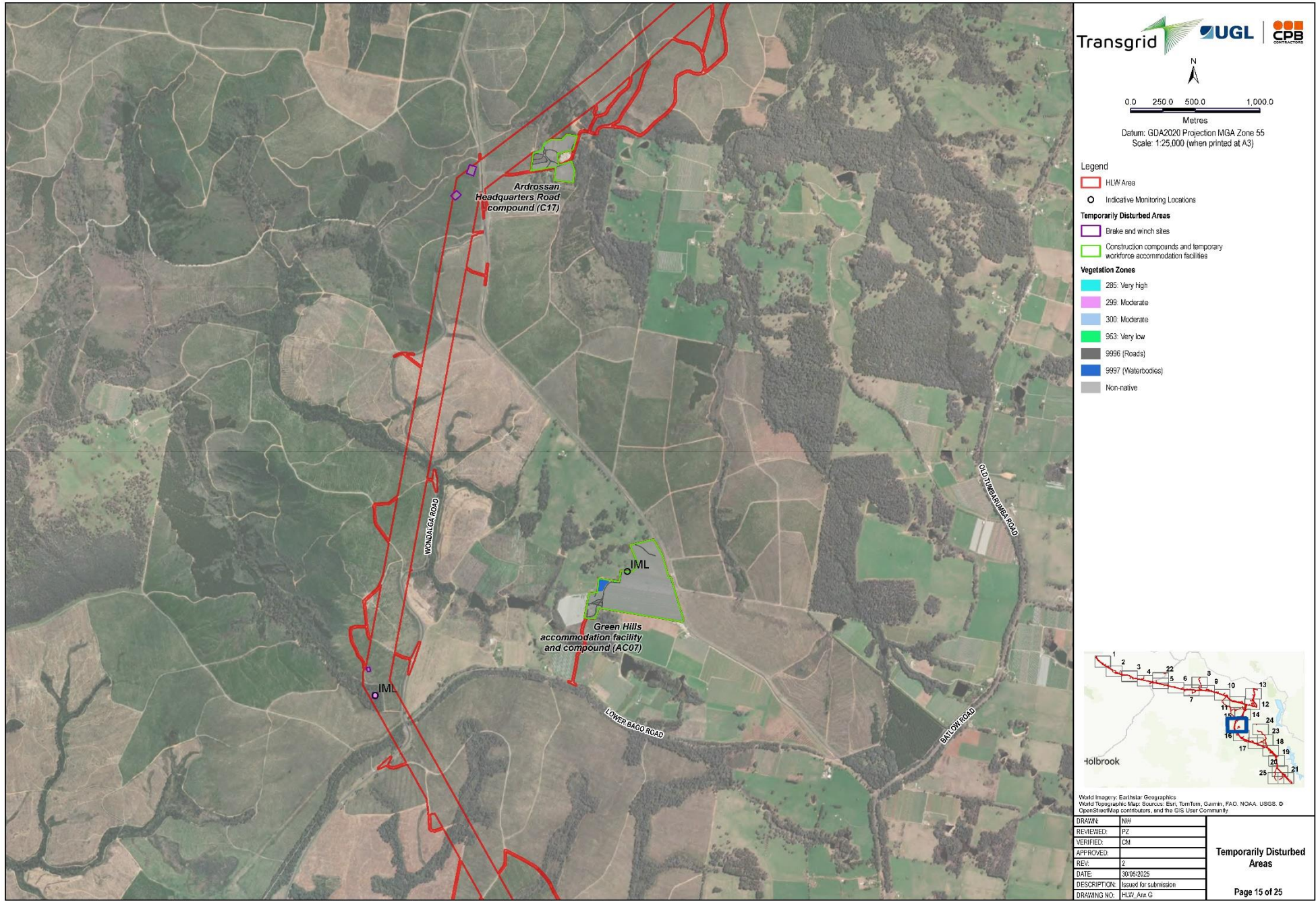
Temporarily Disturbed Areas
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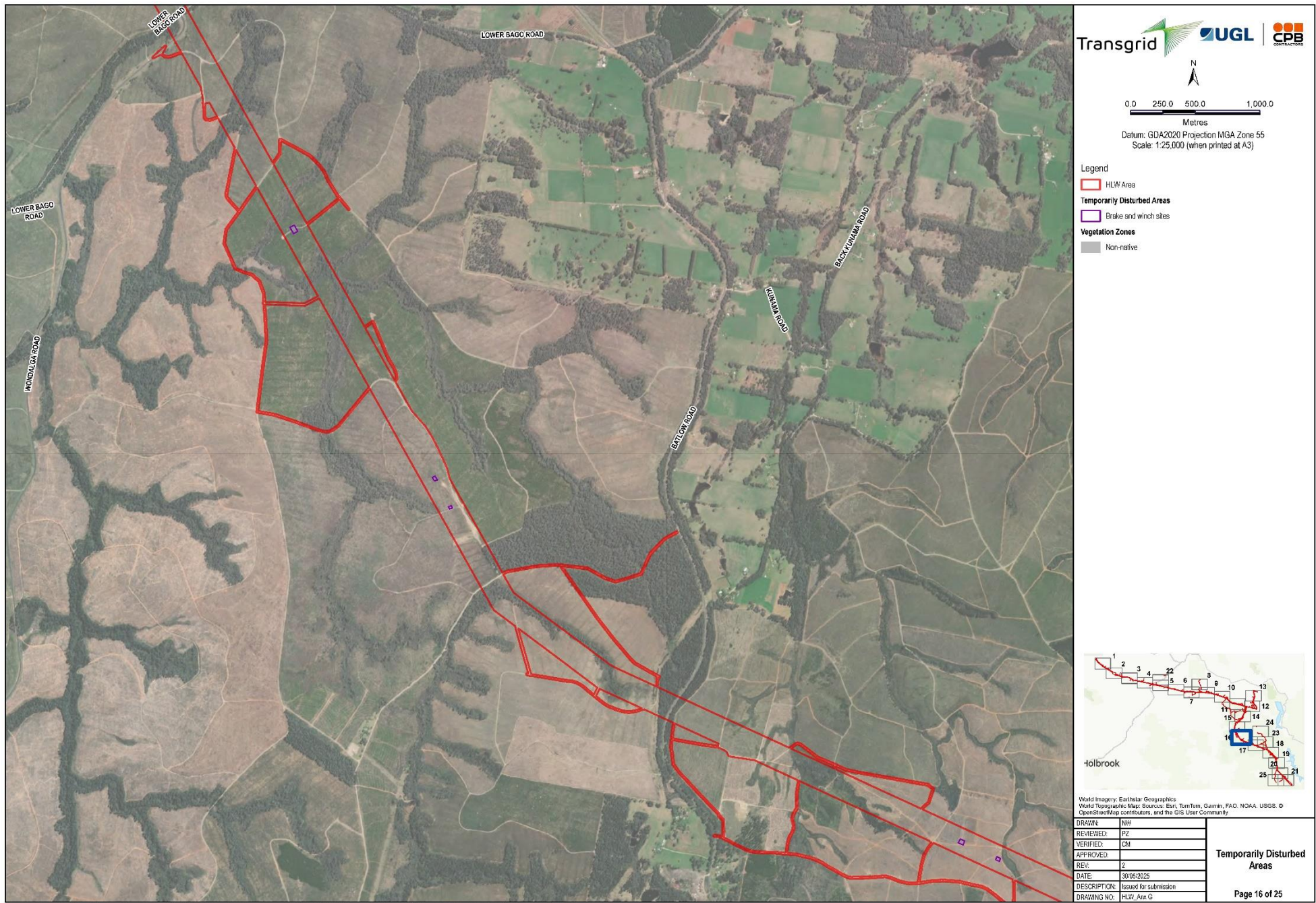




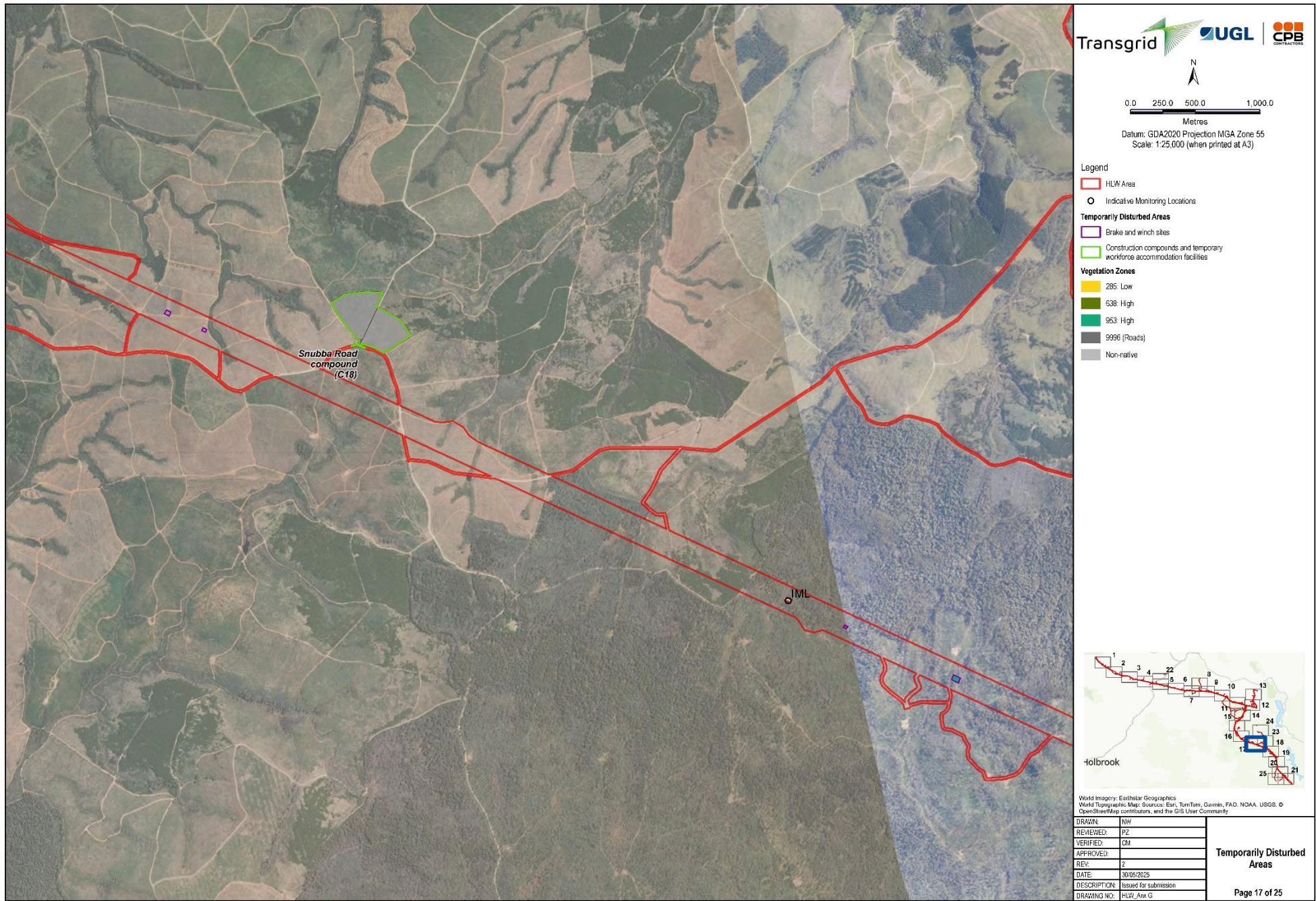


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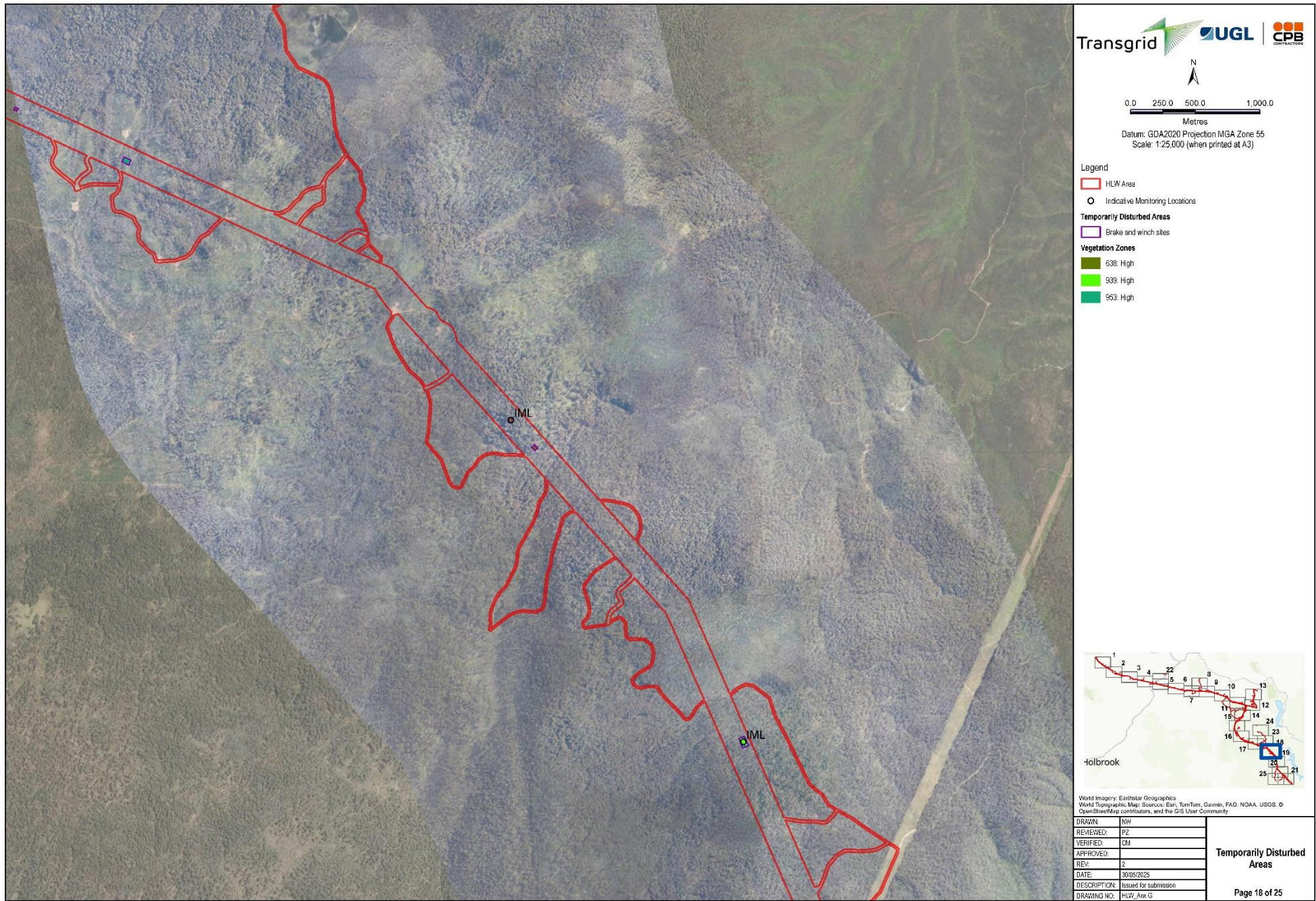


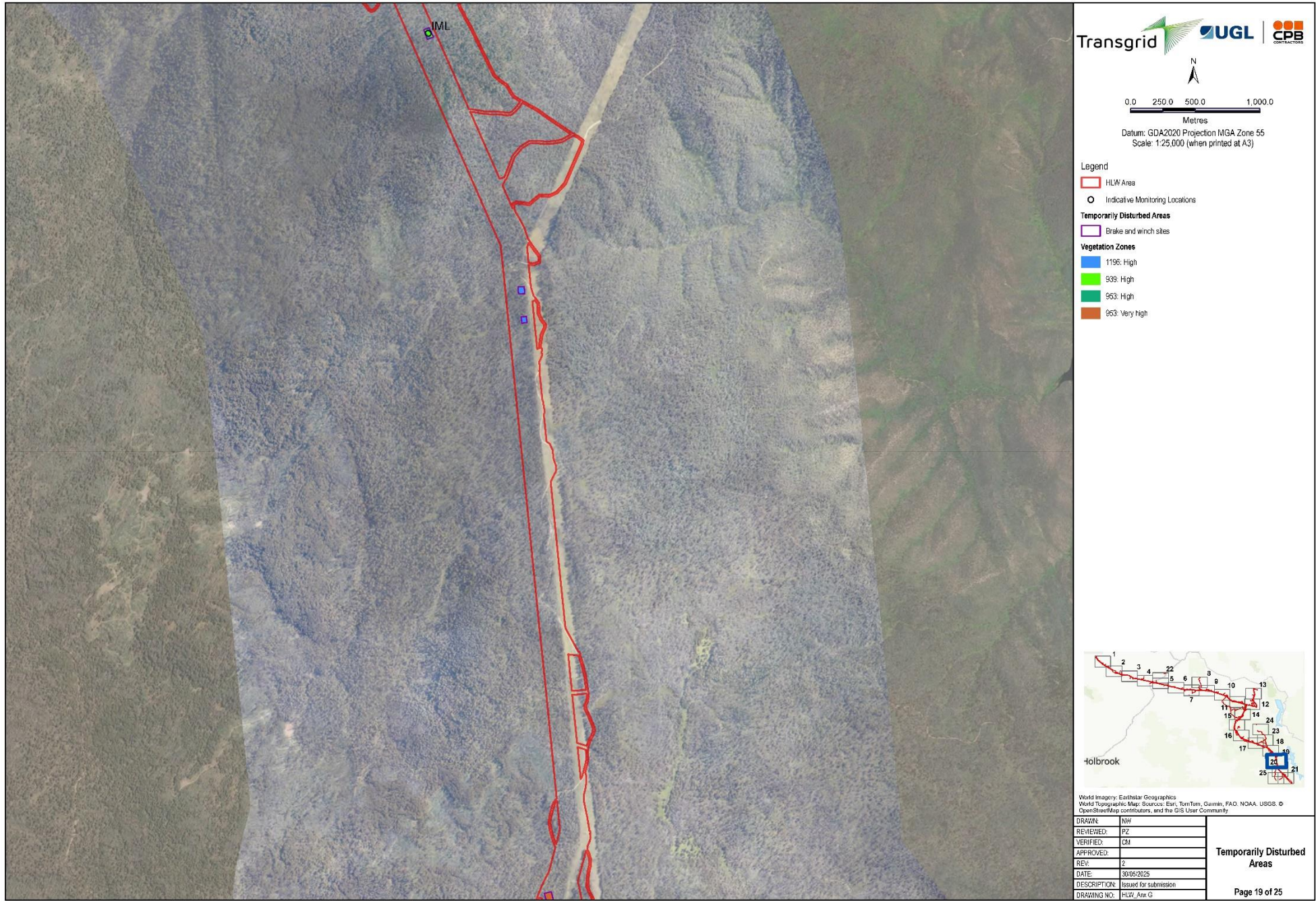


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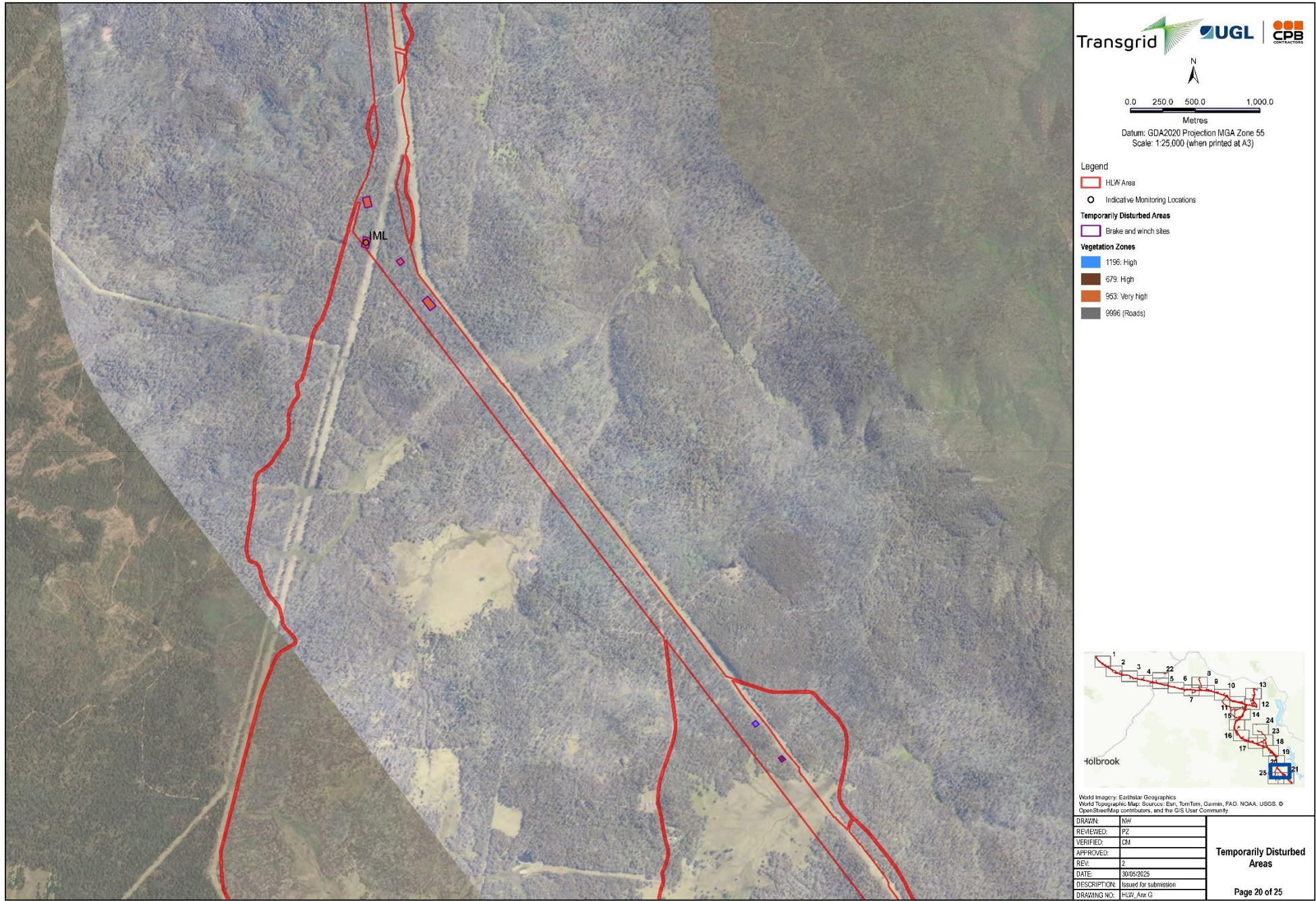


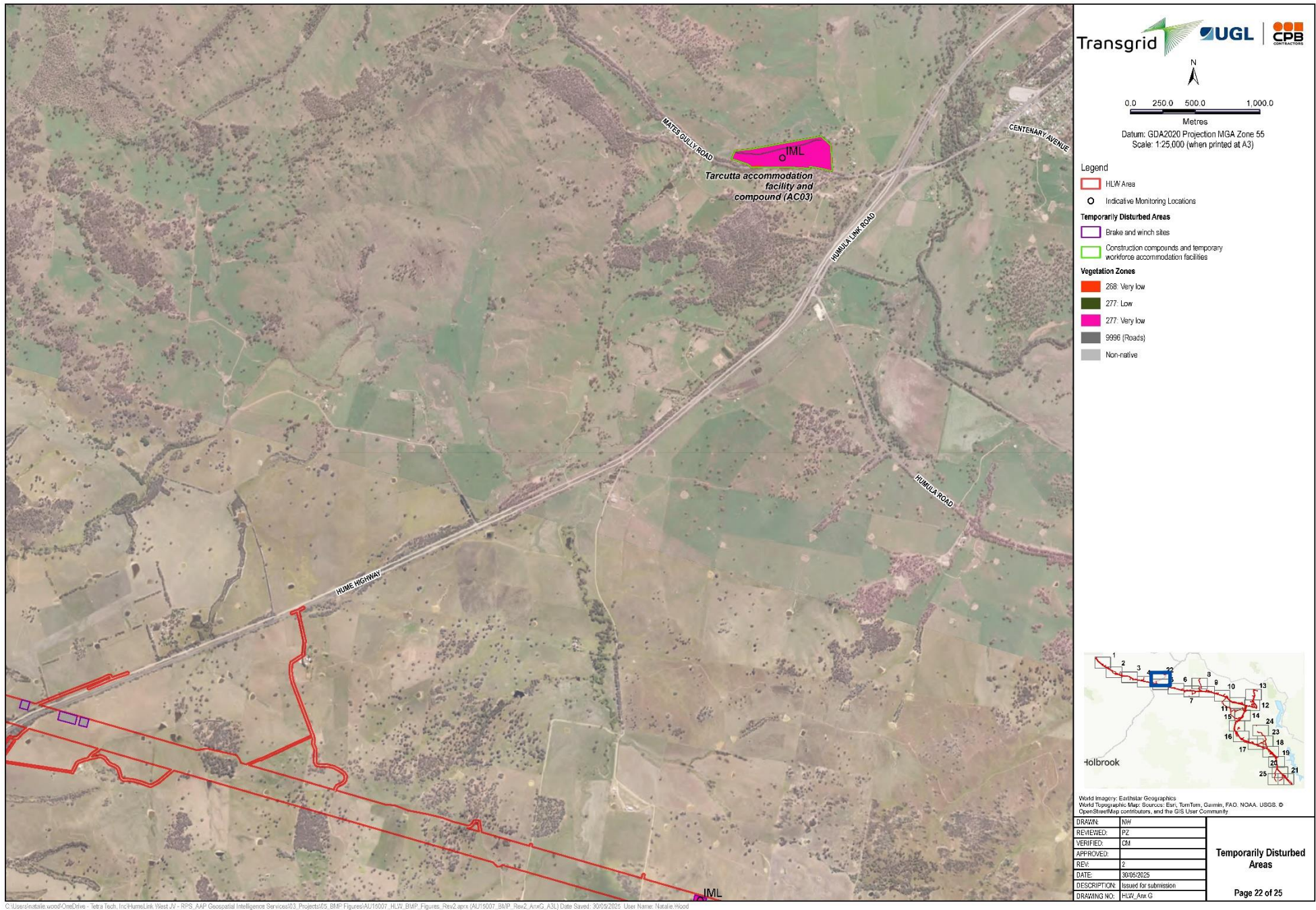
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4. Rehabilitation measures

Natural regeneration is the process by which native vegetation recovers in an area after disturbance or clearing without human intervention. It's a natural process relying on seeds or vegetative parts remaining in the ground to re-establish themselves. This is more likely to occur in areas of high resilience through biotic and abiotic factors such as soil health and the presence of a native seed bank. As such, this plan outlines measures to ensure temporarily disturbed areas are rehabilitated to a point of high resilience providing the ability to rely on natural process to recover from any later disturbances.

A large proportion of temporary disturbance areas occur on historically disturbed non-native vegetation with low resilience, consistent with Category 1 (exempt land) that will remain as agricultural and private lands. As such, rehabilitation measures detailed below prioritise areas of native vegetation pre-disturbance as displayed in Figure 3-1.

Rehabilitation efforts must be completed within 6 months of the completion of construction, upgrading or decommissioning of HLW. If for any reason rehabilitation cannot be achieved as per this plan (e.g. rejection by relevant land holder), evidence will be supplied and reasoning detailed per Section 5.2.

Due to potential safety and bushfire risks, all works must be undertaken in accordance with the HLW Bush Fire Emergency Management and Evacuation Plan as a priority. To ensure minimal indirect impacts to adjoining land, all works must be undertaken in accordance with:

- *Managing Urban Stormwater: Soils and construction - Volume 1* (the 'Blue Book'; Landcom 2004).
- HLW Erosion and Sediment Control Sub-Plan.
- HLW Soil and Water Management Sub-Plan.
- Relevant property management plans.

4.1. Salvage of resources

4.1.1. Soil

Soil management differs for areas of native vegetation and non-native vegetation (Category 1 exempt land), such as agricultural land. As detailed in Section 3.1.1, over 95 ha of temporarily disturbed land contains non-native vegetation at pre-disturbance conditions (accounting for 73% of temporarily disturbed areas). Topsoil stripping is not necessary for rehabilitation in such areas as they generally lack a native seedbank, however may be completed as required for earthworks/levelling.

The remaining 34.66 ha of temporarily disturbed areas contain native vegetation at pre-disturbance conditions and will require topsoil preservation or stripping and reuse to facilitate natural regeneration. Areas of temporary disturbance (such as some brake and winch sites) may undergo topsoil protection via geofabric or protective matting, thereby retaining soil seedbank, microbes and root balls. Topsoil stripping zones will be clearly marked prior to works commencing, with priority given to topsoil and root ball retention where practicable.

Native topsoil stripping will be undertaken in all areas of temporary disturbance, unless topsoil protection is undertaken as per above. This will involve the salvage of the top 10 cm of soil, including leaf litter and humus. This depth typically captures the seed bank and organic-rich layer without digging into the sterile subsoil. In wooded areas with thick leaf litter, collect the litter layer separately (for use as mulch later), then strip the underlying topsoil. Retaining the upper layer's integrity maximises the viability of seed and soil biota.

Stripping will be undertaken when soils are moist (i.e. not dry and susceptible to erosion, nor saturated and susceptible to runoff). If prolonged dry weather precedes stripping, light watering may be applied to achieve a workable moisture content, and conversely, wait for soils to drain after heavy rains. Soils will be removed in layers so that they may be returned in sequential order as part of rehabilitation,

ensuring separate handling of topsoil and subsoil (NSW RR, 2021).

Whenever possible, directly reuse stripped topsoil onto adjacent areas that are ready for rehabilitation, instead of stockpiling long-term. Direct transfer (i.e., strip and place) preserves seed viability and soil microbes by minimising storage time. If possible, coordinate construction scheduling so that restoration of one segment can occur soon after stripping, using the freshly stripped topsoil for the next segment. If direct placement is not feasible, proceed to proper stockpiling (refer Section 4.1.4 below).

4.1.2. Habitat features

Prior to the commencement of any works that would require vegetation removal, ground disturbance or stream crossing works (including during enabling works), the presence of materials that may be used in future rehabilitation efforts would be identified and marked by a suitable ecologist to maximise opportunities for salvage of biological and habitat resources (NSW RR, 2021). These efforts will be undertaken during pre-clearing surveys as detailed in Annexure B: Clearing Protocol of the HLW BMP. The salvage of hollow-bearing trees, hollow logs, tree stumps, fallen timber or boulders will be undertaken during the clearing process. Material that has not been marked during this process may also be salvaged for rehabilitation during any construction stage of HLW. Cleared logs and tree hollows that could provide fauna habitat include those where the total length of wood at least 10 cm in diameter and at least 0.5 m long. Opportunities to retain habitat features on-easement will be prioritised, particularly within connectivity corridors per Annexure F: Connectivity Strategy of the HLW BMP.

4.1.3. Seed

Local seed collection involves gathering seeds from native plants within the proximate healthy bushland areas. Collecting seeds locally ensures that the plants used during the rehabilitation process are well adapted to the local environment and the genetic diversity of local native plant populations are preserved, aiding in habitat restoration and promoting biodiversity for areas where native vegetation has been historically cleared, fragmented or heavily degraded.

Seed collection for HLW rehabilitation may be deemed necessary by suitably qualified specialists, such as for large temporary disturbance areas with pre-construction native vegetation (i.e., construction compounds and temporary workforce accommodation facilities; refer Figure 3-1). Only appropriate seed collection contractors will be utilised for such works, such as [TBD].

Standard seed collection methodology will be followed, including (OEH, 2011):

- Do not collect more than 20% of seed from any one plant.
- Avoid unnecessary damage (i.e., trampling of understory plants).
- Ensure nesting sites, tree hollows or other animal habitats are not disturbed.
- Do not remove more than 20% of the fruit from any one plant.
- Do not take more than 10% of plant material from any one plant.
- Avoid bringing weeds into the collection site.
- Take particular care when collecting from rare or threatened plants.

At minimum, seeds would be collected with the date, location and taxonomy recorded with samples.

The two most abundant PCTs required for rehabilitation constitute over 60% of temporary disturbance areas: PCT 277 & 290. While collection may be required from other communities listed in Table 3-1, seed collection from these two PCTs are considered likely to form the bulk of collection requirements.

Where possible, initial priority species for collection will consist of canopy and mid storey species, particularly slower growing species and species not commonly held in existing commercial seed banks. Collection of ground covers will also commence, however since the lead time for propagation of grasses and sedges is shorter, collection of this material will be a lower priority at the early stages of collection. The impact of recent bushfires will determine the availability of seed for collection. Grass

and forb species are expected to proliferate following the recent bushfire and this opportunity for collection should be maximised. A seed collection schedule is provided in Attachment 1 as guidance.

Seed collection may occur in any HLW Area prior to clearing. Given the relatively limited extent of the enabling works and subsequent rehabilitation, collection and propagation of seed will not be undertaken during enabling works.

4.1.4. Storage of materials

Adequate storage of salvaged materials is imperative for ensuring temporary disturbance areas will facilitate natural regeneration post-construction. Soil stockpiles will be designated in advance, away from traffic areas and at an appropriate distance from watercourses, on land that is level or gently sloping to minimise the potential for erosion and soil loss. Prioritisation of soil storage will be given to areas that are adjacent to the target community to preserve potential soil seed composition. Preference will be given to storing materials where those same materials will be used directly for rehabilitation at that location, eliminating the need for storage and re-handling, and maximising the viability of seed bank and topsoil biota (NSW RR, 2021).

Each stockpile will be kept as small and low as practicable, ideally no more than ~2 m high. Long, low windrows are preferred over tall mounds as they maximise surface area exposed to air and rainfall, sustaining aerobic microbes and allowing some seeds to germinate to the surface (NSW RR, 2020). If subsoil is also excavated for the project, stockpiles for topsoil and subsoil will be kept separately and clearly marked to avoid confusion during reuse. Erosion and sediment control will be implemented around soil stockpiles in line with the HLW Erosion and Sediment Control Sub-Plan. Compaction of the stockpiles will be avoided, and ongoing weed monitoring will occur per Annexure E: Biosecurity Plan of the HLW BMP.

If stockpiles will remain unused for >10 days, or if they are stored adjacent to any areas that have the potential to contaminate materials with exotic flora species by seed or other (i.e., agricultural lands), stockpiles will be stabilised via one of the following:

- Organic cover – spreading mulch or baled straw (certified weed-free straw/mulch) over the stockpile to help reduce erosion, insulate against extreme heat and retain moisture.
- Vegetative cover – seeding the stockpile with a quick-growing cover crop (e.g., sterile cereal grass, local native grass mix) to reduce wind/water erosion and maintain microbial activity.
- Geofabric – best for shorter-term coverage, using light coloured (heat reflecting) jute matting or geotextile fabric to prevent erosion and weed colonization.

The storage of woody debris and leaf litter within the area of disturbance or adjacent to construction sites may not be appropriate, given the potential increase of bushfire hazard by the storage of flammable material. The location of woody debris storage will be prioritised on sites that are not adjacent to native or planted vegetation, or adjacent to construction sites. The location of storage will be nominated prior to vegetation clearance.

Collected seeds will be stored in a controlled environment to maintain viability until they are required for propagation or direct seeding. Where necessary, pre-treatment methods such as soaking will be applied to improve germination rates. Selected species will be propagated at [TBD] with seedlings grown to an appropriate stage for out-planting. Nursery stock will be monitored for health, and planting will be aligned with optimal seasonal conditions to maximise survival rates.

4.2. Site preparation

4.2.1. Decommissioning

The restoration of land to pre-existing condition will occur progressively following completion of construction works at a temporary disturbance site. This would include the removal/remediation of the construction compounds and camp sites; removal of temporary facilities, site buildings and temporary environmental controls in accordance with the HLW Erosion and Sediment Control Sub-Plan and

landowner agreements. Works will be undertaken to:

- Decommission and remove all infrastructure including above and below ground to a depth of 500 mm.
- Restore fences, gates, etc., which may have been damaged during construction.
- Reform or remediate any sections of stream or waterway banks that are impacted or modified during construction works to resemble the pre-work condition and form wherever possible.
- Reinstatement of waterway banks impacted during construction 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.

Construction access tracks and access points will be retained for operational access, where required and practicable, in consultation with the relevant landowner.

4.2.2. Soil preparation

Soil preparation may be required in areas with overly compacted soil or high runoff. Soil preparation increases the likelihood of seeds germinating and preventing wash out from rainfall events. Types of soil preparation may include (GVA, 2003):

- Mounding in areas that are waterlogged and require drainage improvements.
- Grading of soils for water harvesting in regions with low rainfall.
- Furrow lining to improve water retention and reduce erosion.

Soil preparation will not be undertaken in any areas with established biodiversity values, such as patches of native grass (BCT, 2019). Soil preparation will not be undertaken in any areas with sandy or loamy soils that are susceptible to erosion. Soil preparation is not necessary in areas of non-native vegetation pre-disturbance (refer to Figure 3-1).

4.2.3. Fauna exclusion

Fauna exclusion fencing (including livestock exclusion fencing where practical) will be temporarily installed in line with relevant guidelines (BCT, 2019; BCT, 2021; BCT, 2024) following decommissioning at native rehabilitation sites (Figure 3-1), pending landowner approval. Fencing will reduce excessive disturbance and control pest animals from grazing on recovering vegetation (BCT, 2019). Fencing will remain installed until the ground cover and grass species populations are considered stable and resilient, as determined by the Project Ecologist.

4.2.4. Weed management

Temporarily disturbed areas will undergo weed management as detailed in Annexure E: Biosecurity Plan of the HLW BMP. Weed management across the disturbed areas would comprise identification of Weeds of National Significance (WoNS), Priority Weeds and invasive species, followed by weed control. Weed control may be required in areas of pre-disturbance non-native vegetation as agreed upon via relevant Property Management Plans.

4.3. Reuse of materials

4.3.1. Soil

Reusing topsoil is a critical component of rehabilitation as it preserves the native seed bank, soil microbial communities and organic matter necessary to facilitate natural regeneration. For reuse within pre-disturbance native vegetation areas (refer to Figure 3-1), topsoil must:

- Be adequately covered for a short period of time (<12 months).
- Be stockpiled proximal to the impact site (e.g., <1 km distance).

- Contain <10% high threat weed cover, and
- Contain no known or suspected pathogens.

Topsoil will be spread to a uniform depth of 50 mm for optimal seed germination. Only topsoil in dry or slightly moist conditions will be spread to prevent clumping, compaction or rutting. Machinery may involve a tracked excavator, backhoe or loader with a tilt bucket for gentle placement; avoiding driving heavy machinery directly over placed topsoil once spread. Topsoil reuse will ensure complete and uniform coverage of the temporarily disturbed area. After resspreading, the soil will be scarified / roughened to create shallow furrows along the contour; promoting water infiltration, preventing runoff and creating microsites for seed to lodge and germinate.

Following application, erosion protective measures may be required on sloped/exposed areas. This may include light jute mesh, coir blanket, or salvaged mulch (<50 mm depth & <50% coverage of target area; refer Section 4.3.2). Sediment fencing will be installed and maintained around rehabilitated areas.

In areas of non-native vegetation (Figure 3-1), land will be returned to pre-disturbance conditions in accordance with the relevant Property Management Plan. This may include the following:

- Regrading and stabilising soil.
- Allowing natural return to pasture or cropping unless otherwise agreed with landowner.

4.3.2. Habitat features

Reuse of terrestrial resources will be prioritised within designated connectivity corridors per Annexure F: Connectivity Strategy of the HLW BMP. However, such resources will also be distributed through areas of partial impact (i.e., Easement Clearing Zone, Hazard Tree Zone) and rehabilitated temporary disturbance areas to maximise rehabilitation efforts. Placement should prioritise areas immediately adjacent to that where collected, with similar suitable breeding habitat present. Placement must have regard for relevant HLW bushfire controls (refer Section 7.6 of the HLW BMP). Mulch will be a by-product of vegetation clearing activities. Where practicable, this material will be reused in the progressive rehabilitation works following replacement of topsoil. Guidelines for reuse of terrestrial resources is provided below.

Large Woody Debris (LWD; diameter >5 cm):

- Objective = provide shelter, basing and foraging habitat for ground-dwelling fauna.
- Reuse LWD to the maximum extent possible, in line with relevant HLW bushfire controls (refer Section 7.6 of the HLW BMP).
- Place LWD partially embedded in soil to mimic natural fall.
- Orient east-west to create microclimate variations.
- Place in clusters (not regular rows) across different microhabitats.
- Avoid full burial or excessive coverage with mulch.
- GPS and photo-document all installed features
- 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 (e.g., Forestry HumeLink License and landowner conditions). These requirements will be determined by the contractors prior to carrying out such works. Recommendations for placement of terrestrial microhabitats are detailed below.

Course Woody Debris (CWD; diameter <5 cm) & Mulch:

- Objective = promote nutrient cycling and microhabitat structure.
- Distribute thinly (<50 mm depth) and do not cover over 50% of the application area to avoid smothering of seedlings.

Rock refugia:

- Objective = provide shelter for reptiles, small mammals and invertebrates.
- Reuse rock refugia to the maximum extent possible.
- Layer rocks with air gaps and irregular cavities.
- Ideally place on north-facing slopes or sunlit areas.
- Create inset refuges at the base of native shrub clusters of riparian zones.
- GPS and photo-document all installed features

4.3.2.1. Aquatic habitats

Areas where crossing upgrades/in-stream works are required in Key Fish Habitat, the following rehabilitation efforts will be undertaken:

- Remediation of aquatic habitat that have been impacted or modified by HLW construction, to the condition prior to construction (or as close as practicable).
- Remediation of bank stability at waterway locations that have been impacted or modified by HLW construction, to condition equal or greater than prior construction.
- Installation of rocks, hydro mulch, jute matting or other suitable materials to stabilise banks where necessary.
- Return of excavated bed material to waterways (where practicable).
- Redeployment of aquatic habitat (CWD, LWD, boulders) within the waterway.

Placement of salvaged aquatic materials will be undertaken with guidance by the Project Ecologist. General guidance for in-stream placement of aquatic habitat features include:

- All works within Key Fish Habitat must be approved by DPI Fisheries.
- Placement must not obstruct fish passage, unless a natural barrier already exists.
- Install features once final grading, erosion controls and sediment removal are complete.
- Avoid in-stream works during fish breeding season (generally September-January for NSW inland rivers).

Rehabilitation will be undertaken with consideration of numerous target species habitat requirements and the character of the stream prior to disturbance, as detailed in Section 7.6.2 of the BMP.

Consultation with NSW DPI Fisheries will occur as part of this process regarding crossing designs and the potential occurrence of threatened aquatic species. Consultation will also confirm the appropriate method for storage and installation of aquatic habitat following the completion of construction.

Considerations may include incorporation of larger or smaller habitat features distributed in a way that mimics a natural distribution. Logs, trees or larger stumps (if used) may be cabled into position to reduce future erosion and loss of habitat features during flooding periods. Logs and woody vegetation debris may also be placed within the riparian zone to maintain channel structure.

The habitat requirements of specific aquatic species predicted to be associated with any one area should be used to further guide the placement of habitat features, as described in Section 7.6.2. of the BMP.

Where sufficient aquatic habitat is not able to be salvaged prior to construction, felled trees will be used to restore the waterway. Felled trees material may be acquired from HLW Areas where removal of vegetation has previously occurred, with a preference for vegetation sources from similar vegetation types that is present at each waterway crossing.

Care will be taken during rehabilitation to avoid creating physical or hydraulic barriers that would impede fish movement. Where in-stream or near-bank structures (i.e., erosion control devices, log placement or sediment traps) are installed, they will be assessed for their potential impact on fish passage. Structures will be designed to allow for continuous longitudinal movement of aquatic fauna, particularly during base flow conditions.

4.3.3. Seeding

Direct seeding involves sowing seed directly into the ground rather than transplanting already established seedlings. The benefits of direct seeding include its ability to generate large amounts of vegetation across large areas in a relatively short timeframe. It is also easy to customise the seed mix to suit local conditions and conservation outcomes (BCT, 2019).

Seeds may be sourced from local nurseries or obtained through seed collection detailed in Section 4.1.3. If necessary, a seed collection schedule provided in Attachment 1.

The following will be implemented during seeding:

- Seed mixture is to comprise a mix of flora species listed in Attachment 1. Optimal seeding times and climatic conditions should be considered and prioritised for each species.
- Preparation of soils will be completed (refer Section 4.2.2).
- On reasonably flat slopes, apply 15-20 g/m² of seed.
- On steep slopes, much higher rates would be required. Utilise mulch mat or straw mulch secured with jute matting to protect the seed and soil.
- Watering must be conducted immediately after seeding, followed by daily watering until establishment. Watering activities may be paused in wet weather conditions.
- Inspection of fauna exclusion fencing prior to seeding to ensure fence lines are stock proof.

If required, seeding in areas of non-native vegetation pre-disturbance will be completed in accordance with the relevant Property Management Plan. Areas of temporary disturbance within easement will be limited to seeding of groundcovers and low-lying shrubs (if needed) to maintain maximum line operating conditions.

4.3.3.1. KMG habitat

Direct seeding will be used in temporarily disturbed areas that are associated with KMG habitats (Figure 3-1). Flora species selected for direct seeding will provide a diverse range of grasses able to establish a native ground cover. Seed composition will be comprised of at a minimum the relevant flora species summarised in Table 4-1.

Table 4-1 Flora species selection for direct seeding in KMG habitats

Target species	Flora species selection
Key's Matchstick Grasshopper	<i>Acaena ovina</i> <i>Bulbine bulbosa</i> <i>Chrysocephalum apiculatum</i> & <i>Trifolium</i> sp. ² <i>Lomandra filiformis</i> subsp. <i>coriacea</i> <i>Podolepis jaceoides</i> <i>Poranthera microphylla</i> <i>Ranunculus lappaceus</i> <i>Themeda triandra</i> <i>Wurmbea dioica</i>

It is noted that whilst KMG is a generalist feeder that will use native and exotic species, it does not feed on *Themeda triandra* (TSSC, 2020). Revegetation efforts are to include *T. triandra* in combination with other selected food species (such as *Acaena ovina*).

² A common native pioneer species and readily available fodder crop that is suitable for direct seeding (Greening Australia, 2014). This species is not associated with targeted PCTs, therefore, this species should only be used if efforts to source seeds has been unsuccessful, or revegetation efforts have failed for the other listed species.

4.3.3.2. Timing

Where possible, seeding should occur in October, November and autumn months. This timing allows for adequate establishment/root growth before the heavy summer rainfall period but also allows the plants to go through a growth period soon after planting resulting in quicker establishment. Re-planting will be undertaken by a suitably qualified and experienced contractor who will be able to assess the site and develop a site-specific approach.

4.3.4. Maintenance

Areas of native topsoil reuse and/or seeding will require maintenance by suitably qualified specialists to achieve the objectives of this plan (refer Section 5.3). Maintenance activities include:

- Watering must be conducted immediately after application, followed by routine watering until establishment. Watering activities may be paused in wet weather conditions.
- Regular irrigation during warmer months to meet the recommended moisture level for the particular area, with consideration of the species present. The irrigation method and amount may vary between sites.
- Ongoing weed maintenance as per Annexure E: Biosecurity Plan of the HLW BMP.
- Inspection of fauna exclusion fencing to ensure fence lines are stock proof.
- Inspection of regenerating flora for signs of grazing/browsing and implement pest control as required.

4.4. Summary of rehabilitation measures

Rehabilitation measures outlined in this plan have been summarised in Table 4-2 below. These will be implemented to minimise construction impacts from HLW and ensure all commitments and requirements of approval will be adhered to. These specific management and mitigation measures have been developed to address the requirements of applicable legislation, the MCoA, the CoMA, the UMM and all Planning Approval Documentation, particularly the Revised BDAR.

Table 4-2 Rehabilitation measures

ID	Measure/Requirement	When to implement	Responsibility	Reference	Evidence
BMP35	Topsoil stripping zones will be clearly marked prior to works commencing at a temporary disturbance site, with priority given to topsoil and root ball retention where practicable. If deemed necessary, seed collection will occur. Storage of salvaged soil and seeds will follow guidelines provided in this plan.	Pre-construction	Environmental Manager Construction Manager Suitably qualified specialists	MCoA B30, B62, B63 CoMA 7 UMM B3, B18	Environmental Control Map Erosion and Sediment Control Plan
BMP36	Habitat features such as rocky outcrops, surface rock, dead wood, logs and coarse woody debris will be salvaged and relocated to adjacent and/or suitable woodland locations, pending consultation with the Project Ecologist. Relocation will prioritise areas of connectivity corridors per Annexure F: Connectivity Strategy of the HLW BMP, then areas of partial impact (i.e., Easement Clearing Zone, Hazard Tree Zone) and rehabilitated temporary disturbance areas. Placement will have regard for relevant bushfire controls.	Pre-construction and construction	Environmental Manager Construction Manager Project Ecologist	MCoA B25, B30, B62, B63 CoMA 2, 7 UMM B3, B18, B19	Pre-clearing Reports BMP Monitoring Report
BMP37	The restoration of land to pre-existing use will occur progressively following completion of construction works at a location. This would include works within waterways, the removal/remediation of the construction compounds and camp sites, removal of temporary facilities and site buildings and temporary environmental controls.	Construction	Environmental Manager Construction Manager	MCoA B30, B62, B63 CoMA 7 UMM B3, B18	BMP Monitoring Report

ID	Measure/Requirement	When to implement	Responsibility	Reference	Evidence
BMP38	Soil preparation, fauna exclusion fencing and weed management must be completed within 6 months of the completion of construction, upgrading or decommissioning of HLW.	Construction	Environmental Manager Construction Manager Suitably qualified specialists	MCoA B30, B62, B63 CoMA 7 UMM B3, B18	BMP Monitoring Report
BMP39	Rehabilitation is to include the reuse of natural resources including topsoil and mulch as well as seed collection (where relevant). This will be followed by maintenance such as watering and weeding to achieve targets listed in Table 5-2.	Construction	Environmental Manager Construction Manager Suitably qualified specialists	MCoA B30, B62, B63 CoMA 7 UMM B3, B18	BMP Monitoring Report
BMP40	Direct seeding will be used in temporarily disturbed areas that are associated with Keys Matchstick Grasshopper habitats (Figure 3-1). Seeding will be followed by maintenance to achieve appropriate survival rates.	Construction	Environmental Manager Construction Manager Suitably qualified specialists	MCoA B30 CoMA 7 UMM B3, B9	BMP Monitoring Report

5. Compliance management

5.1. Monitoring

Given the staged construction and decommissioning of HLW, monitoring and reporting of vegetation changes may be required during construction activities to ensure rehabilitation efforts in temporary disturbance areas facilitate natural regeneration of suitable native species. Any longer-term monitoring (post-construction) would be detailed within the Transgrid Operational Environmental Management Plan and should incorporate components of monitoring detailed below.

Monitoring will be completed by the Project Ecologist annually (spring) during construction works and will be compared against performance indicators listed in Section 5.3. This will involve two methods: plots and photo monitoring points, further detailed below. Monitoring locations are to be established and demarcated during the initial monitoring visit at each vegetation site via corner stakes, marked with GPS and flagging tape, to ensure repetition of monitoring events. Indicative monitoring locations are provided in Figure 3-1, targeting the following minimum monitoring locations:

- 1 monitoring location is required within the patch of rehabilitated KMG habitat.
- 1 monitoring location is required at each accommodation camp/ancillary facility.
- 1 monitoring location every 10 linear km of the alignment for all other temporary disturbance areas (i.e., brake and winch sites, rehabilitated temporary access tracks).

5.1.1. Plot-based monitoring

Plot-based monitoring must follow the methods outlined in the *Biodiversity Assessment Method* (BAM; DPIE 2020a). Established 20 m x 20 m plots (or 400 m² equivalent for linear areas) must be assessed with the information outlined in Table 5-1 recorded.

Table 5-1 Survey data required for plot-based monitoring (modified from the BAM [DPIE 2020a])

Attribute	Survey requirement
Growth form	Growth form for each recorded native species
Species name	Scientific name of each native and exotic species
Cover	Estimate the foliage cover of each native and exotic species within the boundaries of the plot including all attached plant material, alive or dead, rooted in or overhanging the plot. Cover should be recorded: • In decimals if less than 1% (e.g. 0.1, 0.2). • In whole numbers up to 5% (e.g. 1, 2, 3). • To the nearest 5% if >5% cover (e.g. 5, 10, 15, 20, 25).
Abundance rating	Count (when ≤10) or estimate (when >10) the number of individuals of each native and exotic species rooted within the plot. Record abundance as: • Counts of 1, 2, 3... • Estimates of 10, 20, 30... • 100, 200, 300... • 1000, 2000, 3000.
Erosion	Visual assessment of soil stability; record presence/absence and dimensions (length × width × depth) of: • Rills or gullies. • Exposed subsoil. • Sediment plumes downslope.

5.1.2. Photo monitoring points

Photo monitoring points will provide an indication of the success or failure of any areas of rehabilitation conducted. The quadrat used for Photo Monitoring Points is diagrammatically shown in Plate 5-1.

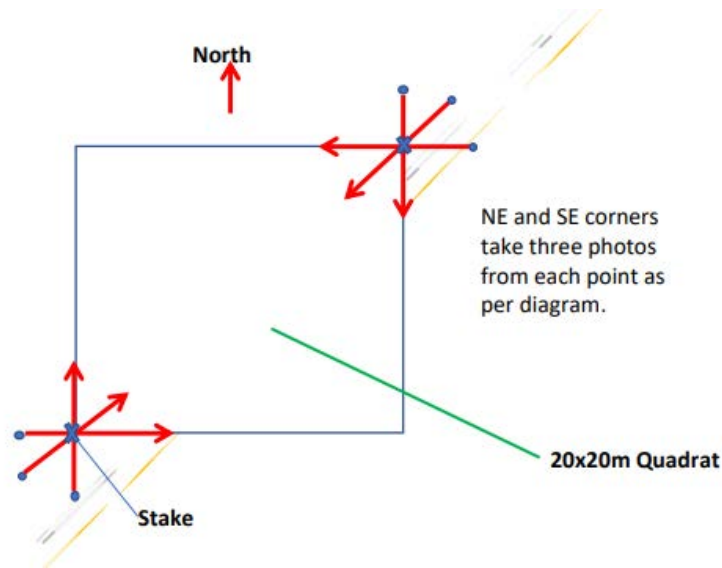


Plate 5-1 Photo monitoring point setup

5.2. Reporting

Following the completion of monitoring, all data will be collated and presented within the annual BMP Monitoring Report (refer to Section 8.6 of the HLW BMP). The report will include the following:

- Details of monitoring methods per Section 5.1.
- Assessment of rehabilitation success by annual plot data and reporting, with reference to performance indicators provided in Table 5-2. Photographic evidence of condition by photo points.
- Comparison of annual monitoring with previous year (if construction monitoring extends 2-years), as well as Revised BDAR data.
- Assessment of incidents and non-compliances based on the Trigger Action Response Plan in Table 5-2.
- Recommendations for future rehabilitation and/or corrective efforts (if necessary).
- If for any reason rehabilitation cannot be achieved as per this plan, evidence will be supplied and reasoning detailed within.

5.3. Incidents and non-compliances

Non-conformances, incident reporting and subsequent investigation associated with this rehabilitation plan will be undertaken as required in accordance with the Trigger Action Response Plan (TARP) provided in Table 5-2 below. HLWJV will promptly advise Transgrid on events that are non-conforming with this plan.

Table 5-2 Rehabilitation Plan TARP

Objective	Target	Performance indicator	Method of monitoring	Frequency	Trigger	Action/response plan
Rehabilitated KMG habitats	Maintain 85% survival rate of target seedlings. Maintain ≤10% cover of High Threat Weeds and ≤20% total weed cover.	Seedlings germinate at required rate. ≥85% survivorship of plantings.	Vegetation plots and photo monitoring points.	Annually	>15% target seedling mortality. >10% High Threat Weeds OR >20% total weed cover.	Implement supplementary seeding. Increase frequency of weed control per Annexure E: Biosecurity Plan of the HLW BMP. Reassess weed source pathways (e.g., vehicles, stockpiles) and address any barriers
Soil stability	Maintain a stable, non-eroding soil surface across rehabilitated temporary disturbance areas.	No rill or gully erosion >5 cm deep or 1 m long in >95% of the site.	Vegetation plots and photo monitoring points.	Annually	Visible rill/gully erosion in >5% of the site area.	Install/repair erosion controls (e.g., jute matting, coir logs). Regrade of contour site to slow runoff. Reapply topsoil or mulch as needed.
Groundcover re-establishment	Re-establish ≥80% total groundcover of which ≥80% is native.	Measured cover of live vegetation and abundance of native species.	Vegetation plots and photo monitoring points.	Annually	<70% native groundcover after 18 months OR total live vegetation cover <80%.	Infill with native mulch or topsoil. Targeted seeding with native grasses and forbs. Maintain fauna exclusion fencing and exclude human traffic.
Native	Facilitate recruitment	Number and	Vegetation plots	Annually	<5 native species	Evaluate seedbank condition.

Objective	Target	Performance indicator	Method of monitoring	Frequency	Trigger	Action/response plan
species regeneration	of ≥5 native species, including at least 2 functional groups (e.g., grass, forb, shrub).	diversity of naturally regenerating native species.	and photo monitoring points.		detected after 2 growing seasons.	Targeted seeding with native species. Consider soil inoculation or scarification.
Weed suppression	Maintain ≤10% cover of High Threat Weeds and ≤20% total weed cover.	Weed cover and abundance.	Vegetation plots and photo monitoring points.	Annually	>10% High Threat Weeds OR >20% total weed cover.	Increase frequency of weed control per Annexure E: Biosecurity Plan of the HLW BMP. Reassess weed source pathways (e.g., vehicles, stockpiles) and address any barriers.
Self-sustainability	Rehabilitated sites are stable and trending towards natural regeneration without further intervention.	No active management required beyond routine monitoring.	Vegetation plots and photo monitoring points.	Annually	Any site requiring re-intervention after year 2.	Reassess ecological function and soil-health. Implement secondary rehabilitation (e.g., deep ripping, re-mulching, seeding). Consider active revegetation. Extend monitoring and maintenance timeline.

6. References

- Biodiversity Conservation Trust [BCT] (2019) *Restoring Native Vegetation. Guidelines for assisted regeneration and revegetation*. Retrieved from: <https://www.bct.nsw.gov.au/sites/default/files/2019-08/Restoring%20Native%20Vegetation%20Guidelines.pdf>
- BCT (2021) *Livestock grazing guidelines. Guidelines for private land conservation*. Retrieved from: <https://www.bct.nsw.gov.au/resources/managing-your-land/grazing>
- BCT (2024) *Essential conservation fencing infrastructure: Guidelines, standards and cost benchmarks*. Retrieved from: <https://www.bct.nsw.gov.au/resources/managing-your-land/human-impacts-infrastructure>
- Buchanan R (2009). *Restoring natural areas in Australia*. NSW Industry and Investment
- Department of Agriculture, Water and Environment [DAWE] (2021b) *Enhancing Remnant Vegetation Pilot. Management Protocol: Central West NRM Region (NSW)*. Retrieved from: [Enhancing Remnant Vegetation Pilot Management Protocol: Central West NRM Region \(NSW\) \(agriculture.gov.au\)](https://www.agriculture.gov.au/remnant-vegetation-pilot-management-protocol-central-west-nrm-region)
- Department of Environment [DoE] (2015). *Arrive Clean, Leave Clean – Guidelines to help prevent the spread of invasive plant diseases and weeds threatening our native plants, animals and ecosystems*. Retrieved from: <https://www.agriculture.gov.au/sites/default/files/documents/arrive-clean-leave-clean.pdf>
- Department of Planning, Infrastructure and Environment [DPIE] (2020a) *Biodiversity Assessment Method 2020*. Available at: <https://www.environment.nsw.gov.au/research-and-publications/publications-search/biodiversity-assessment-method-2020>
- DPIE (2020b). *Hygiene guidelines. Protocols to protect priority biodiversity areas in NSW from Phytophthora cinnamomi, myrtle rust, amphibian chytrid fungus and invasive plants*. Retrieved from: <https://www.environment.nsw.gov.au/research-and-publications/publications-search/hygiene-guidelines>
- Greening Australia Victoria (GVA) (2003) *Revegetation techniques. A guide for establishing native vegetation in Victoria*. Retrieved from: https://www.greeningaustralia.org.au/wp-content/uploads/2017/11/GUIDE_A-guide-for-establishing-native-vegetation-in-Victoria.pdf
- Greening Australia (2017) *A Revegetation Guide for Temperate Grasslands*. Retrieved from: https://www.greeningaustralia.org.au/wp-content/uploads/2017/11/GUIDE_A-revegetation-guide-for-temperate-grasslands.pdf
- Landcom (2004). *Managing Urban Stormwater: Soils and Construction 4th Ed. The Blue Book*. Retrieved from: <https://www.environment.nsw.gov.au/research-and-publications/publications-search/managing-urban-stormwater-soils-and-construction-volume-1-4th-edition>
- Manning et al., 2011. Integrating research and restoration: The establishment of a long-term woodland experiment in south-eastern Australia. Available at: https://www.researchgate.net/publication/273169366_Integrating_research_and_restoration_The_establishment_of_a_long-term_woodland_experiment_in_south-eastern_Australia
- Niche Environment and Heritage Pty Ltd (2023). *HumeLink Biodiversity Development Assessment Report EIS Technical Report 1*. Version: August 2023
- New South Wales Department of Climate Change, Energy, Environment and Water [NSW DCCEEW] (2022) *Species Profile and Threats Database Keyacris scurra – Key's Matchstick Grasshopper*. https://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=89739 Accessed 21 June 2024
- NSW Resources Regulator [NSW RR] (2020). *Targeted Assessment Program, Guidance note: Materials and soil management*. Retrieved from:

https://www.resources.nsw.gov.au/sites/default/files/documents/guidance-note_materials-and-soil-management-tap.pdf

NSW RR (2021). *Rehabilitation Controls (Guideline)*. Retrieved From:

<https://www.resources.nsw.gov.au/sites/default/files/documents/guideline-rehabilitation-controls.pdf>

Office of Environment and Heritage [OEH] (2012) *Conservation Management Notes Natural regeneration*. Retrieved from: Conservation Management Notes - Natural Regeneration (nsw.gov.au)

OEH (2024) *Keys Matchstick Grasshopper – Profile*. Retrieved from

<https://threatenedspecies.bionet.nsw.gov.au/profile?id=20368>

Platt, S. (1992) *Natural regeneration: principles and practice*. Retrieved from: Natural regeneration: principles and practice (VIC) (swift.net.au)

TERN (2023) Coarse Woody Debris Model. In 'Ecological Field Monitoring Protocols Manual Using the Ecological Monitoring System Australia. Retrieved from: https://www.tern.org.au/wp-content/uploads/EMSA-Manual_Coarse-Woody-Debris-Module_v1_20230721.pdf

Threatened Species Scientific Committee [TSSC] (2019) *Conservation assessment of Keyacris scurra (Rehn 1952) Key's Matchstick Grasshopper (Morabidae)*. Retrieved from:

<https://www.environment.nsw.gov.au/resources/threatenedspecies/determinations/CAMKeysMatchstickGrasshopperESPD.pdf>

Transgrid (2023). *HumeLink Vegetation Clearing Method and Management Memorandum*, Rev 1

TSSC (2020) *Notice of and reasons for the final Determination Keyacris scurra*. Retrieved from:

<https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Animals-and-plants/Scientific-Committee/Determinations/2020/keyacris-scurra-keys-matchstick-grasshopper-final-determination.pdf>

TSSC (2022). *Notice and reasons for the final Determination Synemon plana*. Retrieved from:

<https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Animals-and-plants/Scientific-Committee/Determinations/2022/final-determination-synemon-plana.pdf> Accessed 20/06/2024

UGL Pty Ltd (2024). HumeLink West, Construction Environmental Management Plan.

Yagui (2024). *Key's Matchstick Grasshopper (Keyacris scurra) Expert Report – HumeLink project*

Attachment 1 Indicative seed collection schedule

Species	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
<i>Acacia dealbata</i>	x										x	x
<i>Acacia kettwelliae</i>	x											x
<i>Acacia melanoxylon</i>	x											x
<i>Acacia rubida</i>	x										x	x
<i>Acaena novae-zelandiae</i>											x	x
<i>Acrotriche serrulata</i>											x	x
<i>Aristida ramosa</i>	x											
<i>Asperula scoparia</i>	x											x
<i>Austrodanthonia eriantha</i>	x											x
<i>Austrostipa bigeniculata</i>	x	x	x							x	x	x
<i>Austrostipa scabra subsp. scabra</i>	x											x
<i>Austrostipa verticillata</i>	x	x								x	x	x
<i>Bothriochloa macra</i>			x	x								
<i>Brachyloma daphnoides</i>											x	x
<i>Brachyloma daphnoides subsp. daphnoides</i>											x	x
<i>Carex appressa</i>	x											x
<i>Cassinia aculeata</i>		x	x									

Species	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
<i>Cassinia longifolia</i>	x	x										
<i>Cassinia uncata</i>		x	x									
<i>Daviesia latifolia</i>												x
<i>Dillwynia phyllicoides</i>	x	x								x	x	x
<i>Echinopogon ovatus</i>											x	x
<i>Eucalyptus albens</i>	x	x	x	x	x	x	x	x	x	x	x	x
<i>Eucalyptus blakelyi</i>	x	x										
<i>Eucalyptus bridgesiana</i>	x	x										x
<i>Eucalyptus camphora</i> subsp. <i>humeana</i>	x	x										
<i>Eucalyptus dalrympleana</i> subsp. <i>dalrympleana</i>	x	x	x	x	x							x
<i>Eucalyptus dives</i>											x	x
<i>Eucalyptus goniocalyx</i>	x	x	x	x	x	x	x	x	x	x	x	x
<i>Eucalyptus macrorhyncha</i>	x	x	x	x	x	x	x	x	x	x	x	x
<i>Eucalyptus melliodora</i>			x	x								
<i>Eucalyptus microcarpa</i>	x	x	x	x	x						x	x
<i>Eucalyptus pauciflora</i>			x	x								
<i>Eucalyptus polyanthemos</i>						x	x	x	x	x	x	
<i>Eucalyptus robertsonii</i> subsp. <i>robertsonii</i>			x									
<i>Eucalyptus rossii</i>			x									
<i>Eucalyptus stellulata</i>	x	x										x

Species	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
<i>Eucalyptus viminalis</i>			x									
<i>Exocarpos strictus</i>			x									
<i>Geranium solanderi</i> var. <i>solanderi</i>	x	x										x
<i>Glycine clandestina</i>			x									
<i>Gonocarpus tetragynus</i>			x									
<i>Goodenia hederacea</i> subsp. <i>hederacea</i>	x	x								x	x	x
<i>Hibbertia obtusifolia</i>			x									
<i>Hovea linearis</i>										x	x	x
<i>Juncus holoschoenus</i>			x									
<i>Lagenifera stipitata</i>			x									
<i>Leptospermum continentale</i>	x	x	x	x	x	x	x	x	x	x	x	x
<i>Lomandra filiformis</i> subsp. <i>coriacea</i>			x									
<i>Lomandra filiformis</i> subsp. <i>filiformis</i>	x	x	x									
<i>Lomandra longifolia</i>			x									
<i>Lomatia myricoides</i>							x					
<i>Microlaena stipoides</i> var. <i>stipoides</i>						x	x	x				
<i>Mirbelia oxylobioides</i>						x	x	x				
<i>Panicum effusum</i>	x	x	x									
<i>Persoonia chamaepitys</i>						x	x	x				

Species	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
<i>Phragmites australis</i>					x	x	x					
<i>Platylobium formosum</i> subsp. <i>formosum</i>												x
<i>Poa induta</i>	x	x								x	x	x
<i>Poa meionectes</i>	x	x								x	x	x
<i>Poa sieberiana</i>	x	x								x	x	x
<i>Poa sieberiana</i> var. <i>sieberiana</i>	x	x								x	x	x
<i>Polystichum proliferum</i>						x	x	x	x	x		
<i>Pteridium esculentum</i>		x	x									
<i>Rubus parvifolius</i>	x	x										x
<i>Senecio bathurstianus</i>	x	x										x
<i>Stellaria pungens</i>						x	x	x	x			
<i>Stypandra glauca</i>											x	
<i>Themeda australis</i>	x											x
<i>Xanthorrhoea glauca</i> subsp. <i>angustifolia</i>				x								

Annexure H

Biodiversity Monitoring Program

HumeLink West

Document Number: HLW-HLJV-PRW-ENM-PLN-000001H

Revision: 3

TransGrid
Date 28/07/2025

Document Control

Approvals

Title	HumeLink West Biodiversity Monitoring Program
Endorsed by Environment Representative	Derek Low (Wolfpeak Group Ltd Pty)
Approved on behalf of HLWJV by	Tim Burns
Signed	
Dated	

Version Control

Revision	Date	Description	Approval
A	3/07/2024	Preliminary draft	Paul Dudding
B	19/08/2024	Update following TG review	Paul Dudding
1	20/12/2024	Updates following receipt of final MCoA & CoMA	Tim Burns
2	4/06/2025	Updates following ER, FCNSW & CPHR review	Tim Burns
3	28/07/2025	Updates following ER & CPHR review	Tim Burns

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Abbreviations

Abbreviation	Expanded text
BACI	Before-After-Control-Impact
BAM	Biodiversity Assessment Method
BC Act	<i>Biodiversity Conservation Act 2016</i> (NSW)
BCS	Biodiversity Conservation and Science group within DCCEEWS – NSW (now referred to as CPHR)
BCT	Biodiversity Conservation Trust
BDAR	Biodiversity Development Assessment Report
BMP	Biodiversity Management Sub-plan
BAVR	Biodiversity Assessment Verification Report
CEMP	Construction Environmental Management Plan
CoMA	Commonwealth Conditions of Ministerial Approval
Cth	Commonwealth of Australia
CPHR	Conservation Programs, Heritage & Regulation Division (formerly BCS)
DCCEEWS - Cth	The Commonwealth Department of Climate Change, Energy, the Environment and Water
DCCEEWS – NSW ¹	The NSW Department of Climate Change, Energy, the Environment and Water (formerly DPE)
DPE	Department of Planning and Environment (now known as NSW DCCEEWS)
DPI	Department of Primary Industries
DPIE	Department of Planning, Industry and Environment (now known as NSW DCCEEWS)
DPHI	Department of Planning, Housing and Infrastructure
ECZ	Easement Clearing Zone
EHNV	Epizootic Haematopoietic Necrosis Virus
EIS	Environmental Impact Statement
EPBC Act	<i>Environmental Protection and Biodiversity Conservation Act 1999</i> (Cth)
FCNSW	Forestry Corporation New South Wales
FPM	Faecal Pellet Monitoring
GPS	Global Positioning System
HLW	The HumeLink West Stage of the HumeLink project
HLWJV	HumeLink West Joint Venture (UGL Limited and CPB Contractors)

¹ As of the 1st January 2024 the NSW Department of Planning and Environment has split into the Department of Climate Change, Energy, the Environment and Water (NSW) and the Department of Planning, Housing and Infrastructure. DCCEEWS (NSW) includes the environmental regulators (such as NSW EPA, CPHR, NPWS, DPE-Water), while the Department of Planning, Housing and Infrastructure (DPHI) includes planning regulatory services.

Abbreviation	Expanded text
HLW Area	Approved disturbance footprint of the HumeLink West Stage of the HumeLink project
HTZ	Hazard Tree Zone
KFH	Key Fish Habitat
MCoA	NSW Minister's Conditions of Approval
NPWS	National Parks and Wildlife Service
NSW	New South Wales
PCT	Plant Community Type
PCVR	Partial Clearing Validation Report
RAA	Rapid Aquatic Assessment
RCMS	Remote Camera Monitoring Sites
Revised BDAR	<i>HumeLink Biodiversity Development Assessment Report Rev 0</i> (Niche Environment and Heritage Pty Ltd, June 2024)
RPS	RPS AAP Consulting Pty Ltd
SAII	Serious And Irreversible Impact
SAT	Spot Assessment Technique
SBAS	Supplementary Biodiversity Strategy
SWMP	Soil and Water Management Plans
TARP	Trigger Action Response Plan
TCZ	Total Clearing Zone
TEC	Threatened Ecological Community
UMM	Updated Environmental Management Measure as outlined in the Planning Approvals Documentation

1. Introduction

1.1. Context

This Biodiversity Monitoring Program forms part of the Biodiversity Management Sub-plan (BMP) of the HumeLink West project (HLW) Construction Environmental Management Plan (CEMP). The program has been prepared to outline and describe how the UGL Limited and CPB Contractors Joint Venture (HLWJV), during the construction of HLW, will comply with the Minister's Conditions of Approval (MCoA), the Federal Minister for Water and Environment Condition of Ministerial Approval (CoMA), the Updated Environmental Management Measures (UMM), and undertake its duties in accordance with the Planning Approval Documentation listed under the MCoA A2.

1.2. Purpose

The purpose of this program is to detail the biodiversity monitoring requirements which are to be implemented during construction of HLW. Specifically, this program details the monitoring activities that shall be undertaken to track indirect and prescribed impacts of project construction activities. Monitoring will provide feedback on the efficacy of the implemented environmental management measures at mitigating indirect biodiversity impacts of construction.

This program describes the HLWJV program for monitoring during construction in order to minimise potential indirect and prescribed impacts on threatened species and their habitats. The program aims to address relevant actions and mitigation measures outlined in the following documents:

- Mitigation measures B3, B8, B12 and B22 of the HumeLink Biodiversity Development Assessment Report Rev 0 (BDAR; Niche Environment and Heritage Pty Ltd, June 2024).
- Condition B25, B28, B29 and B30 of the Minister's Conditions of Approval (MCoA) A2.
- Condition 6 and 7 of the Federal Minister for Water and Environment Condition of Ministerial Approval.

1.3. Objective

The objective of this program is to provide early warning of ineffective measures and/or uncertain impacts that may compromise the mitigation measures and threaten exceedance of the predicted impacts of HLW construction. The scope includes the following:

- Identify entities that require monitoring during construction.
- Specify the existing extent of monitoring entities.
- Detail the monitoring methods including performance criteria.
- Provide measurable thresholds to identify when remedial action is triggered.
- Provide adaptive management response/actions.

2. Environmental requirements

2.1. Relevant documents and guidelines

The main document relevant to this program is the *HumeLink Biodiversity Development Assessment Report Rev 0* (Revised BDAR; Niche Environment and Heritage Pty Ltd, June 2024). Refer to Section 5 for a full list of referenced documents and research articles.

Results of the Supplementary Biodiversity Strategy (SBAS) & Biodiversity Assessment Verification Report (BAVR) will be incorporated as an addendum to this program within three months (as necessary).

2.2. Permits and licences

The permits and licences relevant to this program include:

- All Project Ecologists must, at a minimum, hold a Scientific Licence under Part 2 of the *Biodiversity Conservation Act 2016* (including Animal Ethics Approval) for fauna handling, rescue and monitoring/survey works.

2.3. Preparation of this program

In accordance with MCoA B30a, this program has been prepared by suitably qualified and experienced biodiversity experts of RPS AAP Consulting Pty Ltd:

- Polina Zadorojnaya (BSc; BAM Accredited Assessor BAAS 23014).
- Joe Baird (BSc).
- Chelsea Tiller (BSc).

2.4. Consultation

Consultation undertaken in preparation of this program is summarised in Section 4 and Annexure J: Consultation Report of the HLW BMP. If consultation with relevant stakeholders or regulators is required to assess the efficacy of mitigation strategies detailed in this program, these will be undertaken in accordance with Section 8.3 of the HLW BMP.

2.5. Minister's Conditions of Approval

The MCoA relevant to this program are listed in Table 2-1. A cross reference is also included to indicate where and how the conditions are addressed in this program or other HLW management documents.

Table 2-1 MCoA relevant to this program

MCoA No.	Condition Requirements	Document Reference
Restrictions 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	This program includes monitoring of partial clearing zones (Section 4.2) and PCT 637 (Section 4.6) to ensure clearing limits are not exceeded. Refer to the HLW BMP, including Annexure B: Clearing Protocol for additional measures to address this condition.
	(b) minimise: (i) The impacts of the development on hollow-bearing trees. (ii) The impacts of the development on threatened flora and fauna populations. (iii) The clearing of native vegetation and key habitat.	This plan includes provisions for monitoring impacts in partial clearing zones (i.e., native vegetation; Section 4.2), flora (Section 4.3), fauna (Section 4.4 through 4.5) and Threatened Ecological Communities (Section 4.6) to ensure impacts are minimised per this condition.
	(c) not undertake any works that result in ground disturbance within a minimum setback distance of 50 metres from PCT 637 – Alpine and sub-alpine peatlands, damp herbfields and fens, South Eastern Highlands Bioregion and Australian Alps Bioregion and 30 metres from known locations of <i>Prasophyllum bagoense</i>, <i>Prasophyllum</i>	This program includes monitoring of threatened orchids (Section 4.3) and PCT 637 no-go zones

MCoA No.	Condition Requirements	Document Reference
	<i>keltonii</i> and <i>Pterostylis oreophila</i> as mapped in the BDAR.	(Section 4.6) to ensure impacts are avoided to these entities. Refer to the HLW BMP, including Annexure B: Clearing Protocol for additional measures to address 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 CPHR and to the satisfaction of the Planning Secretary. Unless otherwise agreed by the Planning Secretary, the Strategy must:	Results of Supplementary Biodiversity Strategy will be incorporated into this program as relevant (Section 2.1).
	(a) be peer reviewed by a suitably qualified, experienced and independent biodiversity consultant with <i>Biodiversity Assessment Method</i> (2020) (BAM) Accreditation whose appointment has been endorsed by the Planning Secretary;	
	(b) detail survey methods for all entities to be targeted by the Strategy, in accordance with the <i>Biodiversity Assessment Method</i> (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;	

MCoA No.	Condition Requirements	Document Reference
	(ii) surveys for the following serious and irreversible impact (SAIL) entities: ▪ <i>Prasophyllum bagoense</i> ▪ <i>Pterostylis oreophila</i> ▪ <i>Caladenia concolor</i> ▪ <i>Genoplesium superburn</i> ▪ <i>Pomaderris delicatata</i> ▪ <i>Litoria castanea</i> ▪ <i>Prasophyllum innubum</i> ▪ <i>Solanum armourense</i> ▪ <i>Calotis glandulosa</i> ▪ <i>Grevillea iaspicula</i> ▪ <i>Pomaderris pallida</i> ▪ <i>Mixophyes balbus</i> ▪ <i>Prasophyllum keltonii</i> ▪ <i>Bossia fragrans</i> ▪ <i>Eucalyptus robertsonii</i> subsp. <i>hemisphaerica</i> ▪ <i>Grevillea wilkinsonii</i> ▪ <i>Chalinolobus dwyeri</i> ▪ <i>Pseudomy fumeus</i> ▪ <i>Pimelea bracteata</i> ▪ <i>Tyto tenebricosa</i>	
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 CPHR and to the satisfaction of the Planning Secretary. The Report must:	Results of Biodiversity Assessment Verification Report will be incorporated into this program as relevant (Section 2.1).

MCoA No.	Condition Requirements	Document Reference
	(a) be prepared by a suitably qualified, experienced and independent biodiversity consultant with <i>Biodiversity Assessment Method</i> (2020) (BAM) Accreditation whose appointment has been endorsed by the Planning Secretary;	
	(b) be prepared in accordance with the <i>Biodiversity Assessment Method</i> (2020) and any other guidance document that is relevant and applicable at the time surveys were undertaken or the BDAR was prepared;	
	(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;	
	(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;	
	(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.	
	Any required changes to biodiversity offset or mitigation measures arising from the Biodiversity Assessment Verification Report must be incorporated into an updated version of	

MCoA No.	Condition Requirements	Document Reference
	the Biodiversity Offset Package under condition B26 in consultation with CPHR and BCT and addressed in a revised version of the Biodiversity Management Plan required under condition B30, in consultation with CPHR and FCNSW, to the satisfaction of the Planning Secretary.	
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 program forms part of the BMP.
	(a) be prepared by a suitably qualified and experienced biodiversity expert/s;	Section 2.3
	(b) be prepared in consultation with CPHR and FCNSW;	Section 2.4
	(c) be prepared generally in accordance with the <i>Revised Biodiversity Development Assessment Report</i> (Revision 0, dated 21 June 2024);	Section 2.1 and Table 2-3
	(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;	Results of Supplementary Biodiversity Strategy and Biodiversity Assessment Verification Report will be incorporated into this program as relevant (Section 2.1).
	(ii) minimising: ▪ the amount of vegetation clearing on site; ▪ the loss of key fauna habitat (including tree hollows);	This plan includes provisions for monitoring impacts in partial clearing zones (i.e., native vegetation; Section

MCoA No.	Condition Requirements	Document Reference
	- the impacts of fauna on site, including undertaking pre-clearance surveys; and - potential indirect impacts on threatened flora and fauna species;	4.2), flora (Section 4.3), fauna (Section 4.4 through 4.5) and Threatened Ecological Communities (Section 4.6) to ensure impacts are minimised per this condition.
	(iii) ensuring the development does not adversely affect the native vegetation and habitat outside the disturbance footprint;	This plan includes provisions for monitoring impacts Threatened Ecological Communities in no-go zones (outside of the disturbance footprint; Section 4.6). Refer to the HLW BMP, including Annexure B: Clearing Protocol for additional measures to address this condition.
	(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 CPHR (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;	Not addressed in this program – refer Annexure D: Unexpected Finds Procedure of the HLW BMP
	(v) connectivity strategy for the potentially impacted species identified in the <i>Revised Biodiversity Development Assessment Report</i> (Revision 0, dated 21 June 2024)	Not addressed in this program – refer Annexure C:

MCoA No.	Condition Requirements	Document Reference
	and a Supplementary Hollow and Nest Strategy;	Hollow and Nest Strategy & Annexure F: Connectivity Strategy of the HLW BMP
	(vi) protecting the conservation values of McPhersons Plain and avoiding impacts to <i>Prasophyllum bagoensis</i> , <i>Prasophyllum keltonni</i> and <i>Pterostylis oreophila</i> ;	This program includes provisions for monitoring threatened orchids (Section 4.3) to ensure impacts to these species are avoided.
	(vii) rehabilitating temporary disturbance areas to facilitate natural regeneration of suitable native species;	Not addressed in this program – refer Annexure G: Rehabilitation Plan of the HLW BMP
	(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 4.2.
	(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;	This program includes provisions for monitoring the reuse of resources in partial clearing zones (Section 4.2). Refer Annexure F: Connectivity Strategy & Annexure G: Rehabilitation Plan of the HLW BMP for additional measures to address this condition.

MCoA No.	Condition Requirements	Document Reference
	(x) collecting and propagating seed (where relevant);	Not addressed in this program – refer Annexure G: Rehabilitation Plan of the HLW BMP
	(xi) controlling erosion, weeds and feral pests;	Not addressed in this program – refer Annexure E: Biosecurity Management Plan of the HLW BMP
	(xii) bushfire management;	Not addressed in this program – refer Section 7.6 of the HLW BMP
	(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	This program includes provision for monitoring indirect impacts to <i>Pimelea bracteata</i> (Section 4.3) and Sooty Owl (Section 4.4).
	(e) include a program to monitor, evaluate and publicly report on the effectiveness of these measures.	Section 3.1.
	Following the Planning Secretary's approval, the Proponent must implement the Biodiversity Management Plan. <i>Note: The Biodiversity Management Plan must incorporate all relevant aspects of the development, including Enabling Works consistent with the requirements of condition B67.</i>	Section 2.3.

2.6. Federal Minister for Water and Environment Condition of Ministerial Approval

The CoMA relevant to this program are listed in Table 2-2. A cross reference is also included to indicate where and how the conditions are addressed in this program or other HLW management documents.

Table 2-2 CoMA relevant to this program

CoMA No.	Condition Requirements	Document Reference
Field Verification Efforts		
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.	Results of Supplementary Biodiversity Strategy and Biodiversity Assessment Verification Report will be incorporated into this program as relevant (Section 2.1).
Biodiversity Management Plan		
7	The approval holder must comply with condition B30 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.	Refer Table 2-1.

2.7. Updated Management Measures

UMMs relevant to this program are listed in Table 2-3 below. A cross reference is also included to indicate where and how the conditions are addressed in this program or other HLW management documents.

Table 2-3 UMMs relevant to this program

UMM No.	Condition Requirements	HLW Stage	Applicable location(s)	Document Reference
Biodiversity				
B3	A Biodiversity Management Plan (BMP) will be prepared in consultation with NSW DCCEE 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 <i>Technical Report 1 – Revised Biodiversity Development Assessment Report</i> , including:	Detailed design and construction	All locations	This program forms part of the BMP to evaluate and report on the effectiveness of all mitigation measures (Section 4.1).
	Measures to minimise impacts to biodiversity, 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.			Not addressed in this program – refer Annexure B: Clearing Protocol of the HLW BMP. Monitoring relevant to this condition is summarised in Section 4.1.
	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.			

UMM No.	Condition Requirements	HLW Stage	Applicable location(s)	Document Reference
	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 bushrock) identified in <i>Technical Report 1 – Revised Biodiversity Development Assessment Report</i> 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.			Not addressed in this program – refer Annexure F: Connectivity Strategy & Annexure G: Rehabilitation Plan of the HLW BMP. Monitoring relevant to this condition is summarised in Section 4.1.
	Proposed rehabilitation of temporary disturbance areas including management and maintenance measures.			Not addressed in this program – refer Annexure G Rehabilitation Plan of the HLW BMP. Monitoring relevant to this condition is summarised in Section 4.1.
	Unexpected species finds protocol to be implemented if threatened ecological communities, flora and fauna species, not assessed in <i>Technical Report 1 –</i>			Not addressed in this program – refer Annexure D:

UMM No.	Condition Requirements	HLW Stage	Applicable location(s)	Document Reference
	<i>Revised Biodiversity Development Assessment Report</i> , are encountered during pre-clearing inspections.			Unexpected Finds Procedure of the HLW BMP
	A description of biosecurity protocols for plant and equipment movement between sites, including species specific measures.			Not addressed in this program – refer Annexure E Biosecurity Plan of the HLW BMP. Monitoring relevant to this condition is summarised in Section 4.1.
	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.			Not addressed in this program – refer Section 7.4 of the HLW BMP.
	Outline monitoring and compliance management requirements.			This program includes provision for monitoring of all management requirements (Section 3.1), as well as monitoring and compliance management for partial clearing zones (Section 4.2), and indirect impacts to threatened entities (Section 4.3 through Section 4.6).
	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			Not addressed in this program – refer Annexure C: Hollow & Nest Strategy of the HLW BMP. Monitoring

UMM No.	Condition Requirements	HLW Stage	Applicable location(s)	Document Reference
	eggs and chicks will be avoided where possible). This could include potentially new poles/nest platforms.			relevant to this condition is summarised in Section 4.1.
	Details on the pre-clearing and clearing supervision process.			Not addressed in this program – refer Annexure B: Clearing Protocol of the HLW BMP.
	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.			Not addressed in this program – refer Section 7.7 of the HLW BMP
	Procedures for reporting the outcomes of pre-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).			Not addressed in this program – refer Annexure G: Rehabilitation Plan of the HLW BMP. Monitoring relevant to this condition is summarised in Section 4.1.
	Procedures for the stockpiling and supply of felled trees for KFH rehabilitation or improvement works, including procedures for consultation with DPI Fisheries.			

UMM No.	Condition Requirements	HLW Stage	Applicable location(s)	Document Reference
	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 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.			This program includes provisions for all components of this condition.

UMM No.	Condition Requirements	HLW Stage	Applicable location(s)	Document Reference
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).	Detailed design and construction	Threatened frog habitats within 250 m downstream of the project footprint. Potential construction monitoring site locations have been identified at Adjungbilly Creek, Brungle Creek, Yaven Creek and Adelong Creek (Figure 13-2 of Technical Report 1 – Revised Biodiversity Development Assessment Report).	Not addressed in this program – refer Section 7.1 of the HLW BMP.
	Where avoidance is not possible: Waterway crossing designs should avoid instream structures to minimize 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 minimize 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 minimize the spread of pathogens and exotic weeds during and post-construction (in line with Hygiene protocols for the control of diseases in Australian frogs [Cth DCCEEW, 2011]).			Not addressed in this program – refer Annexure E: Biosecurity Management Plan of the HLW BMP. Monitoring relevant to this

UMM No.	Condition Requirements	HLW Stage	Applicable location(s)	Document Reference
				condition is summarised in Section 4.1.
	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.			Section 4.5
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.	Construction	All locations where hollow bearing trees are being removed	Not addressed in this program – refer Annexure C: Hollow & Nest Strategy of the HLW BMP. Monitoring relevant to this condition is summarised in Section 4.1.
	The strategy would be captured in the BMP (as per 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			

UMM No.	Condition Requirements	HLW Stage	Applicable location(s)	Document Reference
	- 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.			
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,	Detailed design and construction	All locations	Not addressed in this program – refer Annexure E: Biosecurity Management Plan of the HLW BMP. Monitoring relevant to this

UMM No.	Condition Requirements	HLW Stage	Applicable location(s)	Document Reference
	Control and Biosecurity zones as per the NSW Biosecurity Act 2015.			condition is summarised in Section 4.1.
	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, Phytophthora cinnamomi, exotic rust fungi and Epizootic Haematopoietic Necrosis Virus (EHNV) and the introduction of new 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			

UMM No.	Condition Requirements	HLW Stage	Applicable location(s)	Document Reference
	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.			
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 <i>Fish passage in streams: Fisheries guidelines for design of stream crossings</i> (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.	Operation	Transmission line corridor -access track waterway crossing	Not included in this program as it is limited to construction – to be detailed in Transgrid Operational Environmental Management Plan.

3. Monitoring scope

As detailed in Section 6 of the BMP, HLW may have indirect impacts (including prescribed and uncertain impacts) on threatened flora and fauna, native Plant Community Types (PCTs) within and adjacent to the HLW Area and aquatic species and their habitats.

While direct impacts are easily quantified and controlled by managing the extent of clearing within the disturbance area, indirect impacts are subject to the efficacy of the implemented environmental controls. As such, direct impacts are defined during project design, whereas indirect impacts are mitigated through the effective environmental management of construction. As a result, this program is focused on monitoring those entities which have been identified within the HLW Area with potential to experience indirect impacts during construction.

3.1. BMP monitoring

The HLW BMP includes the following annexures to ensure HLW minimises and mitigates impacts to biodiversity during construction:

- **Annexure B: Clearing Protocol** – described the clearing protocol for vegetation clearing and aquatic works during construction of HLW, in order to mitigate potential impacts caused to flora, fauna and aquatic entities.
- **Annexure C: Hollow and Nest Strategy** – mitigates the impacts of clearing required for HLW by identifying target species and prescribing the necessary processes to manage nests and install/manage fauna habitats (artificial hollows) for impacted fauna species.
- **Annexure D: Unexpected Finds Procedure** – implemented following the sighting of any known or suspected threatened entities within the HLW Area.
- **Annexure E: Biosecurity Management Plan** – describes the management of weeds, pests and pathogens throughout the construction phase of HLW.
- **Annexure F: Connectivity Strategy** – maintains connectivity in areas identified as facilitating fauna movement, particularly for target species which may be impacted by HLW.
- **Annexure G: Rehabilitation Plan** – guides the rehabilitation of temporarily disturbed areas during the construction of HLW.
- **Annexure H: Biodiversity Monitoring Program** (this document).

Monitoring and reporting requirements detailed in the HLW BMP and above listed annexures are detailed in Section 4.1. For details specific to each monitoring or reporting event, please refer to each individual document/annexure.

3.2. Justification for threatened entity monitoring

Threatened entities to be monitored through construction of HLW are derived from those detailed in Section 5 of the HLW BMP.

3.2.1. Threatened flora

Monitoring of threatened flora aims to detect and manage indirect construction-related impacts such as dust deposition, altered hydrology, edge effects, weed incursion, trampling or erosion. Monitoring activities would be targeted at threatened flora that are not subject to direct clearing or habitat disturbance, however remain ecologically sensitive to nearby construction activities within a 30 m buffer.

Flora species located within approved disturbance zones, including the Easement Clearing Zone (ECZ) and Hazard Tree Zone (HTZ), are not included in monitoring as indirect impacts have been accounted for through biodiversity offsetting. The focus of threatened flora monitoring is therefore within retained vegetation, where early detection of indirect impacts is essential in maintaining ecological function and regulatory compliance.

Thirty threatened flora species are known or are assumed to be present within the HLW Area, based on data obtained in the Revised BDAR. Monitoring of threatened flora will occur for all known species where individual have been identified within 30 m of disturbance zones. Currently, five flora species will be subject to monitoring as summarised in Table 3-1. Although no monitoring sites have been prescribed for the remaining 25 assumed present threatened flora species, monitoring sites will be added as necessary for threatened individuals identified within 30 m of disturbance zones through Biodiversity Assessment Verification Reporting or pre-clearing surveys. Monitoring methods will be consistent with that detailed in this program.

Table 3-1 Justification for threatened flora to be monitored

Scientific Name	Common Name	BC Act Status	EPBC Act Status	SAII?	Known or assumed habitat	Included in program?
<i>Acacia ausfeldii</i>	Ausfeld's Wattle	V	-	False	Assumed habitat	No
<i>Ammobium craspedioides</i>	Yass Daisy	V	V	False	Known	Yes
<i>Bossiaea fragrans</i>	-	CE	CE	TRUE	Assumed habitat	No
<i>Caesia parviflora</i> var. <i>minor</i>	Small Pale Grass-lily	E	-	False	Assumed habitat	No

Scientific Name	Common Name	BC Act Status	EPBC Act Status	SAII?	Known or assumed habitat	Included in program?
<i>Caladenia concolor</i>	Crimson Spider Orchid	E	V	TRUE	Assumed habitat	No
<i>Caladenia montana</i>	-	V	-	False	Assumed habitat	No
<i>Calotis glandulosa</i>	Mauve Burr-daisy	V	V	TRUE	Assumed habitat	No
<i>Calotis pubescens</i>	Max Mueller's Burr-daisy	E	-	False	Assumed habitat	No
<i>Cullen parvum</i>	Small Scurf-pea	E	-	False	Assumed habitat	No
<i>Diuris tricolor</i>	Pine Donkey Orchid	E	-	False	Assumed habitat	No
<i>Glycine latrobeana</i>	Clover Glycine	CE	V	TRUE	Assumed habitat	No
<i>Grevillea wilkinsonii</i>	Tumut Grevillea	CE	CE	TRUE	Assumed habitat	No
<i>Leucochrysum albicans</i> subsp. <i>tricolor</i>	Hoary Sunray	E	E	False	Assumed habitat	No
<i>Persoonia marginata</i>	Clandulla Geebung	V	V	False	Assumed habitat	No
<i>Pimelea bracteata</i>	-	CE	CE	TRUE	Known	Yes
<i>Pomaderris cotoneaster</i>	Cotoneaster Pomaderris	E	E	False	Assumed habitat	No
<i>Prasophyllum bagoense</i>	Bago Leek Orchid	CE	CE	TRUE	Known	Yes

Scientific Name	Common Name	BC Act Status	EPBC Act Status	SAII?	Known or assumed habitat	Included in program?
<i>Prasophyllum innubum</i>	Brandy Marys Leek-orchid	CE	CE	TRUE	Assumed habitat	No
<i>Prasophyllum keltonii</i>	Kelton's Leek Orchid	CE	CE	TRUE	Known	Yes
<i>Prasophyllum petilum</i>	Tarengo Leek Orchid	E	E	False	Assumed habitat	No
<i>Pterostylis alpina</i>	Alpine Greenhood	V	-	False	Assumed habitat	No
<i>Pterostylis foliata</i>	Slender Greenhood	V	-	False	Assumed habitat	No
<i>Pterostylis oreophila</i>	Blue-tongued Greenhood	CE	CE	TRUE	Assumed habitat	No
<i>Pultenaea humilis</i>	Dwarf Bush-pea	V	-	False	Assumed habitat	No
<i>Senecio garlandii</i>	Woolly Ragwort	V	-	False	Assumed habitat	No
<i>Swainsona recta</i>	Small Purple-pea	E	E	False	Assumed habitat	No
<i>Swainsona sericea</i>	Silky Swainson-pea	V	-	False	Assumed habitat	No
<i>Thelymitra alpicola</i>	Alpine Sun-orchid	V	-	False	Assumed habitat	No
<i>Thesium australe</i>	Austral Toadflax	V	V	False	Assumed habitat	No
<i>Xerochrysum palustre</i>	Swamp Everlasting	-	V	False	Known	Yes

V = Vulnerable; E = Endangered; CE = Critically Endangered; - = not listed

3.2.2. Threatened fauna

Monitoring of threatened fauna aims to detect and manage indirect construction-related impacts such as noise, vibration, edge effects and altered hydrology, particularly on specialist breeding habitat. Ecosystem credit species are threatened species whose occurrence can generally be predicted by vegetation surrogates and/or landscape features, or that have a low probability of detection using targeted surveys. Under the *Biodiversity Assessment Method 2020* (BAM: DPIE 2020), no targeted surveys are required for ecosystem credit species. Likewise, threatened fauna considered for monitoring as part of this program have excluded ecosystem credit species associated with HLW.

Twenty-eight threatened fauna species were identified, or are assumed to be present, within the HLW Area. Table 3-2 provides an overview of these fauna, including justification for their inclusion/exclusion for monitoring as part of this program.

Table 3-2 Justification for threatened fauna to be monitored

Scientific Name	Common Name	BC Act Status	EPBC Act Status	SAIL?	Included in program?	Justification
<i>Aprasia parapulchella</i>	Pink-tailed Legless Lizard	V	V	False	No	Pink-tailed Legless Lizard has been assumed present adjacent to disturbance zones. Habitat surveys will be undertaken for this species as part of the pre-clearing process, including provisions for buffer/exclusion zone if individuals are identified. Indirect impacts associated with this species will be managed through the provision of Annexure F: Connectivity Strategy to maintain connectivity corridors for this species, which will also undergo monitoring. This species occurs in widespread habitats (open grassy and rocky areas) which will be retained throughout the ECZ, HTZ and surrounding areas. Therefore, indirect impacts are expected to have negligible effects on a potential population of Pink-tailed Legless Lizard and this species has been excluded from further monitoring.

Scientific Name	Common Name	BC Act Status	EPBC Act Status	SAII?	Included in program?	Justification
<i>Burhinus grallarius</i>	Bush Stone-curlew	E	-	False	No	This species has been assumed present within the HLW Area. However, the Revised BDAR considers the Bush Stone-curlew to have a low likelihood of occurrence due to low levels of woody debris within associated PCTs. Furthermore, widespread suitable habitat occurs across the locality for this species, and indirect/prescribed impacts associated with HLW are expected to have a negligible effect on a population of Bush Stone-curlew. As such, this species has been excluded from monitoring.
<i>Callocephalon fimbriatum</i>	Gang-gang Cockatoo	E	E	False	Yes	Two breeding hollows for the Gang-gang Cockatoo were recorded during the Revised BDAR. These occur within a 100 m buffer from disturbance zones, however will be retained. Threatened fauna breeding habitat surveys will be undertaken for this species as part of the pre-clearing process. This includes the provision of buffer/exclusion zone if nest trees are identified. Potential indirect impacts to this species also include noise and vibration through potential blasting and/or crushing activities. Noise and vibration assessment for crushing and blasting will occur for this species prior to such activities. Ongoing monitoring of specialist breeding habitat has also been included as part of this monitoring program.

Scientific Name	Common Name	BC Act Status	EPBC Act Status	SAII?	Included in program?	Justification
<i>Calyptorhynchus lathami lathami</i>	South-eastern Glossy Black-Cockatoo	V	V	False	Yes	No South-eastern Glossy Black-Cockatoo individuals or breeding trees were identified within or surrounding the HLW Area. However, habitat is assumed present adjacent to disturbance zones. Threatened fauna breeding habitat surveys will be undertaken for this species as part of the pre-clearing process. This includes the provision of buffer/exclusion zone if nest trees are identified. Potential indirect impacts to this species also include noise and vibration through potential blasting and/or crushing activities. Noise and vibration assessment for crushing and blasting will occur for this species prior to such activities. Ongoing monitoring of specialist breeding habitat has also been included as part of this monitoring program, however no monitoring sites are prescribed as this species is currently assumed present. If pre-clearing surveys or biodiversity verification reporting identify this species within 100 m of disturbance zones, monitoring will occur in those locations.

Scientific Name	Common Name	BC Act Status	EPBC Act Status	SAII?	Included in program?	Justification
<i>Cercartetus nanus</i>	Eastern Pygmy-possum	V	-	False	No	Eastern Pygmy-possum has been assumed present adjacent to disturbance zones. Threatened fauna breeding habitat surveys will be undertaken for this species as part of the pre-clearing process. This includes the provision of buffer/exclusion zone if nest trees are identified. Indirect impacts associated with this species will be managed through the provision of Annexure C: Hollow and Nest Strategy to replace impacted hollows, as well as Annexure F: Connectivity Strategy to maintain connectivity corridors; each of which contains monitoring of such provisions (Section 4.1). This species occurs in a broad range of habitats from rainforest through sclerophyll (including Box-Ironbark) forest and woodland to heath. It shelters in tree hollows, rotten stumps, holes in the ground, abandoned bird-nests, Ringtail Possum dreys or thickets of vegetation. Such habitats are widespread throughout the HLW Area and surrounds. Therefore, this species has been excluded from additional monitoring.

Scientific Name	Common Name	BC Act Status	EPBC Act Status	SAII?	Included in program?	Justification
<i>Chalinolobus dwyeri</i>	Large-eared Pied Bat	E	E	TRUE	No	No known maternity roosts or Large-eared Pied Bat records occur within HLW Area, or within a 10 km radius. Foraging habitat has been assumed within 2 km of mapped potential karst and cliff lines due to survey limitations in the Revised BDAR, however HLW would not interfere with habitat occurring within 100 m of mapped potential karst and cliff lines. Potential indirect impacts associated with powerline collisions will be mitigated through bird deterrent devices per Annexure F Connectivity Strategy of the HLW BMP. Potential indirect impacts to this species also include noise and vibration through potential blasting and/or crushing activities. Noise and vibration assessment for crushing and blasting will occur for this species prior to such activities (refer Section 4.1). This includes the provision of buffer/exclusion zone if roosts are identified. As such, additional monitoring for this species has been excluded at this time. If additional roosts are identified, this monitoring program will be reviewed/updated per Section 2.1.
<i>Crinia sloanei</i>	Sloane's Froglet	E	E	False	Yes	Sloane's Froglet has been assumed present adjacent to disturbance zones. This species may be indirectly impacted by potential impacts through waterway crossings of streams. As such, this species has been included in monitoring in accordance with UMM B8.

Scientific Name	Common Name	BC Act Status	EPBC Act Status	SAII?	Included in program?	Justification
<i>Cyclodomorphus praealtus</i>	Alpine She-oak Skink	E	E	False	No	Alpine She-oak Skink has been assumed present adjacent to disturbance zones due to limitations associated with survey feasibility. It has a relatively small home range and is confined to native grassland or heath habitats within a narrow altitudinal range. Based on consultation with NSW DCCEEW (documented in the Revised BDAR), the species is unlikely to occur west of Maragle at elevations less than 1200 m elevation. Given this, HLW Area is considered outside of the known range of the species. Indirect/prescribed impacts to species are considered highly unlikely in the Revised BDAR, therefore this species has been excluded from monitoring.
<i>Delma impar</i>	Striped Legless Lizard	V	V	False	No	Striped Legless Lizard has been assumed present adjacent to disturbance zones. Habitat surveys will be undertaken for this species as part of the pre-clearing process. Indirect impacts associated with this species will be managed through the provision of Annexure F: Connectivity Strategy to maintain connectivity corridors for this species, which will also undergo monitoring. This species occurs in widespread habitats (open grassy and rocky areas) which will be retained throughout the ECZ, HTZ and surrounding areas. Therefore, indirect impacts are expected to have negligible effects on a potential population of Striped Legless Lizard and this species has been excluded from further monitoring.

Scientific Name	Common Name	BC Act Status	EPBC Act Status	SAII?	Included in program?	Justification
<i>Haliaeetus leucogaster</i>	White-bellied Sea Eagle	V	MAR	False	No	White-bellied Sea Eagle has been assumed present adjacent to disturbance zones. Potential indirect impacts associated with collision risk will be mitigated through bird deterrent devices per Annexure F: Connectivity Strategy and stick nest dismantlement per Annexure C: Hollow and Nest Strategy of the HLW BMP. Threatened fauna breeding habitat surveys will be undertaken for this species as part of the pre-clearing process. This includes the provision of buffer/exclusion zone if nest trees are identified. Potential indirect impacts to this species also include noise and vibration through potential blasting and/or crushing activities. Noise and vibration assessment for crushing and blasting will occur for this species prior to such activities. Given the prioritised dismantling of stick nests within proximity to disturbance zones (to minimise collision risk and risk to assets), this species has been excluded from further monitoring.

Scientific Name	Common Name	BC Act Status	EPBC Act Status	SAII?	Included in program?	Justification
<i>Hieraaetus morphnoides</i>	Little Eagle	V	-	False	No	Little Eagle has been assumed present adjacent to disturbance zones. Potential indirect impacts associated with collision risk will be mitigated through bird deterrent devices per Annexure F: Connectivity Strategy and stick nest dismantlement per Annexure C: Hollow and Nest Strategy of the HLW BMP. Threatened fauna breeding habitat surveys will be undertaken for this species as part of the pre-clearing process. This includes the provision of buffer/exclusion zone if nest trees are identified. Potential indirect impacts to this species also include noise and vibration through potential blasting and/or crushing activities. Noise and vibration assessment for crushing and blasting will occur for this species prior to such activities. Given the prioritised dismantling of stick nests within proximity to disturbance zones (to minimise collision risk and risk to assets), this species has been excluded from further monitoring.
<i>Keyacris scurra</i>	Key's Matchstick Grasshopper	E	E	False	No	Key's Matchstick Grasshopper has been assumed adjacent to disturbance zones via expert report. Indirect impacts associated with this species will be managed through the provision of Annexure F: Connectivity Strategy to maintain connectivity corridors for this species & Annexure G Rehabilitation Plan to rehabilitate temporarily impacted habitat for this species; each of which contain monitoring programs (Section 4.1). This species occurs in grassland and grassy woodland which is widespread throughout the HLW Area. Therefore, this species has been excluded from additional monitoring.

Scientific Name	Common Name	BC Act Status	EPBC Act Status	SAII?	Included in program?	Justification
<i>Litoria booroolongensis</i>	Booroolong Frog	E	E	False	Yes	Booroolong Frog has been assumed present adjacent to disturbance zones. This species may be indirectly impacted by potential impacts through waterway crossings of streams. As such, this species has been included in monitoring in accordance with UMM B8.
<i>Litoria castanea</i>	Yellow-spotted Tree Frog	CE	E	TRUE	Yes	Yellow-spotted Tree Frog has been assumed present adjacent to disturbance zones. This species may be indirectly impacted by potential impacts through waterway crossings of streams. As such, this species has been included in monitoring in accordance with UMM B8.
<i>Lophoictinia isura</i>	Square-tailed Kite	V	-	False	No	Square-tailed Kite has been assumed present adjacent to disturbance zones. Potential indirect impacts associated with collision risk will be mitigated through bird deterrent devices per Annexure F: Connectivity Strategy and stick nest dismantlement per Annexure C: Hollow and Nest Strategy of the HLW BMP. Threatened fauna breeding habitat surveys will be undertaken for this species as part of the pre-clearing process. This includes the provision of buffer/exclusion zone if nest trees are identified. Potential indirect impacts to this species also include noise and vibration through potential blasting and/or crushing activities. Noise and vibration assessment for crushing and blasting will occur for this species prior to such activities. Given the prioritised dismantling of stick nests within proximity to disturbance zones (to minimise collision risk and risk to assets), this species has been excluded from further monitoring.

Scientific Name	Common Name	BC Act Status	EPBC Act Status	SAII?	Included in program?	Justification
<i>Mastacomys fuscus</i>	Broad-toothed Rat	V	V	False	No	Broad-toothed Rat has been assumed present adjacent to disturbance zones. Targeted surveys will be undertaken for this species as part of the pre-clearing process, including provisions for buffer/exclusion zone if individuals are identified. Indirect impacts associated with this species will be managed through the provision of Annexure F: Connectivity Strategy to maintain connectivity corridors, which contains monitoring of such provisions. This species occurs in wet alpine and subalpine heaths and woodlands which are widespread throughout the HLW Area. Therefore, this species has been excluded from additional monitoring.
<i>Myotis macropus</i>	Southern Myotis	V	-	False	No	Southern Myotis has been recorded adjacent to disturbance zones. It relies on waterways for all stages of its lifecycle (including breeding, roosting, and foraging). Per the Revised BDAR, no direct impacts are expected to aquatic values that would in turn impact reliant terrestrial habitat for this species, with prescribed impacts associated with water quality, waterbodies and hydrological processes considered negligent. Potential indirect impacts associated with powerline collisions will be mitigated through bird deterrent devices per Annexure F Connectivity Strategy of the HLW BMP. Potential indirect impacts to this species also include noise and vibration through potential blasting and/or crushing activities. Noise and vibration assessment for crushing and blasting will occur for this species prior to such activities (refer Section 4.1). This includes the provision of buffer/exclusion zone if roosts are identified. As such, additional monitoring for this species has been excluded at this time. If additional roosts are identified, this monitoring program will be reviewed/updated per Section 2.1.

Scientific Name	Common Name	BC Act Status	EPBC Act Status	SAII?	Included in program?	Justification
<i>Ninox connivens</i>	Barking Owl	V	-	False	Yes	Barking Owl has been assumed present adjacent to disturbance zones. Potential indirect impacts associated with collision risk will be mitigated through bird deterrent devices per Annexure F: Connectivity Strategy. Threatened fauna breeding habitat surveys will be undertaken for this species as part of the pre-clearing process. This includes the provision of buffer/exclusion zone if nest trees are identified. Potential indirect impacts to this species also include noise and vibration through potential blasting and/or crushing activities. Noise and vibration assessment for crushing and blasting will occur for this species prior to such activities. Ongoing monitoring of specialist breeding habitat has also been included as part of this monitoring program, however no monitoring sites are prescribed as this species is currently assumed present. If pre-clearing surveys or biodiversity verification reporting identify this species within 100 m of disturbance zones, monitoring will occur in those locations.

Scientific Name	Common Name	BC Act Status	EPBC Act Status	SAII?	Included in program?	Justification
<i>Ninox strenua</i>	Powerful Owl	V	-	False	Yes	Powerful Owl has been assumed present adjacent to disturbance zones. Potential indirect impacts associated with collision risk will be mitigated through bird deterrent devices per Annexure F: Connectivity Strategy. Threatened fauna breeding habitat surveys will be undertaken for this species as part of the pre-clearing process. This includes the provision of buffer/exclusion zone if nest trees are identified. Potential indirect impacts to this species also include noise and vibration through potential blasting and/or crushing activities. Noise and vibration assessment for crushing and blasting will occur for this species prior to such activities. Ongoing monitoring of specialist breeding habitat has also been included as part of this monitoring program, however no monitoring sites are prescribed as this species is currently assumed present. If pre-clearing surveys or biodiversity verification reporting identify this species within 100 m of disturbance zones, monitoring will occur in those locations.
<i>Petauroides volans</i>	Greater Glider	E	E	False	No	Greater Glider has been identified adjacent to disturbance zones. Potential indirect impacts associated with connectivity will be mitigated through Glider Crossing Zones per Annexure F: Connectivity Strategy of the HLW BMP, including associated baseline monitoring and ongoing monitoring (Section 4.1. Threatened fauna breeding habitat surveys will also be undertaken for this species as a part of the pre-clearing process, including the provision of buffer/exclusion zones if nest trees are identified. Therefore, this species has been excluded from additional monitoring.

Scientific Name	Common Name	BC Act Status	EPBC Act Status	SAII?	Included in program?	Justification
<i>Petaurus norfolcensis</i>	Squirrel Glider	V	-	False	No	Squirrel Glider has been identified in the ECZ, HTZ and adjacent to disturbance zones. Potential indirect impacts associated with connectivity will be mitigated through Glider Crossing Zones per Annexure F: Connectivity Strategy of the HLW BMP, including associated baseline monitoring and ongoing monitoring (Section 4.1). Threatened fauna breeding habitat surveys will also be undertaken for this species as a part of the pre-clearing process, including the provision of buffer/exclusion zones if nest trees are identified. Therefore, this species has been excluded from additional monitoring.
<i>Petroica rodinogaster</i>	Pink Robin	V	MAR	False	No	The Pink Robin is assumed present adjacent to disturbance zones. Threatened fauna breeding habitat surveys will be undertaken for this species as part of the pre-clearing process. This includes the provision of buffer/exclusion zone if nest trees are identified. This species inhabits rainforest and tall, open eucalypt forest, forming nests in trees. Widespread suitable habitat will be retained over a variety of PCTs within and surrounding the HLW Area. Indirect impacts to connectivity will be mitigated and monitored for through Connectivity Corridors per Annexure F Connectivity Strategy of the HLW BMP. Therefore, indirect impacts are expected to have negligible effects on a potential population of Pink Robin and this species has been excluded from further monitoring.

Scientific Name	Common Name	BC Act Status	EPBC Act Status	SAII?	Included in program?	Justification
<i>Phascogale tapoatafa</i>	Brush-tailed Phascogale	V	-	False	No	Brush-tailed Phascogale has been assumed present adjacent to disturbance zones. Threatened fauna breeding habitat surveys will be undertaken for this species as part of the pre-clearing process. This includes the provision of buffer/exclusion zone if nest trees are identified. Indirect impacts associated with this species will be managed through the provision of Annexure C: Hollow and Nest Strategy to replace impacted hollows, as well as Annexure F: Connectivity Strategy to maintain connectivity corridors; each of which contains monitoring of such provisions. This species occurs in dry sclerophyll open forest, nest/shelter in small hollows (2.5-4 cm wide) and use many different hollows over a short time span. Such habitats are widespread throughout the HLW Area and surrounds. Therefore, this species has been excluded from additional monitoring.
<i>Phascolarctos cinereus</i>	Koala	E	E	False	No	The Koala was assumed present adjacent to disturbance zones based on the high number of local records and the occurrence of Koala feed tree species. Indirect impacts associated with this species will be managed through the provision of Annexure F: Connectivity Strategy to maintain connectivity corridors, which contains monitoring of such provisions (refer Section 4.1). Widespread suitable habitat will be retained over a variety of PCTs within and surrounding the HLW Area. As such, this species has been excluded from monitoring.

Scientific Name	Common Name	BC Act Status	EPBC Act Status	SAII?	Included in program?	Justification
<i>Polytelis swainsonii</i>	Superb Parrot	V	V	False	Yes	The Superb Parrot is assumed present adjacent to disturbance zones. Threatened fauna breeding habitat surveys will be undertaken for this species as part of the pre-clearing process. This includes the provision of buffer/exclusion zone if nest trees are identified. Potential indirect impacts to this species also include noise and vibration through potential blasting and/or crushing activities. Noise and vibration assessment for crushing and blasting will occur for this species prior to such activities. Ongoing monitoring of specialist breeding habitat has also been included as part of this monitoring program, however no monitoring sites are prescribed as this species is currently assumed present. If pre-clearing surveys or biodiversity verification reporting identify this species within 100 m of disturbance zones, monitoring will occur in those locations.
<i>Pseudomys fumeus</i>	Smoky Mouse	CE	E	TRUE	No	Smoky Mouse has been assumed present adjacent to disturbance zones. Targeted surveys will be undertaken for this species as part of the pre-clearing process, including provisions for buffer/exclusion zone if individuals are identified. Indirect impacts associated with this species will be managed through the provision of Annexure F: Connectivity Strategy to maintain connectivity corridors, which contains monitoring of such provisions. This species occurs in sclerophyll forest, heathland and open-forest, nesting in burrows, which are widespread throughout the HLW Area. Therefore, this species has been excluded from additional monitoring.

Scientific Name	Common Name	BC Act Status	EPBC Act Status	SAII?	Included in program?	Justification
<i>Tyto novaehollandiae</i>	Masked Owl	V	-	False	Yes	Masked Owl has been assumed present adjacent to disturbance zones via expert report. Potential indirect impacts associated with collision risk will be mitigated through bird deterrent devices per Annexure F: Connectivity Strategy. Threatened fauna breeding habitat surveys will be undertaken for this species as part of the pre-clearing process. This includes the provision of buffer/exclusion zone if nest trees are identified. Potential indirect impacts to this species also include noise and vibration through potential blasting and/or crushing activities. Noise and vibration assessment for crushing and blasting will occur for this species prior to such activities. Ongoing monitoring of specialist breeding habitat has also been included as part of this monitoring program, however no monitoring sites are prescribed as this species is currently assumed present. If pre-clearing surveys or biodiversity verification reporting identify this species within 100 m of disturbance zones, monitoring will occur in those locations.

Scientific Name	Common Name	BC Act Status	EPBC Act Status	SAII?	Included in program?	Justification
<i>Tyto tenebricosa</i>	Sooty Owl	V	-	TRUE	Yes	Sooty Owl has been assumed present adjacent to disturbance zones via expert report. Potential indirect impacts associated with collision risk will be mitigated through bird deterrent devices per Annexure F: Connectivity Strategy. Threatened fauna breeding habitat surveys will be undertaken for this species as part of the pre-clearing process. This includes the provision of buffer/exclusion zone if nest trees are identified. Potential indirect impacts to this species also include noise and vibration through potential blasting and/or crushing activities. Noise and vibration assessment for crushing and blasting will occur for this species prior to such activities. Ongoing monitoring of specialist breeding habitat has also been included as part of this monitoring program, however no monitoring sites are prescribed as this species is currently assumed present. If pre-clearing surveys or biodiversity verification reporting identify this species within 100 m of disturbance zones, monitoring will occur in those locations.

V = Vulnerable; E = Endangered; CE = Critically Endangered; - = not listed

3.2.3. Threatened Ecological Communities

Monitoring of Threatened Ecological Communities (TECs) aims to detect and manage indirect construction-related impacts such as dust deposition, altered hydrology, edge effects, weed incursion, trampling or erosion. Three BC Act listed and two EPBC Act listed TECs were identified within the HLW Area. Table 3-3 provides an overview of these TECs, including justification for their inclusion/exclusion for monitoring as part of this program.

Table 3-3 Justification for TECs to be monitored

TEC Name	BC Act Status	EPBC Act Status	SAII?	Included in program?	Justification
Montane Peatlands and Swamps / Alpine Sphagnum Bogs and Associated Fens	EEC	EEC	False	Yes	Plant Community Type 637 is associated with this TEC. It will be protected from indirect and prescribed impacts through no-go zones per the HLW BMP, including a 30 m buffer from mapped locations. To ensure the no-go zones are protecting this TEC, it has been included in monitoring.
Tableland Basalt Forest in the Sydney Basin and South Eastern Highlands Bioregions	EEC	-	TRUE	No	This TEC is associated with parts of PCT 953. A total of 0.66 ha is proposed for impact, comprising 0.50 for partial impacts (ECZ) and only 0.16 for complete clearing (Total Clearing Zone [TCZ]). 2.62 ha occurs outside of the disturbance zones, with more expected in the landscape, all of which will be protected through clearing limits. Other indirect impacts will be mitigated through the BMP (connectivity corridors, erosion and sediment controls, rehabilitation and monitoring of temporary disturbance sites, biosecurity protocols including weed and pathogen monitoring). Prescribed impacts associated with water quality, waterways, and hydrological processes on this TEC were determined unlikely in the Revised BDAR. As such, further monitoring has been excluded for this TEC.

TEC Name	BC Act Status	EPBC Act Status	SAII?	Included in program?	Justification
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	CEEC	CEEC	TRUE	No	75.64 ha of this TEC is proposed for impact, comprising 9.32 for partial impacts (ECZ & HTZ) and only 66.32 for complete clearing (TCZ). Over 520 ha occurs outside of disturbance zones, with significance occurrence in the landscape, all of which will be protected through clearing limits. Other indirect impacts will be mitigated through the BMP (connectivity corridors, erosion and sediment controls, rehabilitation and monitoring of temporary disturbance sites, biosecurity protocols including weed and pathogen monitoring). Given its widespread occurrence and existing disturbance in the landscape, further monitoring has been excluded for this TEC.

EEC = Endangered Ecological Community; CEEC = Critically Endangered Ecological Community; - = not listed

3.2.4. Partial clearing zones

This program also includes progressive monitoring of partial clearing zones per MCoA B30(d)(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.

To minimise impacts on biodiversity, where practicable, Transgrid have opted to include a partial clearing methodology, thereby retaining vegetation beneath the easement during the operational maintenance phase of the amended project (i.e., Transgrid are not adopting full continuous clearance of the easement, which is the 'easier' maintenance option). Partial clearing defined in Table 13-1 of the Revised BDAR as the Easement Clearing Zone (ECZ) and Hazard Tree Zone (HTZ).

The ECZ includes land within the proposed transmission line easement where clearing and ongoing maintenance of tall growing vegetation would be undertaken. Earthworks and grubbing are not required within this zone except in limited circumstances.

The HTZ includes land located adjacent to the transmission line easement where selective tree removal, trimming or lopping would be undertaken to manage any risk of damage to transmission lines and structures in the event of tree fall. Earthworks and grubbing are not required within this zone except in limited circumstances.

The assumptions in the BDAR of the partial clearing in the ECZ include:

- All trees in ECZ polygons need to be removed regardless of height.
- Shrubs will be avoided to the extent possible, but the majority of clearing will be completed using machinery and there will likely be collateral impact on the existing shrub layer due to movement of machinery on site, as well as felling and removal of felled tree branches/barrels.
- Clearing will use of machinery that maximises vegetation clearance coverage/reach.
- Clearing will use machinery and tracks that minimises ground impacts.
- Machinery access paths will be consolidated/minimised.
- Machinery access will be restricted within ecologically sensitive areas (e.g., wetlands and bogs).
- Non-lethal methods of temporary vegetation removal (e.g., mulching/slashing, cutting) will be used that would allow native vegetation to re-grow.
- Where lethal vegetation control is used this would be targeted to avoid damage/death of non-target individuals (e.g., cut-stump painting of cleared woody individuals, rather than foliar spray applications).
- Hand clearing / felling will occur in areas that are not safely or practicably accessible for machine clearing.
- Hand clearing/felling may also be used in the immediate vicinity of areas of very high ecological sensitivity identified in the constraints mapping to minimise the potential for impacts. Fencing will be used to demarcate these areas.
- Felled trees will be tub ground to provide material for erosion/sediment control and rehabilitation. Mulch may be evenly spread on bare disturbed areas to assist with the protection of the soil. Spread of mulched material to a depth of >50 mm will be avoided where practicable.
- Logs may be placed on the edge of the easement in select areas where they will not impede easement access for maintenance.
- For conductor stringing purposes, all remaining shrubs within a 10-metre-wide area along the centre of the easement would need to be tied down or slashed to prevent snagging of the

conductor.

- In areas where mature trees can be retained on easement (e.g., valleys), a stringing methodology that does not require vegetation disturbance would be used.

3.3. Structure

The species/areas that will be targeted for monitoring during construction have been grouped by shared objectives and methods, as summarised in Table 3-4 below.

Table 3-4 Grouping of monitored entities

Monitoring group	Target entities
Artificial hollow monitoring Section 4.1.1	• Brown Treecreeper (eastern subspecies; <i>Climacteris picumnus victoriae</i>). • Little Lorikeet (<i>Glossopsitta pusilla</i>). • Purple-crowned Lorikeet (<i>Glossopsitta porphyrocephala</i>). • Brush-tailed Phascogale (<i>Phascogale tapoatafa</i>). • Corben's Long-eared Bat (<i>Nyctophilus corbeni</i>). • Eastern False Pipistrelle (<i>Falsistrellus tasmaniensis</i>). • Eastern Coastal Free-tailed Bat (<i>Micronomus norfolkensis</i>). • Eastern Pygmy-possum (<i>Cercartetus nanus</i>). • Greater Broad-nosed Bat (<i>Scoteanax rueppellii</i>). • Little Pied Bat (<i>Chalinolobus picatus</i>). • Southern Myotis (<i>Myotis macropus</i>). • Yellow-bellied Sheath-tail-bat (<i>Saccolaimus flaviventris</i>). • Superb Parrot (<i>Polytelis swainsonii</i>). • Turquoise Parrot (<i>Neophema pulchella</i>). • Squirrel Glider (<i>Petaurus norfolkensis</i>). • Gang-gang Cockatoo (<i>Callocephalon fimbriatum</i>). • Glossy Black-Cockatoo (<i>Calyptorhynchus lathami lathami</i>). • Spotted-tailed Quoll (<i>Dasyurus maculatus</i>). • Southern Greater Glider (<i>Petauroides volans</i>). • Yellow-bellied Glider (<i>Petaurus australis</i>). • Barking Owl (<i>Ninox connivens</i>). • Powerful Owl (<i>Ninox strenua</i>). • Masked Owl (<i>Tyto novaehollandiae</i>). • Sooty Owl (<i>Tyto tenebricosa</i>).
Weed and pathogen monitoring Section 4.1.2	All flora and ecological communities.

Monitoring group	Target entities
Connectivity corridor monitoring Section 4.1.3	• Eastern False Pipistrelle. • Southern Myotis. • Large-eared Pied Bat. • Broad-toothed Rat. • Brush-tailed Phascogale. • Smoky Mouse. • Koala. • Eastern Pygmy-possum. • Southern Greater Glider. • Yellow-bellied Glider. • Squirrel Glider. • Flame Robin. • Scarlet Robin. • Pink Robin. • Varied Sittella. • Alpine She-oak Skink. • Pink-tailed Legless Lizard. • Striped Legless Lizard. • Sloane's Froglet. • Booroolong Frog. • Yellow-spotted Tree Frog. • Key's Matchstick Grasshopper.
Rehabilitation monitoring Section 4.1.4	• Key's Matchstick Grasshopper habitats. • PCT 266, 268, 277, 285, 287, 290, 297, 299, 300, 306, 319, 343, 352, 638, 679, 939, 953 and 1196. • Critically Endangered & entity at risk of Serious and Irreversible Impact (SAIL): White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland per BC Act & EPBC Act. • Endangered & SAIL: Tableland Basalt Forest in the Sydney Basin and South Eastern Highlands Bioregions per BC Act. • Endangered: Montane Peatlands and Swamps per BC Act & EPBC Act.
Partial clearing zone monitoring and clearing limit monitoring Section 4.2	All threatened species habitats, PCTs and TECs.

Monitoring group	Target entities
Threatened flora Section 4.3	• <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 pubescens</i>. • <i>Cullen parvum</i>. • <i>Diuris tricolor</i>. • <i>Glycine latrobeana</i>. • <i>Grevillea wilkinsonii</i>. • <i>Persoonia marginata</i>. • <i>Pimelea bracteata</i>. • <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>.
Threatened owls, cockatoos and parrots Section 4.4	• Barking Owl. • Powerful Owl. • Gang-gang Cockatoo. • Superb Parrot. • Masked Owl. • Sooty Owl. • South-eastern Glossy Black-Cockatoo.
Threatened frogs Section 4.5	• Booroolong Frog. • Sloane's Froglet. • Yellow-spotted Tree Frog.
TECs Section 4.6	Montane Peatlands and Swamps / Alpine Sphagnum Bogs and Associated Fens

4. Monitoring program

4.1. BMP monitoring

4.1.1. Artificial hollow monitoring

Artificial hollow monitoring is detailed in Table 4-1 below, with additional information provided in Annexure C: Hollow and Nest Strategy of the HLW BMP. Any long-term monitoring (post-construction) will be detailed within the Transgrid Operational Biodiversity Management Plan and should incorporate components of monitoring detailed herein for a minimum of 3-years post installation.

Table 4-1 Artificial hollow monitoring

Artificial Hollow Monitoring	
Objective and target	Ensure artificial hollow/replacement hollows provide suitable and functioning habitat for target fauna species and remain structurally sound through construction. Targets include: • 100% of hollows in working condition. • Increasing occupancy/use by target species. • No more than 10% invaded by pest species (e.g., myna, bees).
Location and sampling unit	All Hollow Replacement Zones, in accordance with Annexure C: Hollow and Nest Strategy of the HLW BMP. Each artificial hollow (including salvaged hollows) is considered an individual monitoring unit, as georeferenced and ID'd in the Nest Box Installation Report.
Method	Monitoring will be conducted by the Project Ecologist via endoscopic camera (or similar) attached to an extendable pole to minimise disturbance of resident fauna. The following will be recorded: • Name of observer. • Date. • Prevailing weather conditions. • Unique ID of the artificial hollow. • Artificial hollow type (i.e., nest box, salvaged or hollow hogs). • Assessment of artificial hollow and suspension system condition. • Host-tree health and stability. • Evidence of pest species. • Evidence of fauna use. • Photographic evidence of condition, fauna use and pest presence (if present).
Timing, effort and frequency	Biannually during construction (spring and autumn). Any long-term monitoring (post-construction) will be detailed within the Transgrid Operational Biodiversity Management Plan and should incorporate components of monitoring detailed herein for a minimum of 3-years post installation.

Artificial Hollow Monitoring

Data analysis

Occupancy trends:

- Track species-specific use over time to assess whether certain box types or placements are preferred.
- Compare against target species lists (Annexure C: Hollow and Nest Strategy).

Structural integrity assessment:

- Identify patterns of structural failure (e.g., weather, mount type, tree decay).
- Calculate integrity rate (%) per hollow type and guide replacements/adjustments.

Non-target use:

- Quantify invasive/non-target use and cross-reference with location and type.

Performance scoring:

- Develop a simple scoring system (e.g., 0-3 scale: failed, intact-unused, intact-used, target-occupied).

Species response indicators:

- Compare use across different Hollow Replacement Zones or vegetation types.

Reporting

Artificial Hollow Monitoring Reports will be prepared biannually, following monitoring detailed above. These will be provided to CPHR, FCNSW and DCCEE as soon as it is available. The report will include the following:

- Name of observer, survey dates and prevailing weather conditions.
- Maps of Hollow Replacement Zones and replacement hollows within.
- Summarise condition, use, fauna occupancy and issues for each hollow type.
- Include photographic evidence (internal and external).
- Tabulate percentage use, failure and presence of non-target species including pests.
- Maintain spatial register (excel) with status, ID and last inspection date for each replacement hollow.
- Assessment of incidents/non-compliances based on targets provided in this monitoring program.
- Recommendations on adaptive management (if required) as detailed below.

All Artificial Hollow Monitoring Reports will be summarised and collated in the annual BMP Monitoring Report as detailed in the HLW BMP, including all GIS data collected (GPX files, shapefiles).

Adaptive management

Artificial Hollow Monitoring

- Repair or replace any damaged artificial hollows (e.g., fallen, chewed, weathered).
- Reposition salvaged hollows if shifted or destabilized.
- Remove or exclude pest species (e.g., European Honeybees) or non-target species (e.g., Myna nests).
- Re-fasten suspension system or replace if degraded.
- Replace any artificial hollows lost or rendered unusable (targeting no net loss of installed hollows).
- Re-bore or repair hollow hogs showing signs of collapse or degradation.
- Prune or manage surrounding vegetation if access is impeded.

4.1.2. Weed and pathogen monitoring

Weed and pathogen monitoring is detailed in Table 4-2 below, with additional information provided in Annexure E: Biosecurity Management Plan of the HLW BMP.

Table 4-2 Weed and pathogen monitoring

Weed and Pathogen Monitoring
Objective and target Detect and control weed and pathogen spread resulting from construction activities, particularly into sensitive areas such as no-go zones, threatened species habitats, TECs and SALLs. Targets include: • No new weed species introduced. • No increase in weed cover or pathogen indicators beyond baseline levels.
Location and sampling unit Weed monitoring locations will be set at the following intervals of the alignment, with a sampling unit at each transect: • Every 250 m in: ◦ Stockpiles. ◦ Areas with known weed infestations (per pre-clearing baseline surveys). ◦ High-conservation values (e.g., no-go zones, TECs, SALL flora species polygons). ◦ Within rehabilitation zones per Annexure G Rehabilitation Plan of the HLW BMP. • Every 1,000 m in: ◦ Cleared or low-value grazing lands. Pathogen monitoring locations will be access points, vehicle washdown stations (to ensure that hygiene measures are effective) and compounds. Several small sub-samples will be collected at each location (minimum of 5 sub-samples), collected and combined into a single representative sample for that location.
Method

Weed and Pathogen Monitoring

Weeds:

Prior to the commencement of clearing, weeds will be mapped within the HLW Area during pre-clearing surveys by the Project Ecologist. Given the large area of impact associated with HLW, weed mapping may be undertaken on-foot, using drones or using binoculars to assess larger areas from a vantage point. The surveys will include the identification of weed species present, including density and location, and will include the physical demarcation of weed restricted areas. Results of baseline weed monitoring, particularly locations of weed restricted areas, will be used to confirm sensitive area maps and update HLW GIS.

Weed monitoring will continue annually during construction works by the Project Ecologist to determine weed cover for the HLW Area, inform the location and extent of controls and monitor cycles of weed growth and novel weed establishment. For the first monitoring event, it is necessary to install permanent markers (e.g., star picket marked/flagged with monitoring location name) and record the coordinates of each monitoring location in order to relocate for subsequent monitoring events. Methods will involve the line-point intercept method along a 100 m transect:

- At each interval, the cover of weed species will be measured, using a straight rod. Any intercepts or “hits” of a weed species on the rod will be recorded as present (with one being the upper limit for each stratum at each point). No intercepts of weed species at each stratum records a zero.
- As data is collected along each transect, the cover (%) of weeds for each stratum (exotic shrubs <1 m, exotic grasses and exotic ground cover) is calculated by dividing the number of hits by the number of transects, then multiplying it by 100.
- As data is collected along each transect, the cover (%) of each stratum of weeds is calculated by determining the average cover at each interval.

Pathogens:

A soil sampling program will be undertaken prior to construction by a suitably qualified person(s) to test for presence/absence of *Phytophthora* within the HLW Area. Several small sub-samples will be collected at each location (minimum of 5 sub-samples), collected and combined into a single representative sample for that location. The collection of each sub sample will involve:

- Use a sterile garden trowel to scrape away surface leaf litter.
- Dig a small hole, collect a small amount of soil and living plant roots (the hole does not need to be any deeper than 10 cm and you only need 100-250 grams of soil).
- Place combined samples into a new, thick zip-lock plastic bag.
- Label the bag with date, monitoring site code and sample number (e.g., 19/10/2025, AccomCamp1).
- Place into a second bag to prevent cross contamination and as a safeguard against breakage.
- Store soil samples in a cool, dark place and dispatch for analysis as practicable after sampling.
- After each sample, scrub your hands and the trowel thoroughly with methylated spirits to disinfect them and prevent cross-contamination of samples.
- Send samples to a suitable laboratory to analyse for *Phytophthora*. The samples are to be stored in temperatures below 24° C, and with ice bricks that do not directly have contact with the samples.

Timing, effort and frequency

Baseline prior to clearing at an area (during Pre-clearing Surveys), then annually during construction.

Weed and Pathogen Monitoring

Data analysis

Weed cover trends:

- Compare against baseline data to detect increases in weed richness or total % cover.
- Assess spatial correlation with disturbance types (e.g., stockpiles vs easement).

Species incursion mapping:

- Identify new weed species or spread of target weeds into sensitive zones.
- Analyse trends around washdown locations, vehicle access points and bare soil areas.

Pathogen presence/spread:

- Monitoring data (laboratory results) for each pathogen monitoring location is to be kept in a spreadsheet with additional results added after each monitoring period.

Reporting

Pre-clearing Reports will include results from baseline weed monitoring, including:

- Weed species identified, including locations (figures) and estimates of density.
- Recommended weed control measures based on confirmed weed species occurrence.
- Locations of weed restricted areas.

The annual BMP Monitoring Report will be prepared to document results of weed and pathogen monitoring, including:

- Details on the weed control actions undertaken since the last report, including;
 - A list of the control activities undertaken.
 - A map of areas where control activities were undertaken.
- A comparative analysis against baseline data.
- The efficacy of the control measures in relation to the objective of minimising weed and pathogen distribution and/or abundance in the HLW Area.
- Recommendations for future control activities.
- A summary of the efficacy of other control measures outlined in the Biosecurity Plan and recommendations for revisions to controls.

During construction, any biosecurity issues will be reported to Transgrid immediately.

Adaptive management

- Report new weed presence to Transgrid. Develop and implement weed management options to control new weeds. Investigate the source of weed spread and implement improvements to weed management measures. Transgrid will report any new weed presence to NSW DPI, if the species is a Prohibited Matter such as *Parthenium hysterophorus*.
- Report new *Phytophthora* presence to Transgrid. Develop and implement pathogen management options. Investigate the source of pathogen spread and implement improvements to pathogen management measures.
- Re-train workers on hygiene protocols. Review and implement pathogen management options.

4.1.3. Connectivity corridor monitoring

Connectivity corridor monitoring is detailed in Table 4-3 below, with additional information provided in Annexure F: Connectivity Strategy of the HLW BMP.

Table 4-3 Connectivity corridor monitoring

Connectivity Corridor Monitoring	
Objective and target	
Ensure connectivity corridors are established/retained during construction, remain ecologically functional and provide suitable movement pathways for target fauna species. Targets include: • Ground Corridors established and retained. • Vegetation and habitat features support fauna movements. • Glider poles installed at correct locations, heights and numbers. • Glider poles show evidence of use within 2 years.	
Location and sampling unit	
Monitoring locations will be established at each final Ground Corridor and Glider Crossing, with each corridor as a sampling unit.	
Method	
<u>Ground Corridors:</u> Qualitative assessments of habitat values by the Project Ecologist, including: • Type, condition, structure, density, continuity and extent of retained vegetation. • Score ground cover/shrub retention and linkage (visual continuity across the landscape). • Identify gaps or impediments within the corridor including clearing works, fragmentation from access tracks/roads, evidence of pest use, erosion scars. • Delineation of corridors. <u>Glider Crossings:</u> Terminating glider poles (one at each end of the Glider Crossing) will be fit with one motion detecting cameras during construction. Motion detecting cameras will be set to record 10 photos per motion trigger, with one second interval between images and a quiet period of 30 second between triggers, set to record continuously.	
Timing, effort and frequency	
Ground corridors = biannually each spring and autumn during construction. Glider Crossing = motion detecting cameras will be set to record continuously for the entire year, with data analysis to target three months of the year during the construction period, including the target Glider species breeding periods: • Greater Glider = March. • Squirrel Glider & Yellow-bellied Glider = September. Monitoring will continue for 5 years post-installation, to be incorporated into the Operational Biodiversity Management Plan by Transgrid.	

Connectivity Corridor Monitoring

Data analysis

Habitat value trends:

- Track % of each corridor that maintains suitable structure (>50% groundcover continuity).
- Score against baseline or predicted retention values from Revised BDAR.
- Identify newly emerging barriers (e.g., vehicle tracks, erosion, pests) that may impede movement.

Corridor functionality assessment:

- Cross-reference presence/absence data of Gliders with habitat structure.
- Determine corridor success rate (number of Glider Crossings with confirmed use over time).

Reporting

Biannual Connectivity Monitoring Reports will be prepared, including the following:

- Results of Ground Corridor monitoring.
- Results of Glider pole camera monitoring.
- Qualitative assessments of habitat values within Ground Corridors.
- Assessment of glider utilisation of glider poles.
- Assessment of the overall success of the mitigation measures installed.
- Identification of gaps/limitations to the connectivity 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.
- Details of any non-conformances, including recommended corrective measures.

Biannual Connectivity Monitoring Reports will be provided to CPHR, NPWS, FCNSW and DCCEEW as soon as they are available.

Adaptive management

- Rehabilitate native ground layer and shrubs, monitor regrowth and undertake pest/weed control as necessary within Ground Corridors.
- Review pole spacing and height, assess surrounding vegetation, conduct additional Glider surveys in areas subject to baseline Glider surveys to compare Glider activity in surrounding areas.
- Development of a mitigation plan in consultation with NSW DCCEEW Environment and Heritage, addressing causes of Glider decline as determined in initial investigation. This may include increased monitoring or additional construction related mitigation measures.
- If this is ineffective, additional offsets may be required.

4.1.4. Rehabilitation monitoring

Rehabilitation monitoring is detailed in Table 4-4 below, with additional information provided in Annexure G: Rehabilitation Plan of the HLW BMP.

Table 4-4 Rehabilitation monitoring

Connectivity Corridor Monitoring	
Objective and target	
Monitor the natural regeneration of native vegetation in temporary disturbance areas to ensure the return of a resilient, self-sustaining vegetation community. Targets include: • Maintain 85% survival rate of target seedlings in rehabilitated Key's Matchstick Grasshopper habitats. • Maintain a stable, non-eroding soil surface across rehabilitated temporary disturbance areas. • Re-establish ≥80% total groundcover of which ≥80% is native. • Facilitate recruitment of ≥5 native species, including at least 2 functional groups (e.g., grass, forb, shrub). • Maintain ≤10% cover of High Threat Weeds and ≤20% total weed cover. • Rehabilitated sites are stable and trending towards natural regeneration without further intervention.	
Location and sampling unit	
Indicative monitoring locations are provided in Figure 3-1 of Annexure G: Rehabilitation Plan, targeting the following minimum monitoring locations: • 1 monitoring location is required within the patch of rehabilitated KMG habitat. • 1 monitoring location is required at each accommodation camp/ancillary facility. • 1 monitoring location every 10 linear km of the alignment for all other temporary disturbance areas (i.e., brake and winch sites, rehabilitated temporary access tracks). Each monitoring location will serve as a sampling unit.	
Method	
Photo monitoring points will provide an indication of the success or failure of any areas of rehabilitation conducted. Plot-based monitoring must follow the methods outlined in the <i>Biodiversity Assessment Method</i> (BAM; DPIE 2020a). Established 20 m x 20 m plots (or 400 m² equivalent for linear areas) must be assessed with the information outlined below recorded.	
Growth form	Growth form for each recorded native species
Species name	Scientific name of each native and exotic species
Cover	Estimate the foliage cover of each native and exotic species within the boundaries of the plot including all attached plant material, alive or dead, rooted in or overhanging the plot. Cover should be recorded: • In decimals if less than 1% (e.g. 0.1, 0.2). • In whole numbers up to 5% (e.g. 1, 2, 3). To the nearest 5% if >5% cover (e.g. 5, 10, 15, 20, 25).

Connectivity Corridor Monitoring

Abundance rating	Count (when ≤ 10) or estimate (when > 10) the number of individuals of each native and exotic species rooted within the plot. Record abundance as: • Counts of 1, 2, 3... • Estimates of 10, 20, 30... • 100, 200, 300... • 1000, 2000, 3000.
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Erosion	Visual assessment of soil stability; record presence/absence and dimensions (length $\times$ width $\times$ depth) of: • Rills or gullies. • Exposed subsoil. • Sediment plumes downslope.
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Timing, effort and frequency

Monitoring will be completed by the Project Ecologist annually (spring) during construction works. Any longer-term monitoring (post-construction) would be detailed within the Transgrid Operational Environmental Management Plan and should incorporate components of monitoring detailed herein.

Data analysis

Trend analysis:

- Evaluate improvements or decline in vegetation metrics over time.
- Use scoring matrix (e.g., 0 = no regrowth, 1 = partial cover, 2 = full cover) for rapid visualisation.
- Compare abundance and cover of native/exotic species against targets listed in Revised BDAR.

Success rate evaluation:

- % plots meeting all target thresholds within specified timeframe.

Weed pressure mapping:

- Identify high weed infestation areas for early control or further rehabilitation efforts.

Correlation analysis:

- Compare vegetation recovery to original vegetation zone, soil quality or location to prioritise adaptive management.

Reporting

Following the completion of monitoring, all data will be collated and presented within the annual BMP Monitoring Report. The report will include the following:

- Details of monitoring methods.
- Assessment of rehabilitation success by annual plot data and reporting, with reference to targets provided above. Photographic evidence of condition by photo points.
- Comparison of annual monitoring with previous year (if construction monitoring extends 2-years), as well as Revised BDAR data.
- Assessment of incidents and non-compliances.
- Recommendations for future rehabilitation and/or corrective efforts (if necessary).
- If for any reason rehabilitation cannot be achieved as per the Rehabilitation Plan, evidence will be supplied and reasoning detailed within.

Connectivity Corridor Monitoring

Adaptive management

- Implement supplementary seeding.
- Increase frequency of weed control per Annexure E: Biosecurity Plan of the HLW BMP.
- Reassess weed source pathways (e.g., vehicles, stockpiles) and address any barriers
- Install/repair erosion controls (e.g., jute matting, coir logs).
- Regrade of contour site to slow runoff.
- Reapply topsoil or mulch as needed.
- Infill with native mulch or topsoil.
- Targeted seeding with native grasses and forbs.
- Evaluate seedbank condition.
- Targeted seeding with native species.
- Implement secondary rehabilitation (e.g., deep ripping, re-mulching, seeding).
- Consider active revegetation.
- Extend monitoring and maintenance timeline.

4.2. Partial clearing zone monitoring

In line with CoA B30(d)(viii), partial clearing areas will be progressively monitored to confirm the assumptions made in the Revised 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 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.

4.2.1. 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:
 - o Total clearance.
 - o Partial clearance.
 - o 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 <1 m 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 for the following:

- 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 the following, must be submitted to Transgrid and CPHR as part of the quarterly verification report:

- Maps showing all areas cleared within the reporting period, and
- A reconciliation table comparing the clearing footprint to the current approved clearing limits.

4.2.2. Vegetation condition assessment

The vegetation condition assessment component of the progressive partial clearing monitoring is intended to verify key Revised 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 Revised BDAR assumptions.

Assessments will be carried out using vegetation integrity survey plot methods outlined in the *Biodiversity Assessment Method 2020* (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 is summaries in Table 4-5, with indicative monitoring locations displayed in Figure 4-1. Each vegetation plot must be paired to a control plot located within adjoining, non-impacted areas of the same PCT and condition class. Control plots will be assessed as the same time (within days) of the impact plots.

Photographic monitoring points (refer Section 4.2.3) must be established in PCTs that are less than 0.5 ha and therefore do not have any vegetation plot monitoring.

Table 4-5 Minimum number of plots required per vegetation class and zone

Vegetation class	PCT ID	Vegetation zone	Area (ha)	Plots per vegetation class	Plots per vegetation zone
Inland Riverine Forests			1.68	1	
	5	Moderate	1.68		1
Inland Rocky Hill Woodlands			0.08	0	

Vegetation class	PCT ID	Vegetation zone	Area (ha)	Plots per vegetation class	Plots per vegetation zone
	319	Moderate	0.07		0
		Low	0.01		0
Montane Bogs and Fens			0.53	1	
	939	High	0.53		1
Montane Wet Sclerophyll Forests			34.50	12	
	638	High	25.88		9
		Moderate	7.60		3
		Low	0.88		0
		Very low	0.14		0
Southern Tableland Dry Sclerophyll Forests			62.01	21	
	299	Moderate	10.74		4
		Low	0.15		0
		Very low	1.03		0
	352	Very low	0.14		0
	953	Very high	20.97		7
		High	18.56		7
		Moderate	6.62		3
		Low	3.80		0
Southern Tableland Grassy Woodlands			0.43	0	
	731	Low	0.35		0
		Very low	0.08		0
Southern Tableland Wet Sclerophyll Forests			11.26	4	
	300	Very high	9.52		3
		Moderate	1.35		1

Vegetation class	PCT ID	Vegetation zone	Area (ha)	Plots per vegetation class	Plots per vegetation zone
		Low	0.40		0
Subalpine Woodlands			25.20	9	
	679	High	2.27		1
		Low	0.05		0
	1196	High	21.78		8
		Low	1.09		0
Upper Riverina Dry Sclerophyll Forests			11.01	4	
	285	Very high	0.37		0
		High	3.54		3
		Low	4.09		0
	290	High	1.56		1
		Moderate	0.21		0
		Low	0.08		0
		Very low	0.13		0
	297	Moderate	0.49		0
		Low	0.08		0
		Very low	0.10		0
	306	Low	0.15		0
		Very low	0.04		0
	314	Very high	0.18		0
Western Slopes Dry Sclerophyll Forests			4.17	2	
	287	Very high	2.28		1
		Moderate	0.80		0
		Very low	0.03		0

Vegetation class	PCT ID	Vegetation zone	Area (ha)	Plots per vegetation class	Plots per vegetation zone
	343	Moderate	0.83		1
		Low	0.10		0
		Very low	0.13		0
Western Slopes Grassy Woodlands			17.65	6	
	266	Moderate	1.48		1
		Low	2.01		0
	268	Very high	1.76		1
		Low	0.27		0
	277	High	4.15		3
		Low	3.55		0
		Very low	2.35		0
	278	High	1.05		1
	280	Low	0.12		0
		Very low	0.92		0
Grand total			168.53	60	60

4.2.3. 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. 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 BAM.

At non-vegetation integrity plot sites, including PCTs with <0.5 ha of partial clearing, photographic monitoring will occur at fixed georeferenced locations with the orientation recorded to allow for repeat monitoring. Photographic monitoring must use consistent photo points (i.e., tripod/star picket, set height, nominated bearing) to obtain qualitative/visual data showing retention of vegetation condition and height (~200 mm) across the ECZ/HTZ.

4.2.4. 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. The report will

be prepared by a person accredited to apply the BAM.

The report will confirm partial clearance has been undertaken in accordance with procedures identified in Annexure B: Clearing Protocol. The report will also provide the results of any partial clearance monitoring undertaken during the reporting period in accordance with Table 4-6 to confirm the assumptions made in the Revised 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 HLW BMP, this Biodiversity Monitoring Program, or Annexure B: Clearing Protocol.

The following information is to be collected and compiled within each report:

Part A: Clearing limit tracking:

- Table of the HLW construction clearing limits with comparison to the extent of clearing completed.
- Forecast for clearing of each PCT and threatened species habitat.

Part B: Partial Clearing Monitoring:

- Description of areas subject to partial clearance to date, including area (m²) of each PCT partially cleared.
- The name of contributors to the report and the BAM Accredited Assessor responsible for the results.
- Date(s).
- Weather conditions.
- VI scores for each paired plot by applying s4.3.3 of the BAM for assessing vegetation integrity (VI plot survey), including provision of field data sheets.
- Photographic monitoring images compared with previous and baseline images.
- Any other disturbance observed within partial clearance monitoring areas.
- Assessment against the targets in Table 4-6.
- Recommendations for any additional actions required.

Reports will be provided to Transgrid within 6 weeks of the end of each reporting period.

4.2.5. Monitoring procedure

Clearing limit and partial clearing monitoring is summarised in Table 4-6 below.

Table 4-6 Clearing limit and partial clearing monitoring

Clearing Limit and Partial Clearing Monitoring
Objective and target
The following objectives relate to partial clearing monitoring: - Track the extent (hectares) of partial and total clearing 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. Overall, vegetation performance will be assessed against the following targets: - Consistent visual condition of each PCT compared to the baseline monitoring sessions and baseline data. - Consistent VI scores compared to control plots (<10% difference).
Location
<u>Tracking of clearing limits:</u> - All areas where clearing has occurred. <u>Vegetation condition monitoring:</u> - Point location of proposed partial clearing zone (impact) and reference (control) monitoring points per Table 4-5. Indicative locations are shown in Figure 4-1. <u>Photographic monitoring:</u> - Point location of proposed partial clearing zone (impact) and reference (control) monitoring points. - Point location of proposed photographic monitoring points in vegetation zones <0.5 ha.
Method

Clearing Limit and Partial Clearing Monitoring

Tracking of clearing limits:

- Georeferenced drone imagery (or equivalent) with a spatial accuracy <1 m must be used to verify the clearing.

Vegetation condition monitoring:

- Assessments will be carried out using vegetation integrity survey plot methods outlined in the BAM. 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.

Photographic monitoring:

- 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.
- BAM plot photos in conjunction with vegetation condition monitoring.
- At non-vegetation integrity plot sites, photographic monitoring will continue at baseline photo monitoring points.

Timing, effort and frequency

Tracking of clearing limits:

- Within 3 months of clearing in the monitoring area then quarterly for the duration of construction.

Vegetation condition monitoring:

- Within 3 months of clearing in the monitoring area then biannually at each monitoring site for the duration of construction.

Photographic monitoring:

- Within 3 months of clearing in the monitoring area then biannually at each monitoring site for the duration of construction.

Data analysis

Tracking of clearing limits:

- 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 CPHR from the Revised BDAR or subsequent Condition 29 Biodiversity Assessment Verification Report.

Vegetation condition monitoring:

- Comparison of VI Score, composition and structure scores for grass and forb growth forms and leaf litter for each paired plot.

Photographic monitoring:

- The visual condition of PCTs is to be directly compared to the baseline photographic monitoring session and all previous photographic monitoring session(s).

Clearing Limit and Partial Clearing Monitoring

Reporting

Partial Clearing Validation Report (PCVR) will be prepared quarterly by an appropriately experienced ecologist accredited under the BAM. The following information is to be collected and compiled within each report:

Part A: Clearing limit tracking:

- Table of the HLW construction clearing limits with comparison to the extent of clearing completed.
- Forecast for clearing of each PCT and threatened species habitat.

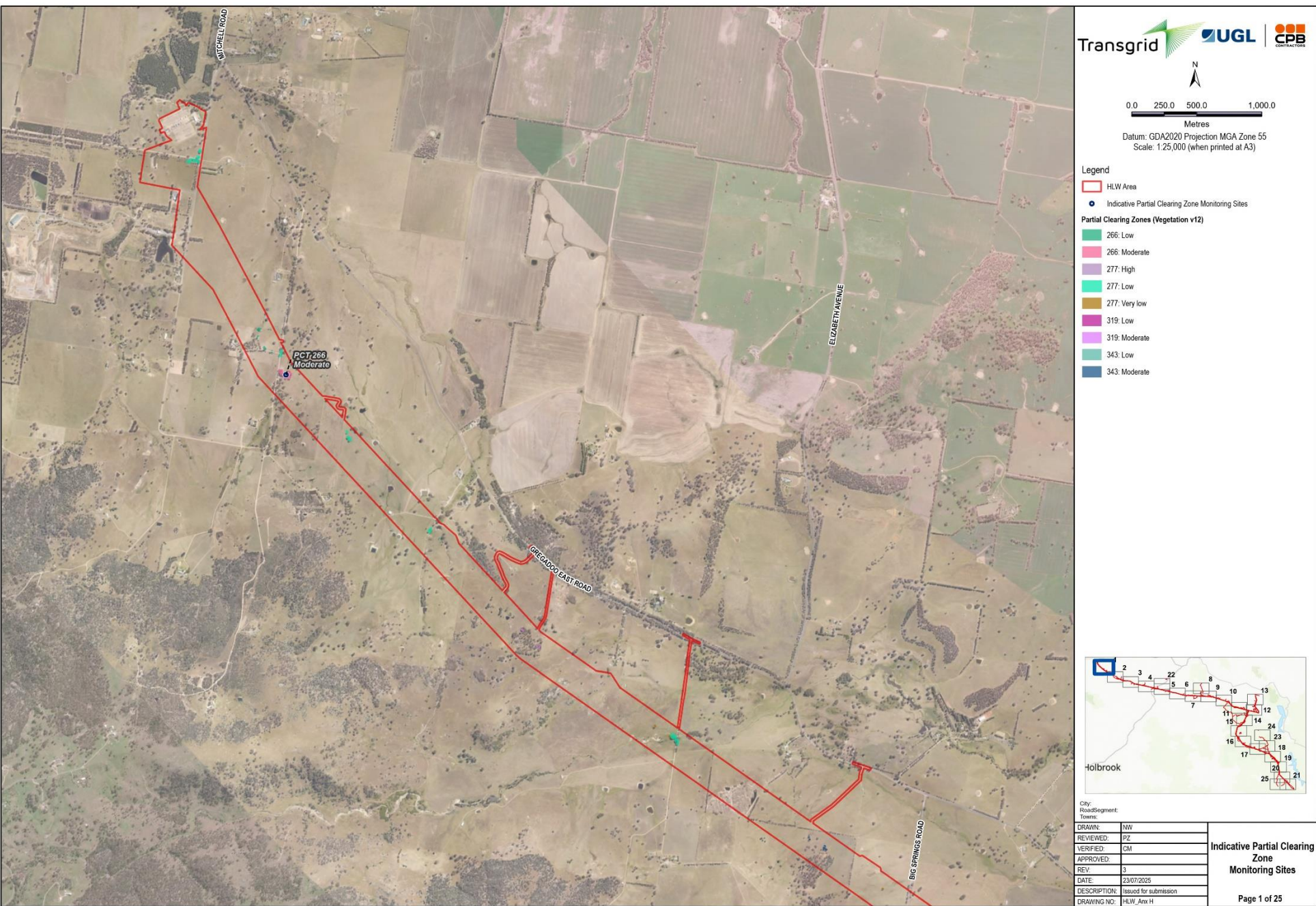
Part B: Partial Clearing Monitoring:

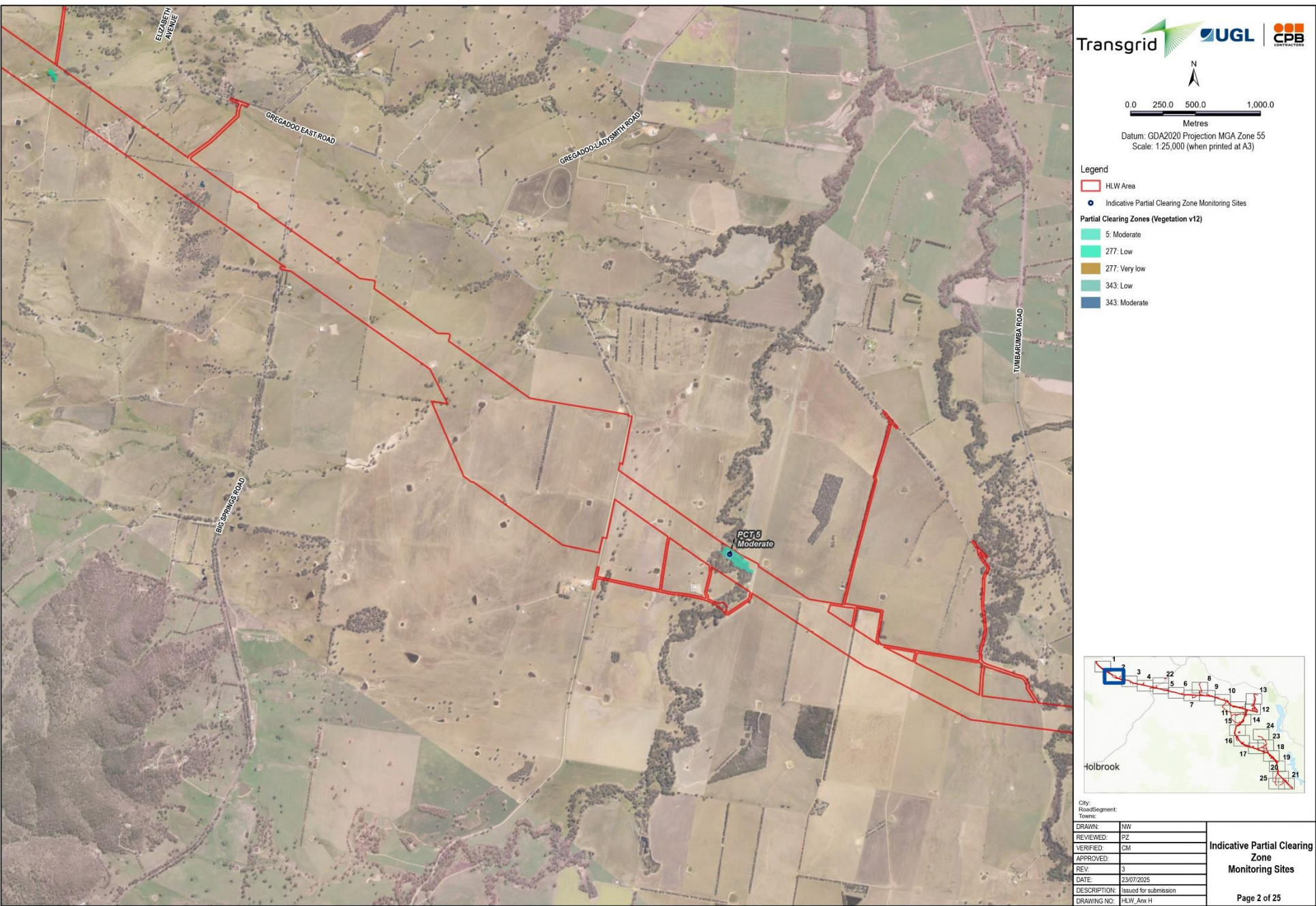
- Description of areas subject to partial clearance to date, including area (m²) of each PCT partially cleared.
- The name of contributors to the report and the BAM Accredited Assessor responsible for the results.
- Date(s).
- Weather conditions.
- VI scores for each paired plot by applying s4.3.3 of the BAM for assessing vegetation integrity (VI plot survey), including provision of field data sheets.
- Photographic monitoring images compared with previous and baseline images.
- Any other disturbance observed within partial clearance monitoring areas.
- Assessment against targets listed above.
- Recommendations for any additional actions required.

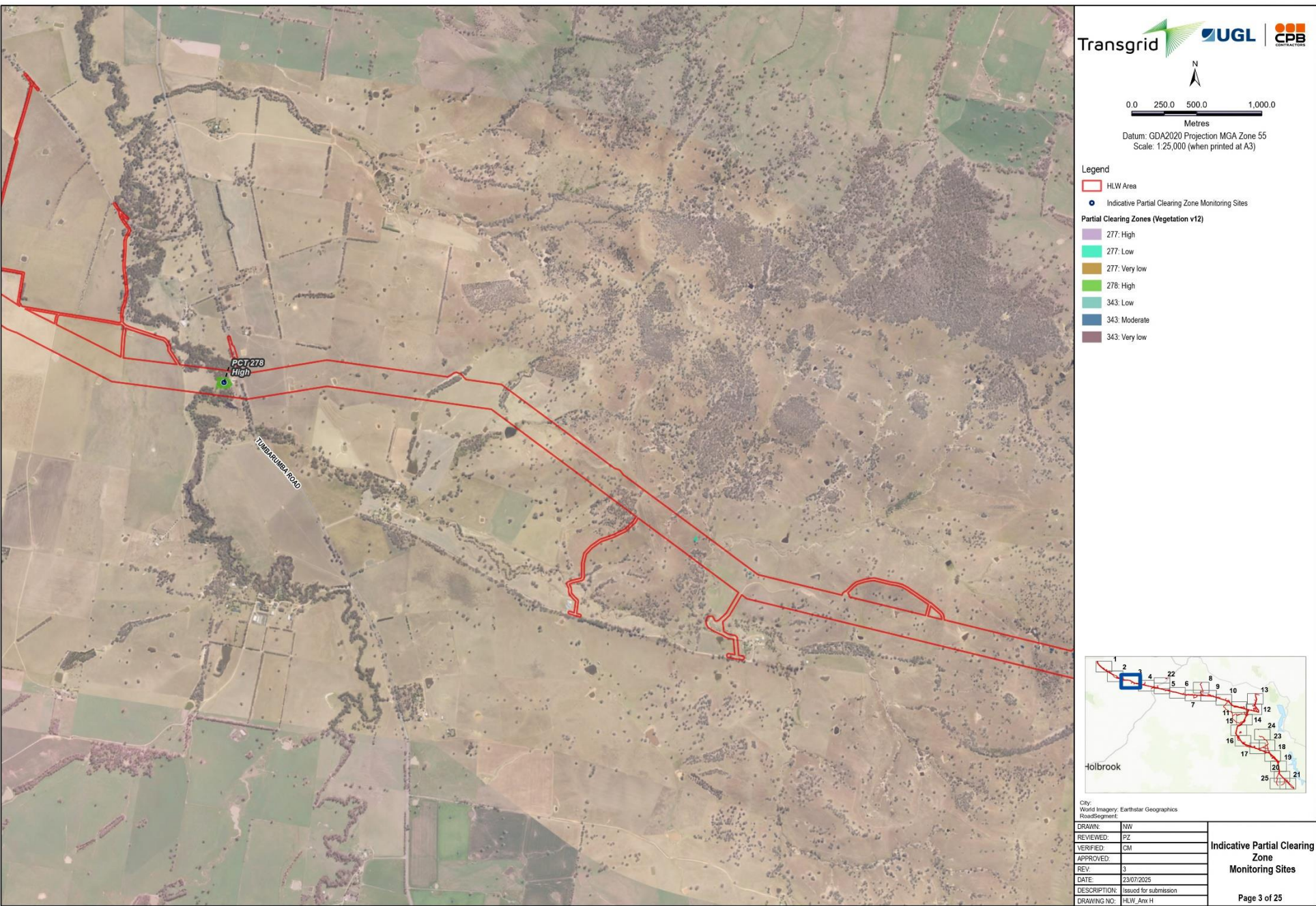
Reports will be provided to Transgrid within 6 weeks of the end of each reporting period.

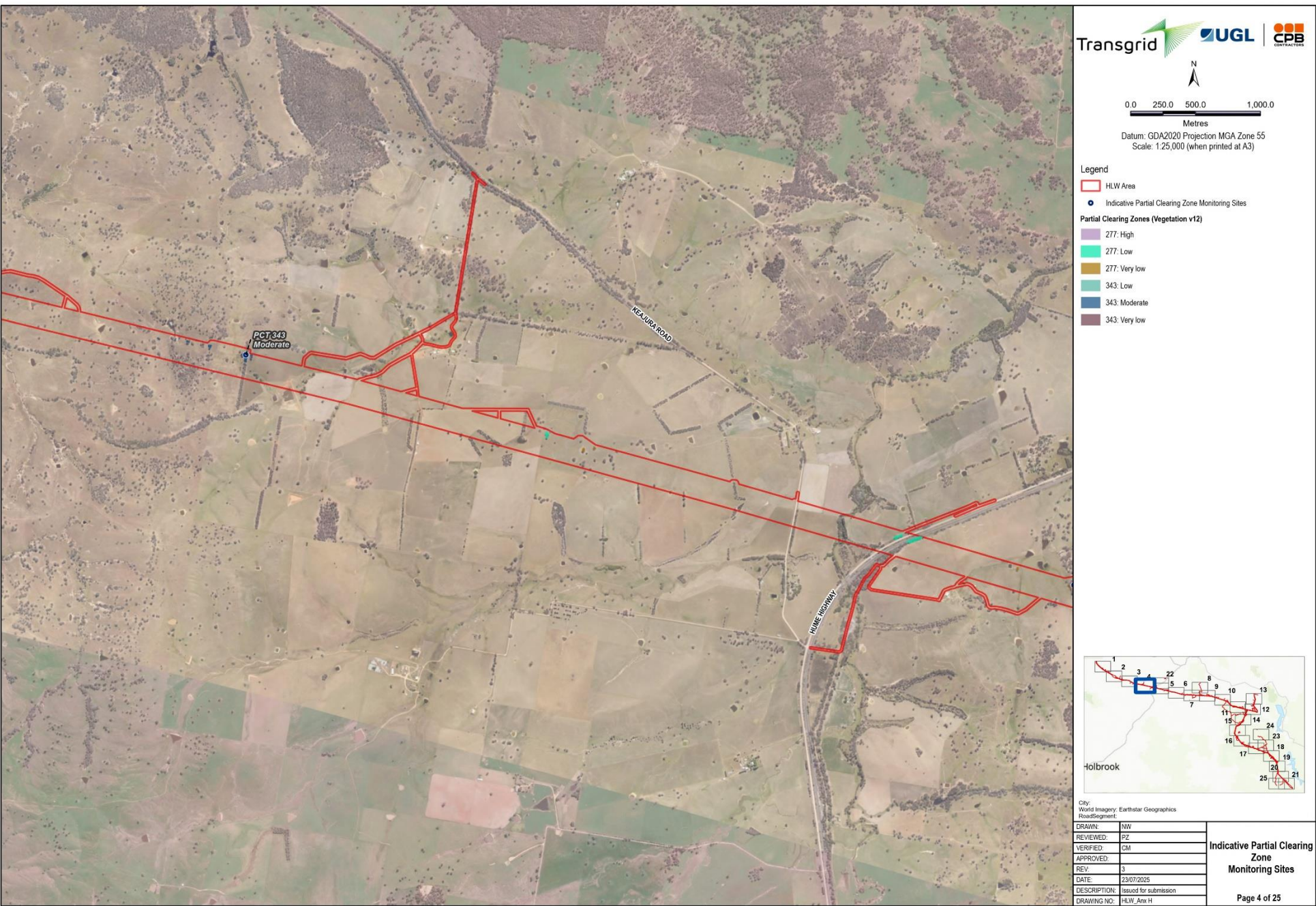
Adaptive management

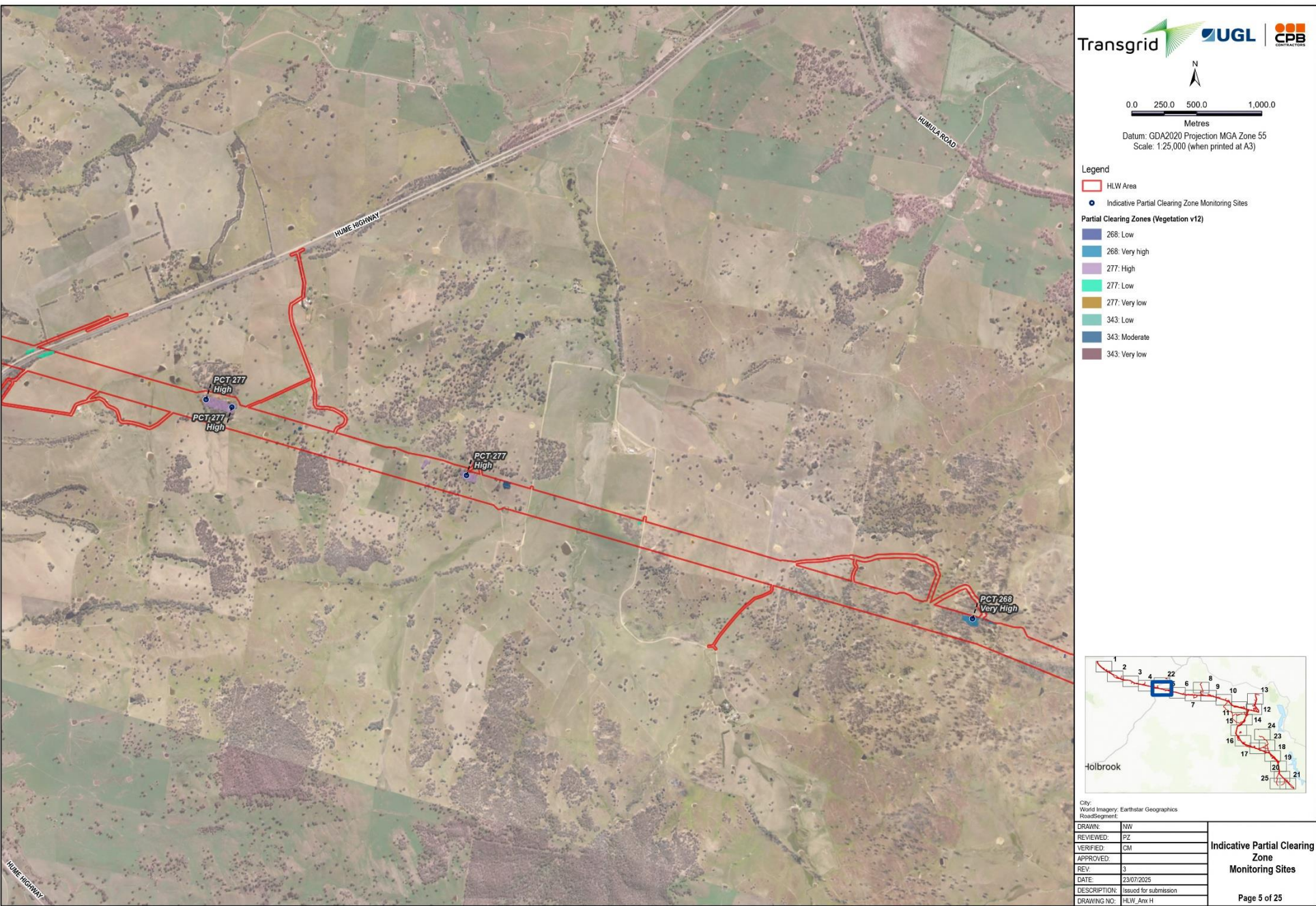
- Forecast exceedance of the clearing limits must be addressed by avoiding impact within the future clearing areas. If this is not possible, a request must be made in accordance with B25 to change the clearing limits.
- Unless otherwise explained by non-HLW associated impacts (e.g., extreme climate events, 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 Environmental Manager will determine the best course of action in consultation with Transgrid. Corrective actions that would be discussed and confirmed between 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 Biodiversity Monitoring Program and Annexure B: Clearing Protocol of the HLW BMP for any changes required.
 - Review if further Project training is required and implemented.
- Where the triggers are met, Transgrid will determine appropriate additional mitigation measures in consultation with CPHR.

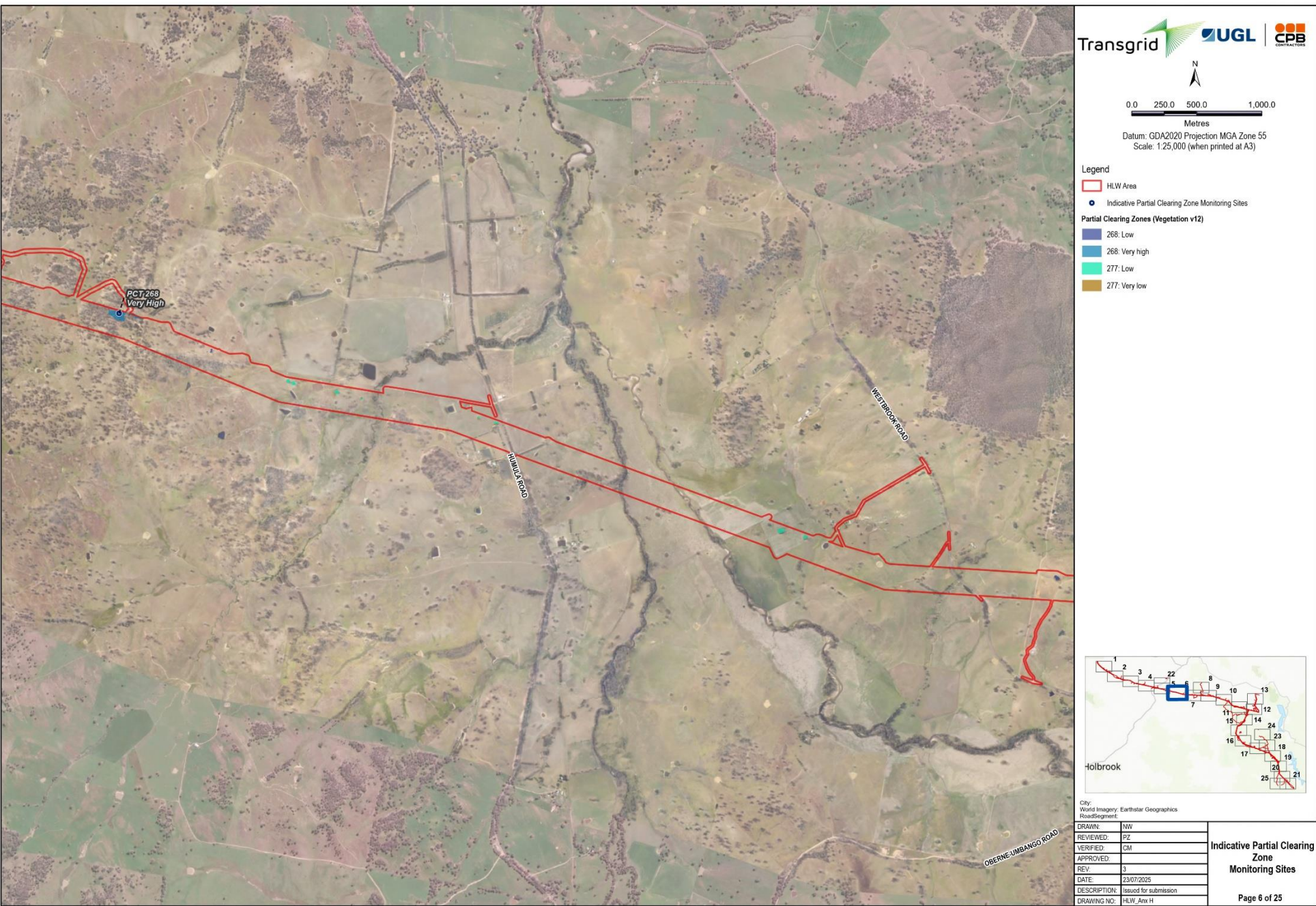


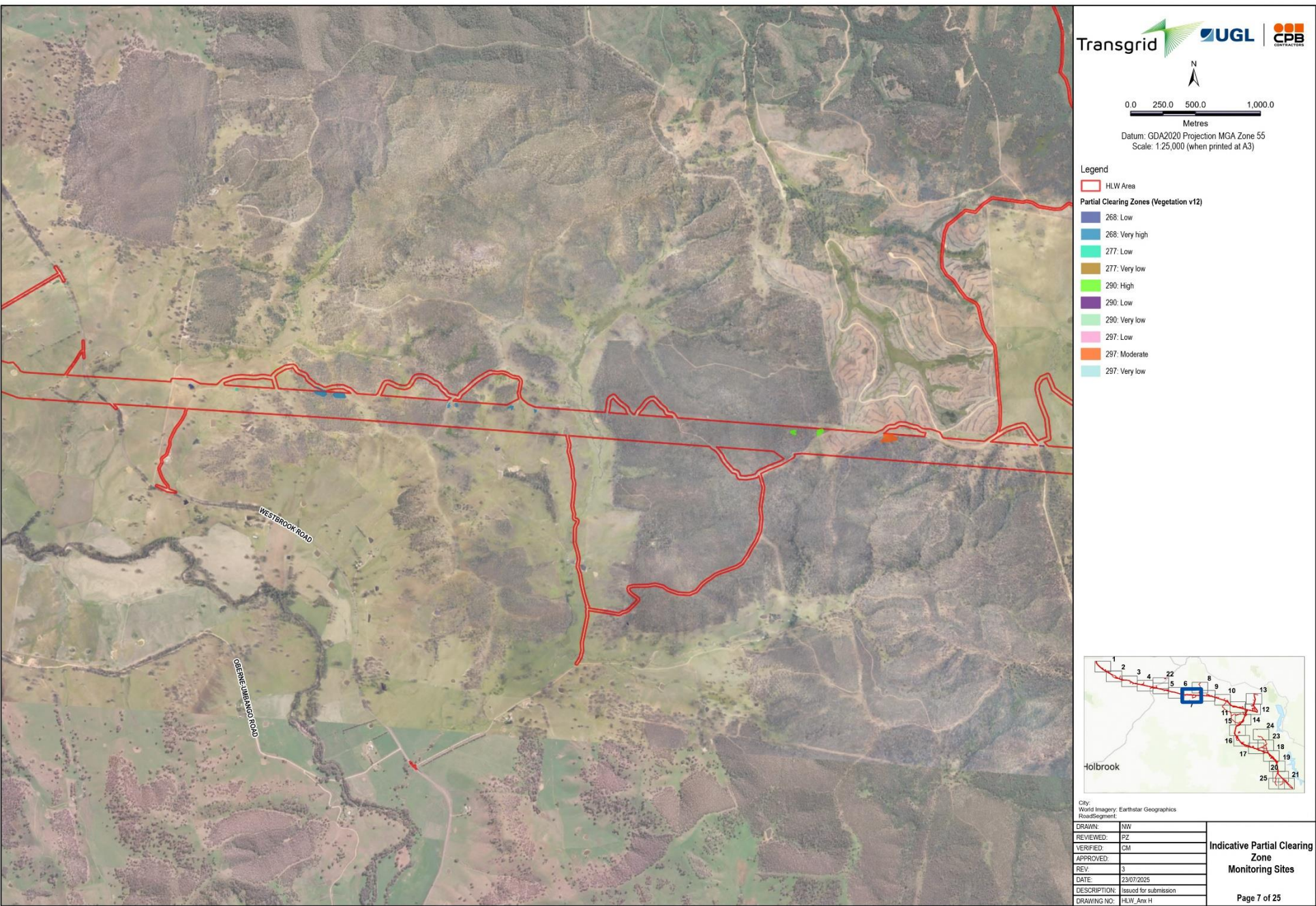


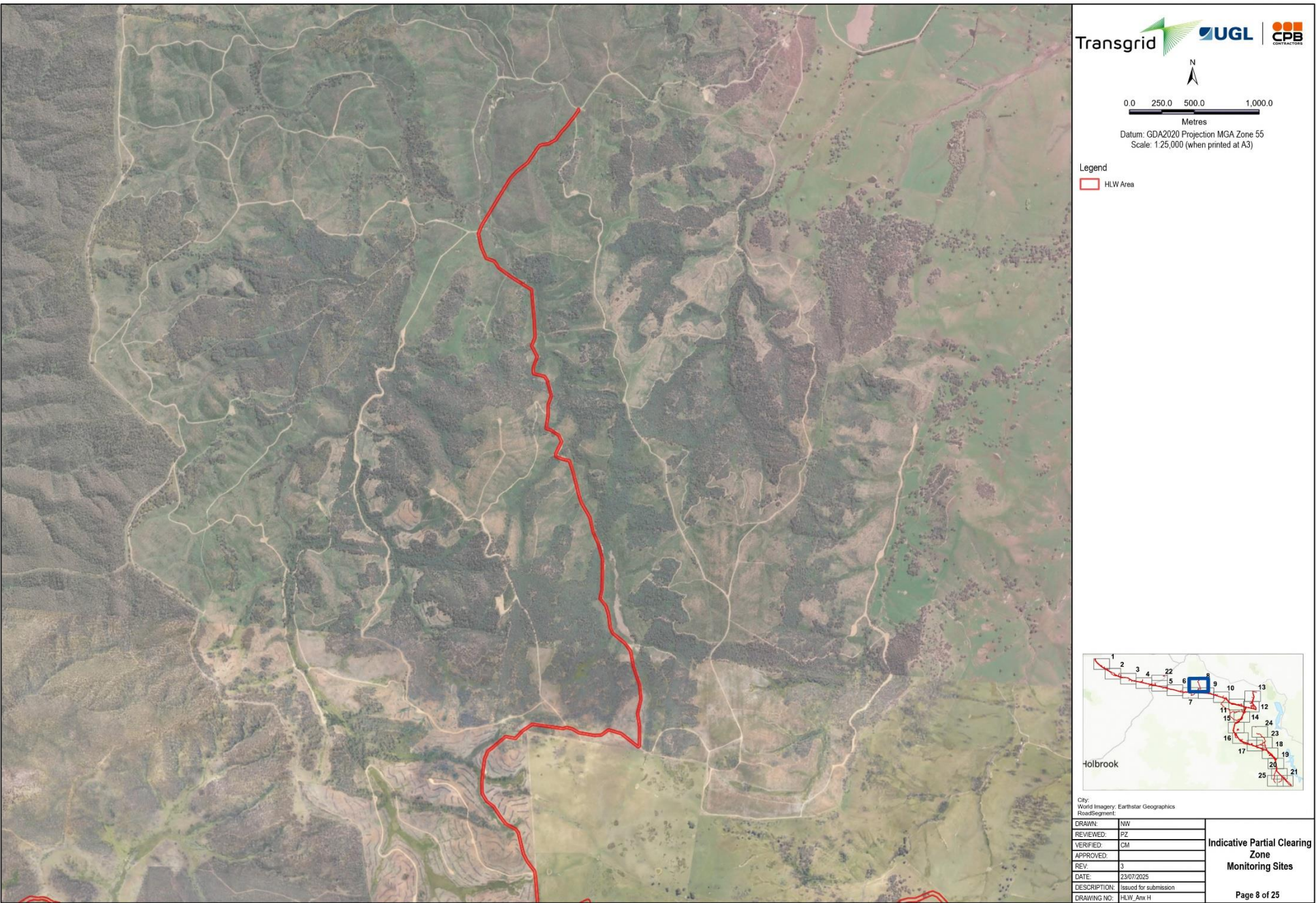


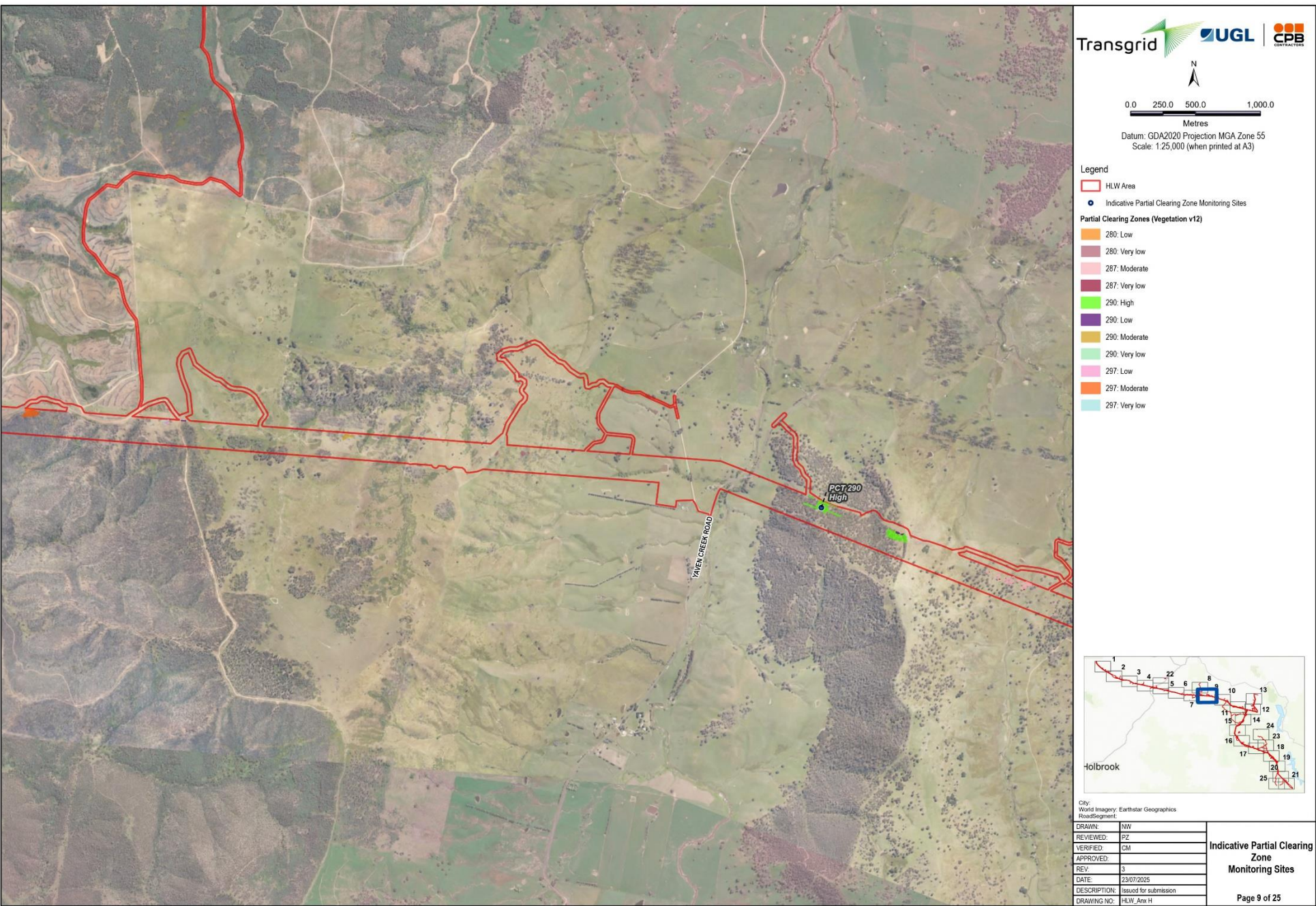


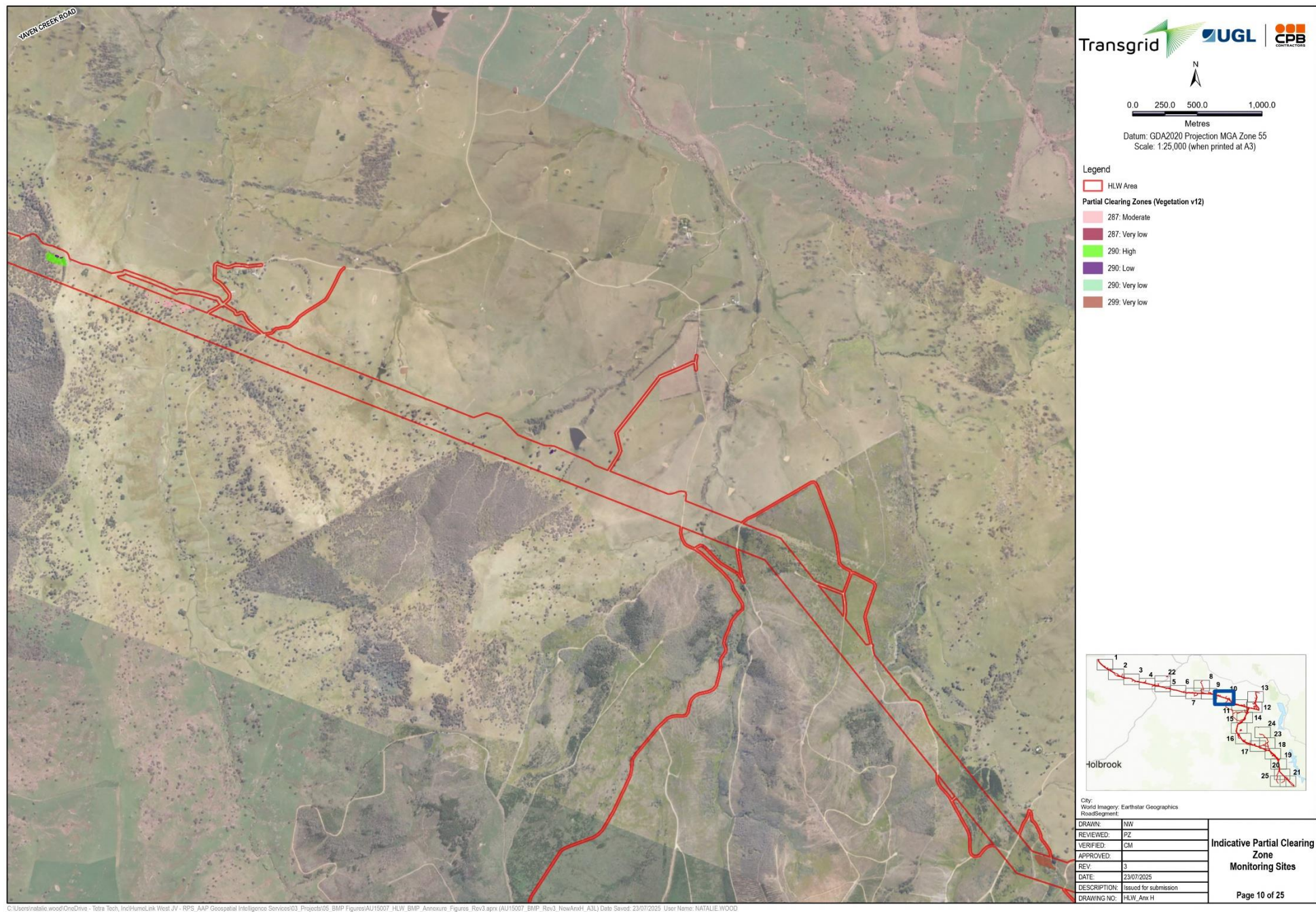


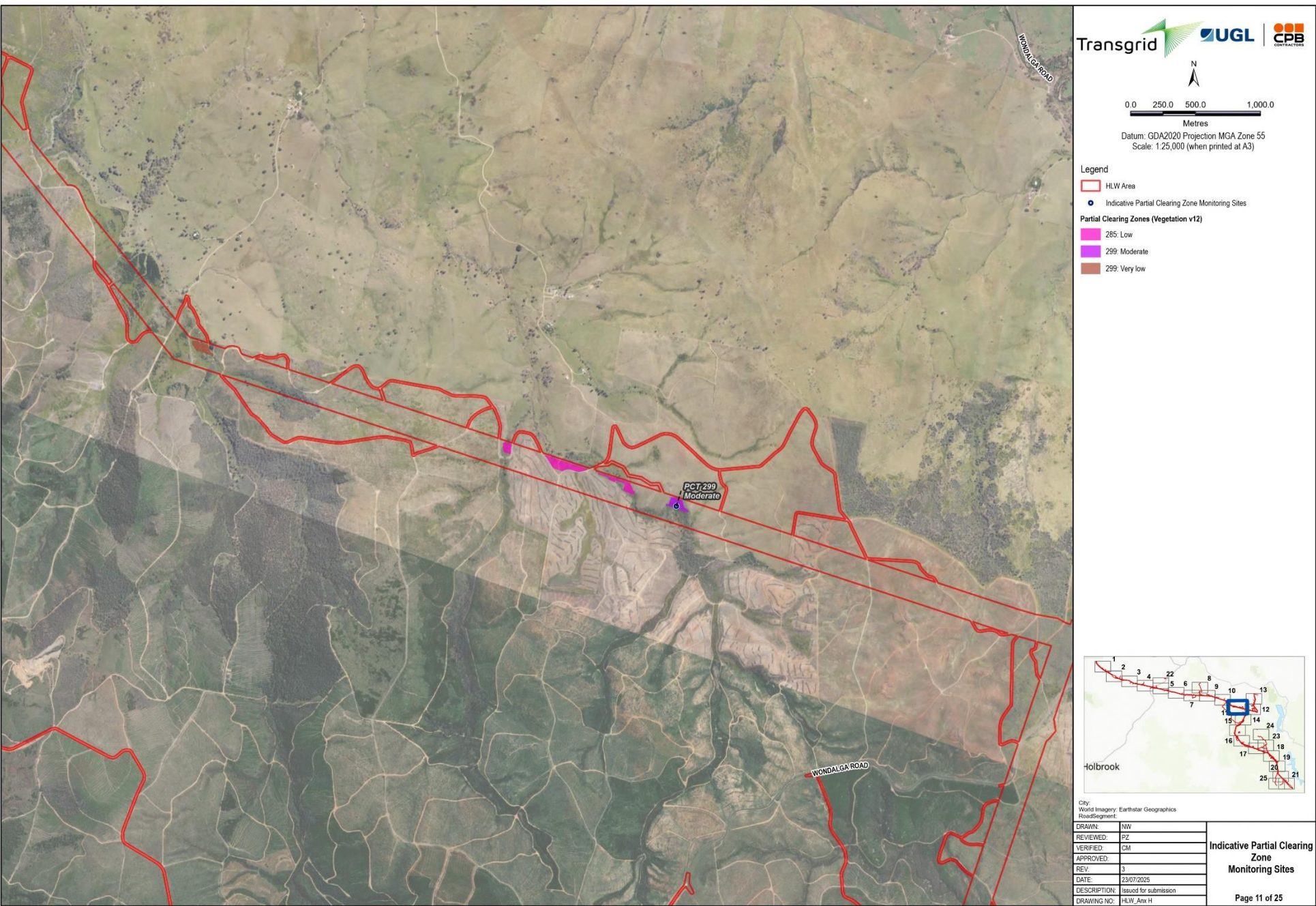


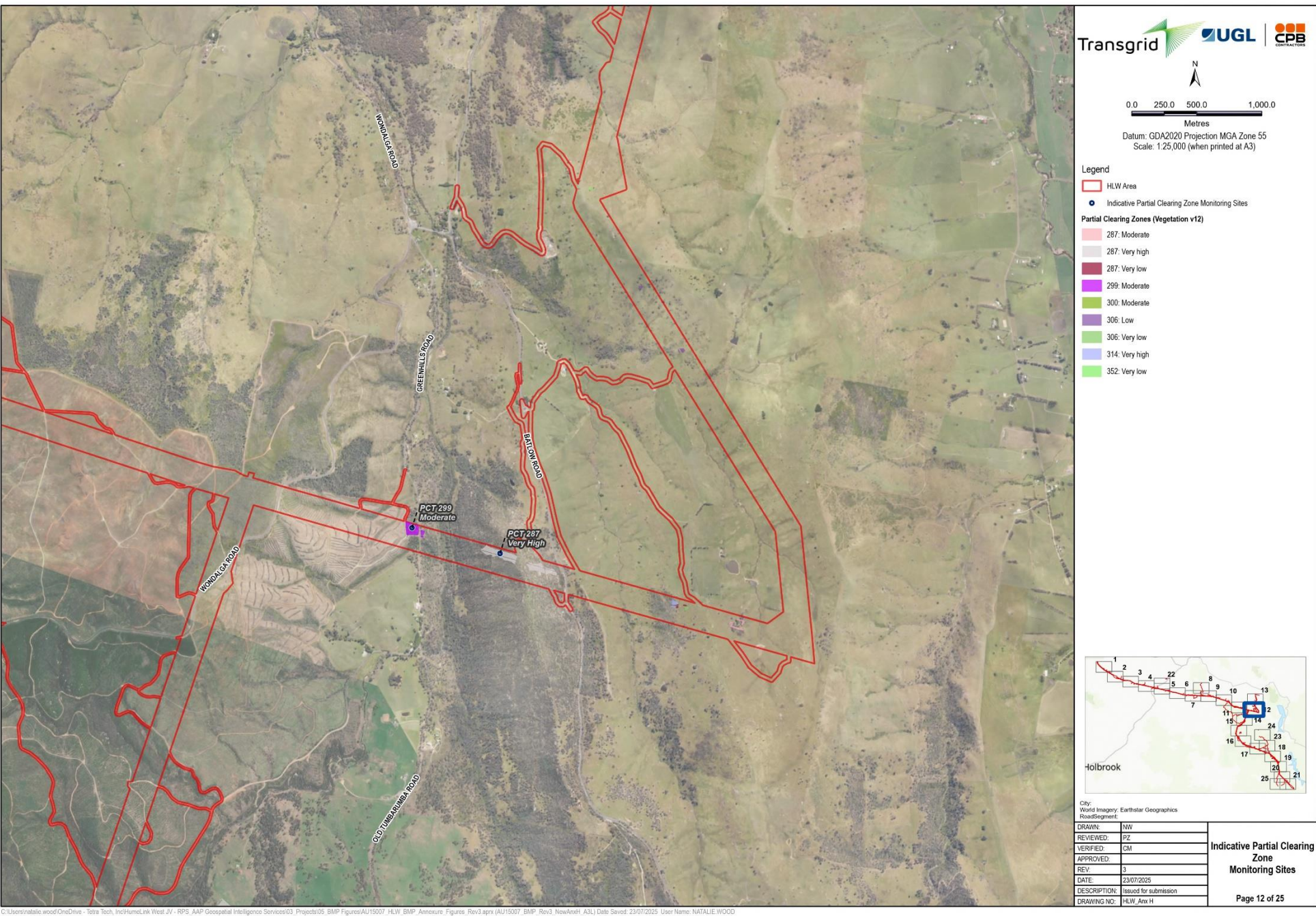


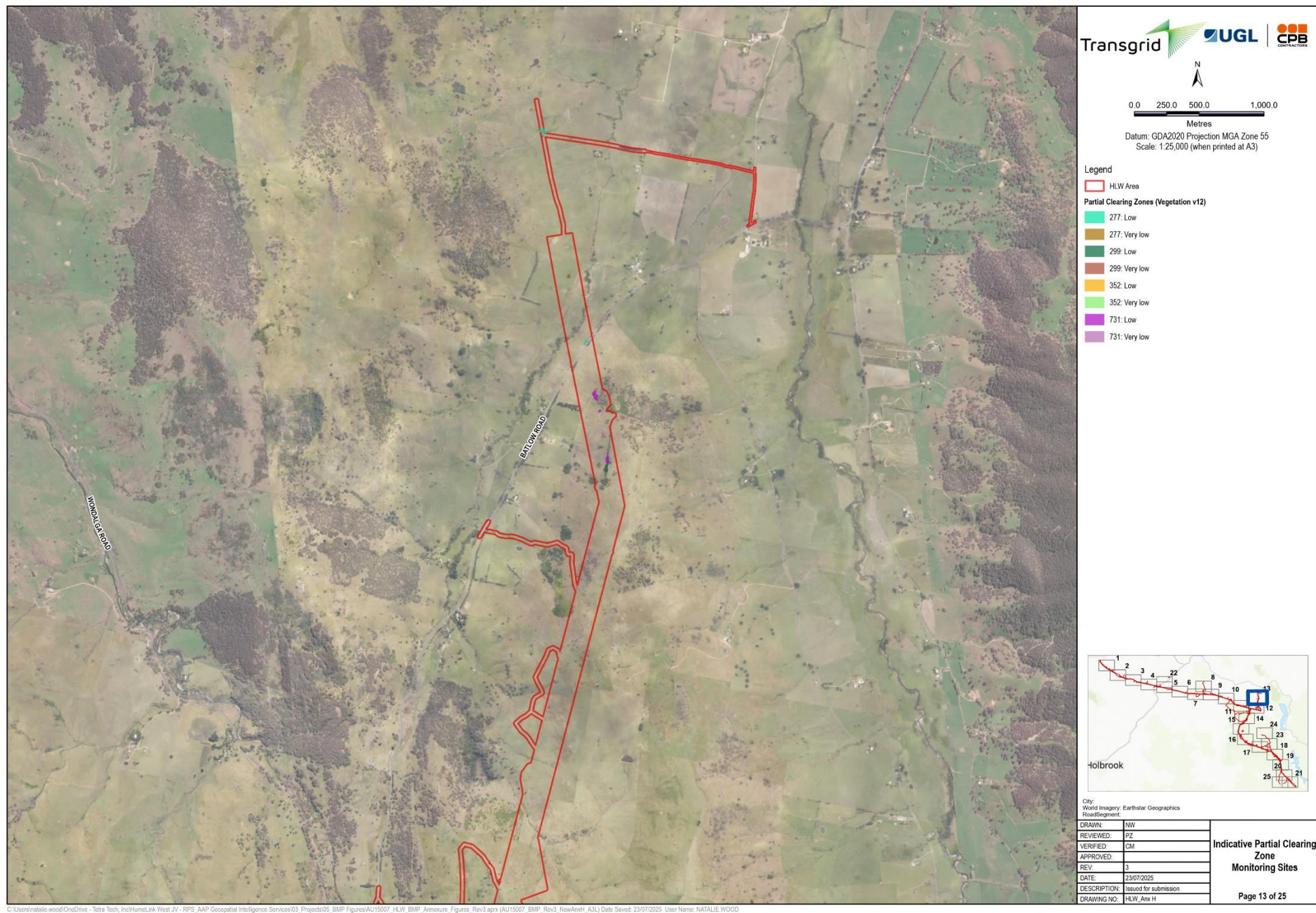


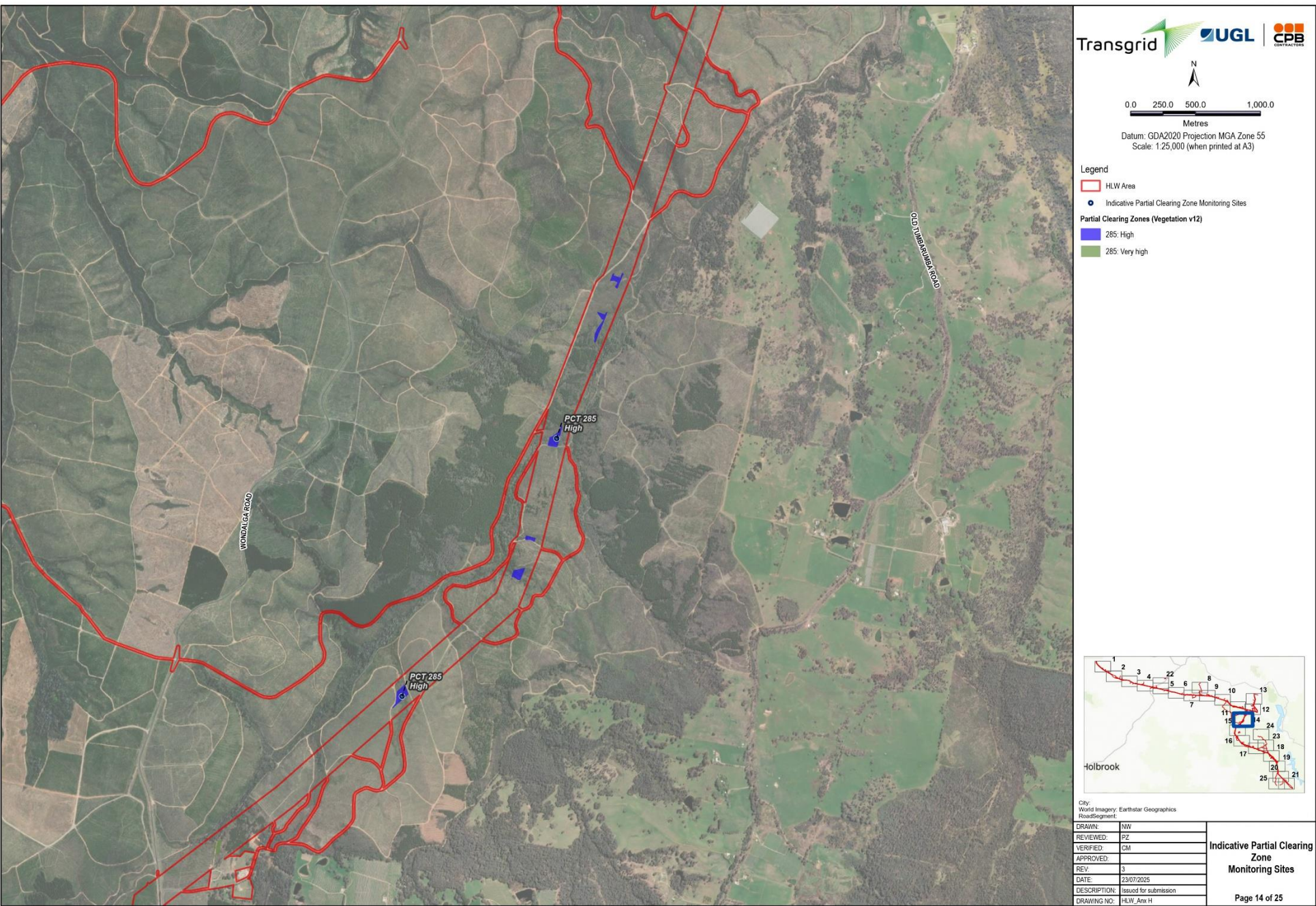


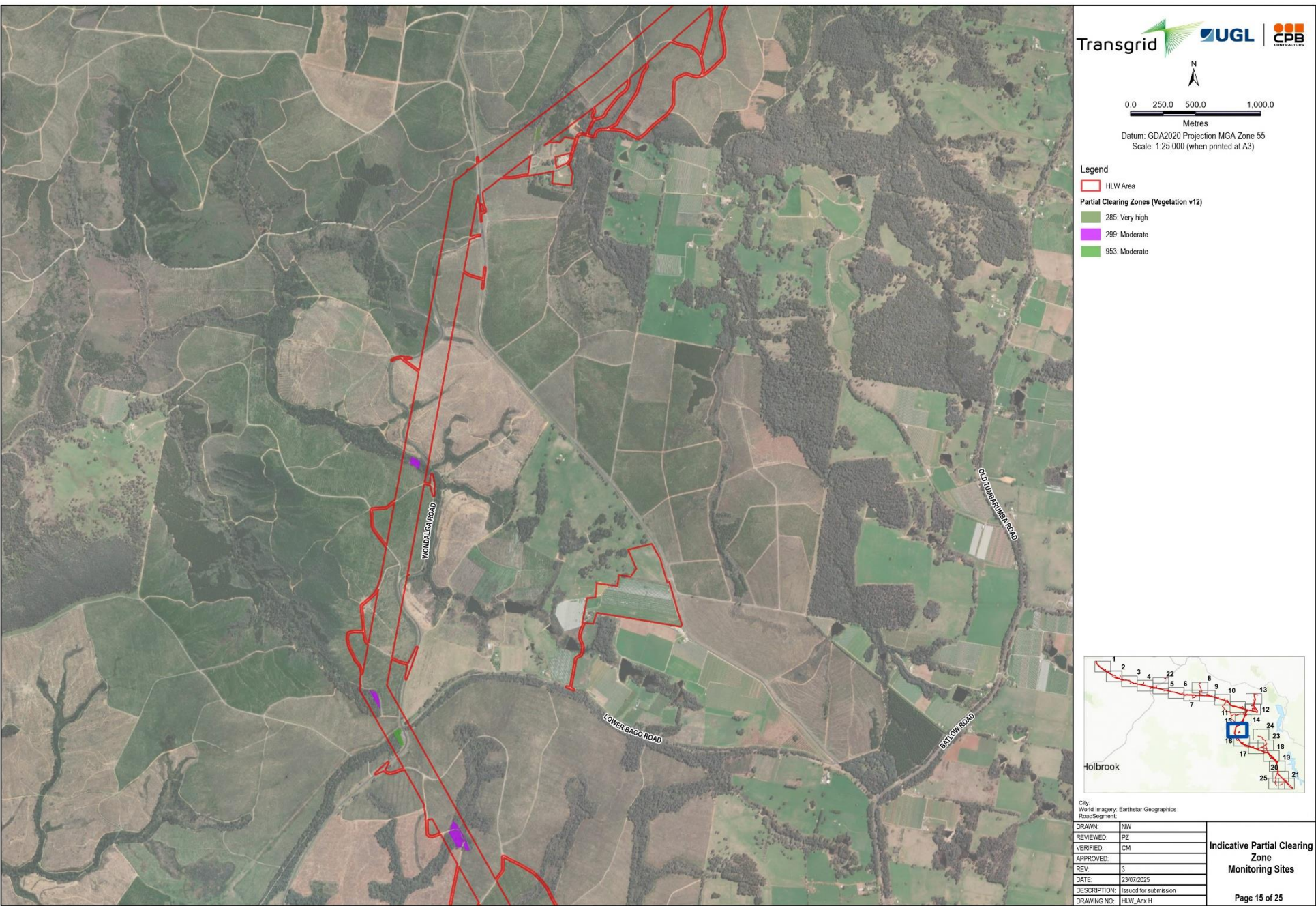


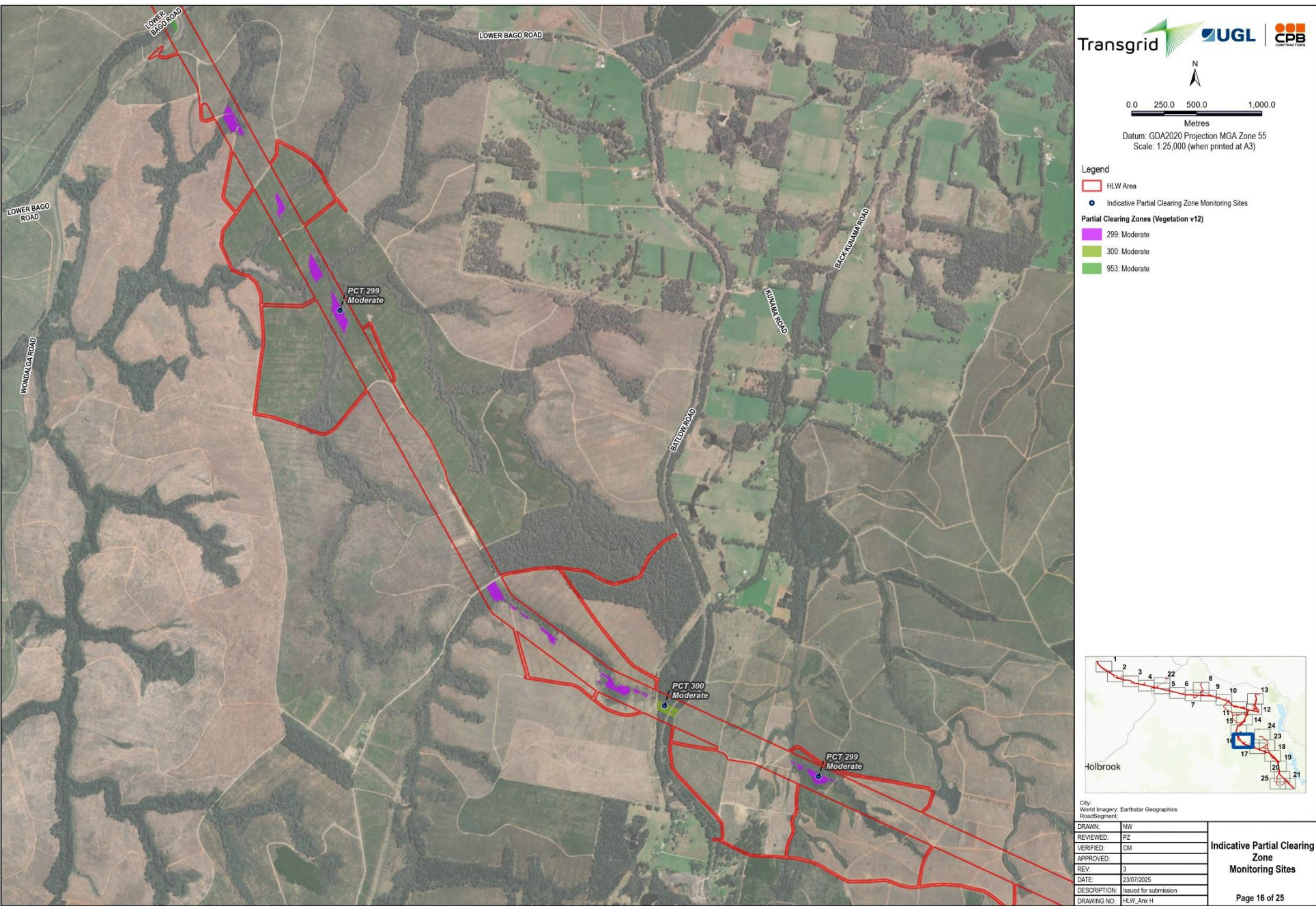


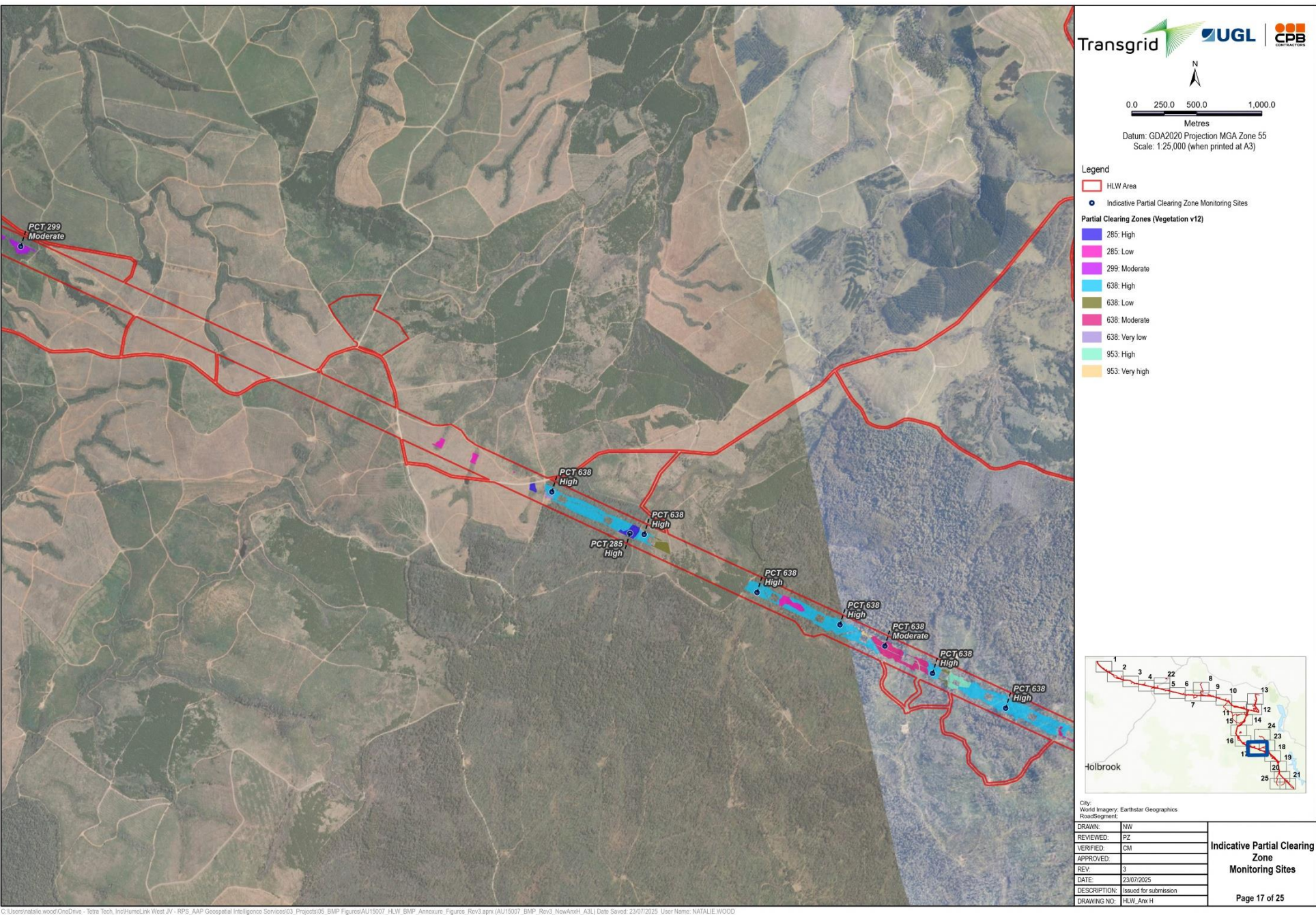


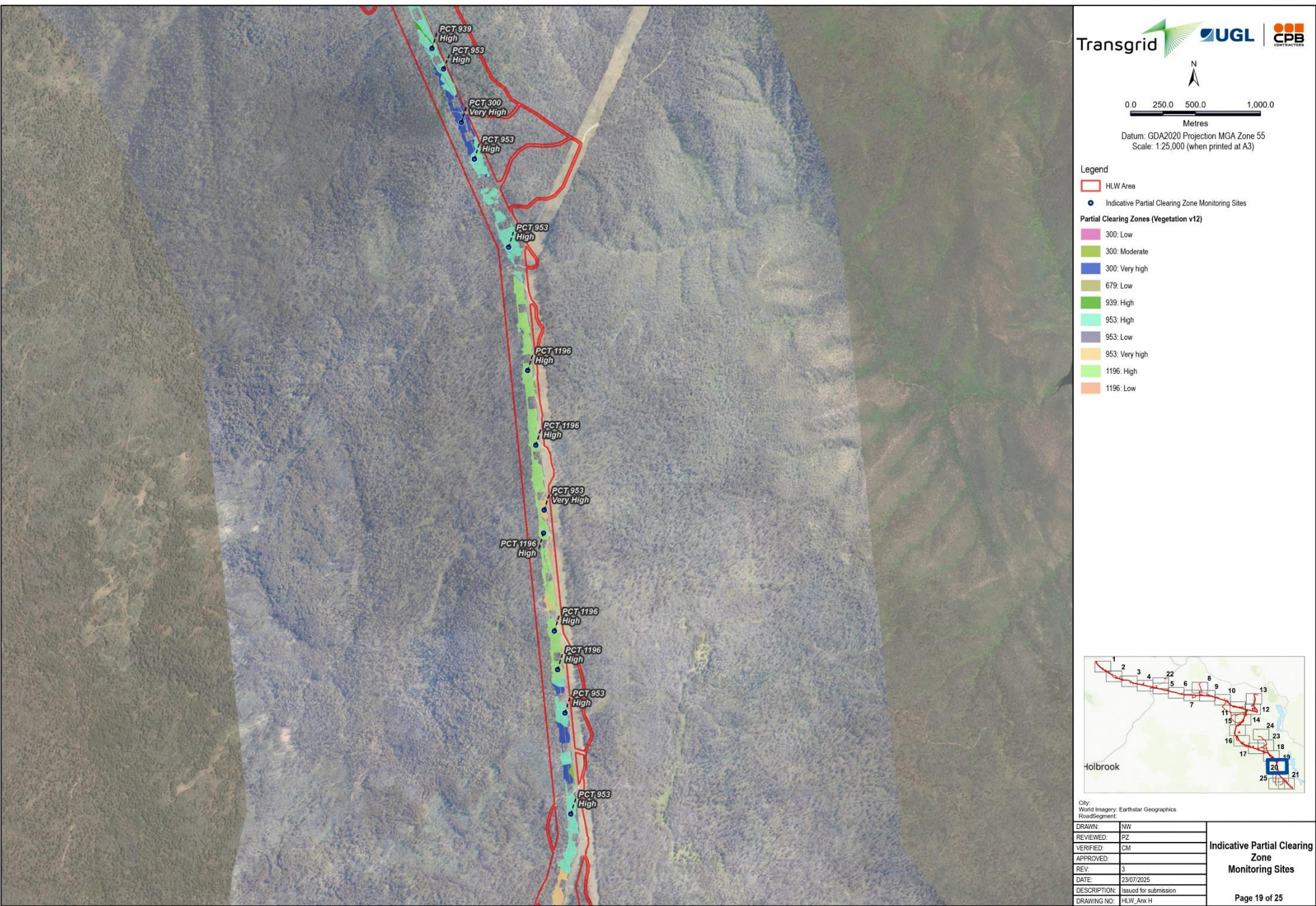


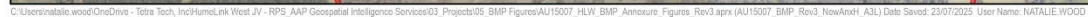


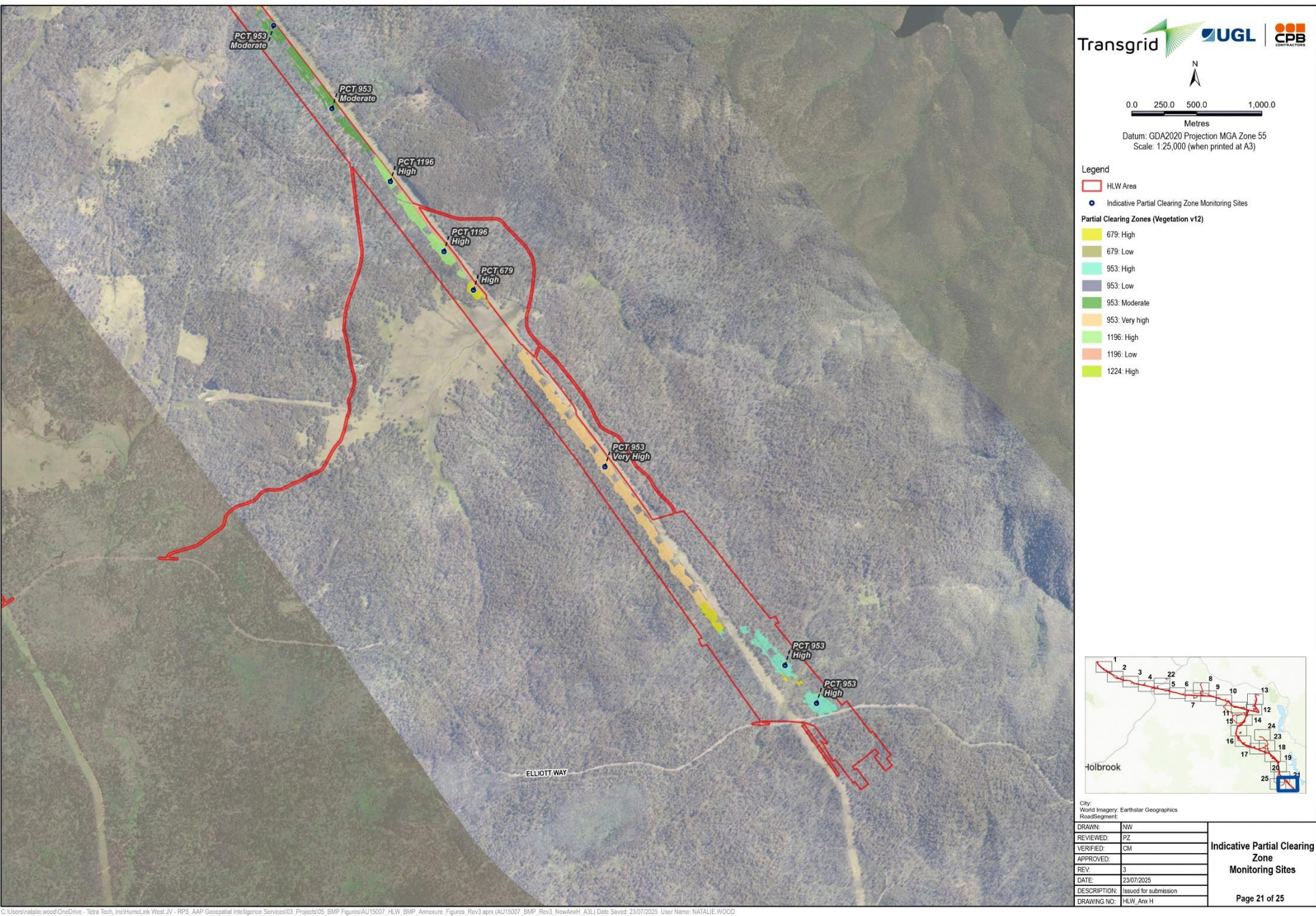


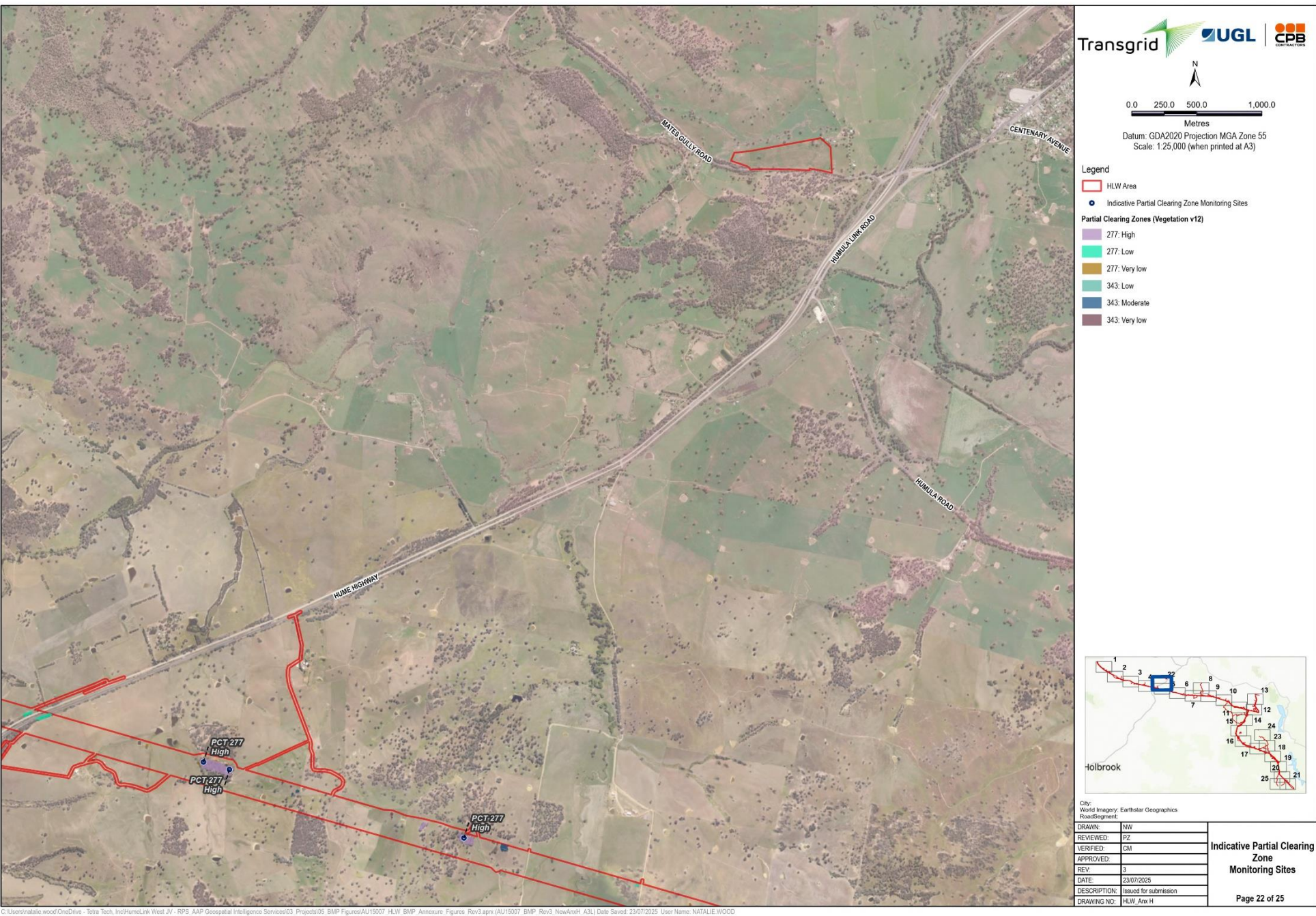


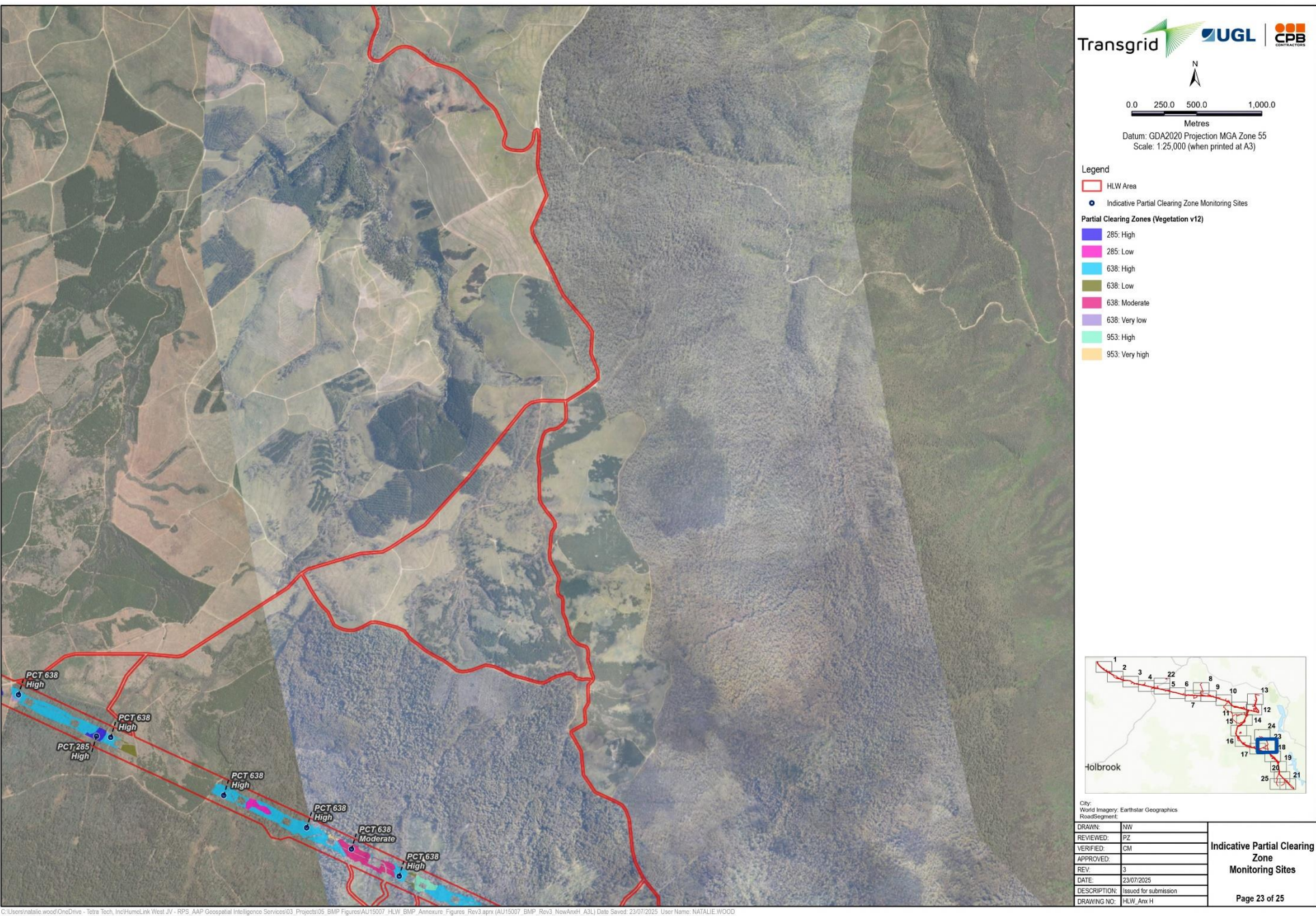














0.0 250.0 500.0 1,000.0

Metres

Datum: GDA2020 Projection MGA Zone 55

Scale: 1:25,000 (when printed at A3)

Legend

HLW Area

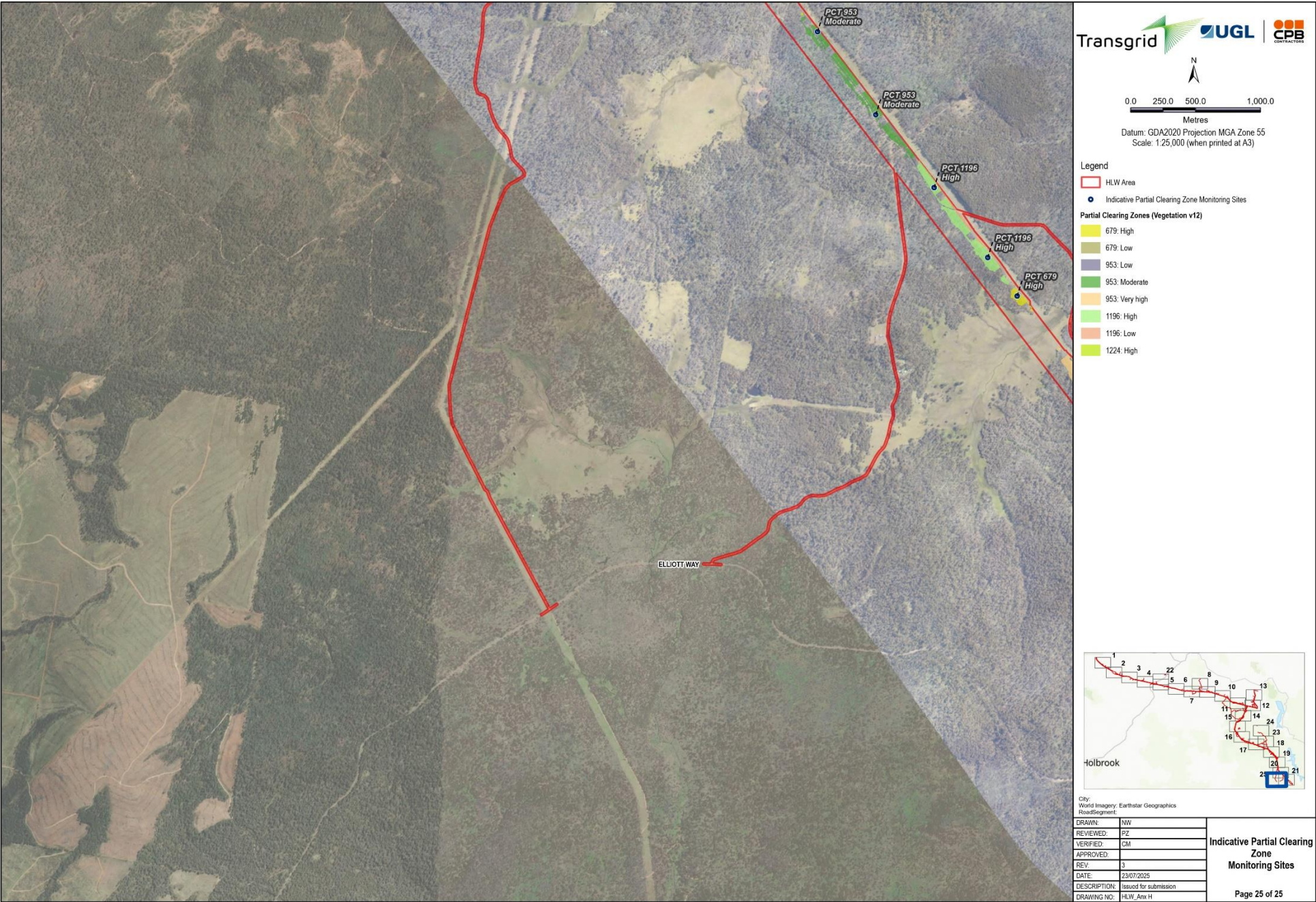
City: _____

World Imagery: Earthstar Geographics

RoadSegment: _____

DRAWN: NW	Indicative Partial Clearing Zone Monitoring Sites
REVIEWED: PZ	
VERIFIED: CM	
APPROVED: _____	
REV: 3	
DATE: 23/07/2025	
DESCRIPTION: Issued for submission	
DRAWING NO: HLW_Annex H	

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4.3. Threatened flora monitoring

Threatened flora monitoring is detailed in Table 4-7 below.

Table 4-7 Threatened flora monitoring

Threatened Flora Monitoring
Objective and target
Monitor indirect impacts (e.g., dust, erosion, trampling, weeds) on threatened flora occurring adjacent to disturbance zones. Targets for monitoring include: - No measurable decline in abundance, condition, health, or population extent of threatened flora located within 30 m of disturbance zones. - No increase in weed % compared to control sites.
Location and sampling units
Flora monitoring sites have been identified at all locations where threatened flora species (<i>Ammobium craspedioides</i>, <i>Pimelea bracteata</i>, <i>Prasophyllum bagoense</i>, <i>Prasophyllum keltonii</i> & <i>Xerochrysum palustre</i>) have been recorded within 30 m of disturbance zones during Revised BDAR surveys (Section 4.7), as well as >30 m from disturbance sites (if present) for control sites. If pre-clearing surveys or biodiversity verification reporting identify any additional species within 30 m of disturbance zones, monitoring of impact and control sites will occur in accordance with this monitoring program.
Method
Before-After-Control-Impact (BACI) monitoring as detailed below. Fixed photographic monitoring points and vegetative monitoring 20 x 20 m plot (or 400 m² equivalent for linear areas). Each plot must be assessed in accordance with composition and structure plot guidelines listed in the BAM 2020. Plots will be established and permanently marked using a stake at all corners, tagged for future reference. In addition to vegetation monitoring required by the BAM 2020, record the following specific to the targeted threatened flora: - Presence/absence. - Health/condition – score based on leaf colour, turgor, flowering, insect damage, etc. - Recruitment – # seedlings, juveniles. - Dust/erosion – score based on dust accumulation, exposed root, sediment runoff, etc. - Trampling or disturbance – broken stems, soil compaction, vehicular tracks.
Timing, effort and frequency

Threatened Flora Monitoring

Where possible, one monitoring event should be undertaken prior to construction activities occurring, or as close as possible to commencement (ideally within 3 months). Monitoring will then be undertaken annually in Spring and Summer during construction to encompass the approved survey period for current target species:

- *Ammobium craspedioides* = Sep-Nov.
- *Pimelea bracteata* = year-round.
- *Prasophyllum bagoense* = Dec.
- *Prasophyllum keltonii* = Jan.

Additional monitoring may be required to capture additional flora species identified during pre-clearing surveys or biodiversity verification reporting, with locations incorporated into this program per Section 2.1.

Data analysis

Based on above survey methods, compare vegetation monitoring plot data of pre-construction (if available), control and impact sites, ensuring:

- Observed decline in count, cover or recruitment <10% in impact vs control sites, increase in weed cover <10% compared to control sites, OR
- No significant change from baseline ($p \leq 0.05$), with enough replicates for statistical analysis, in impact vs control sites.

Reporting

Annual threatened flora monitoring will be summarised in the BMP Monitoring Report, including the following:

- Details of monitoring methods.
- Results and observations – monitoring plot data, threatened species occurrence, health, recruitment, existing disturbance etc.
- Discussion/interpretation of impacts – comparison of impact monitoring data with pre-clearing/control data to:
 - Identify decline in abundance, condition, health, or population extent of threatened flora.
 - Identify increased disturbance (e.g., dust, erosion, trampling).
 - Investigate potential causes, HLW-related or otherwise.
 - Investigate consequence of impacts on target flora.
- Adaptive management (per the below).

Annual BMP Monitoring Reports will be provided to CPHR, NPWS, FCNSW and DCCEE as soon as they are available.

Adaptive management

Threatened Flora Monitoring

- Initial investigation to document potential causation between decline and HLW construction related impacts.
- Development of a mitigation plan, in consultation with NSW DCCEEW Environment and Heritage, addressing causes of decline as determined in initial investigation.
- If this is ineffective, undertake seed collection and propagation from in-situ populations (if appropriate) and try to re-establish local populations. This will be accompanied by additional monitoring.
- If this is ineffective, additional offsets may be required.

4.4. Threatened owl, cockatoo and parrot monitoring

Threatened owl, cockatoo and parrot monitoring is detailed in Table 4-8 below.

Table 4-8 Threatened owl, cockatoo and parrot monitoring

Threatened Owl, Cockatoo and Parrot Monitoring
Objective and target
Monitor for threatened owls, cockatoos and parrots adjacent to disturbance zones to detect any significant decline or displacement caused by construction activities. Targets for monitoring include: • Occupancy = target species occupy identified natural or artificial hollows. • Breeding activity = evidence of nesting/breeding (e.g., courtship, nesting, incubation, feeding of chicks). • Site fidelity = repeat use of hollows across years. • Artificial hollow use = use of artificial hollows. • Breeding success = breeding events result in successful fledging of young. • Disturbance response = nesting activity maintained in proximity to disturbance zones.
Location and sampling units
All threatened owl, cockatoo and parrot nest trees identified during pre-clearing surveys or biodiversity verification surveys within 100 m of disturbance zones will be subject to monitoring. Each confirmed nest tree will comprise a sampling unit. If nest trees are identified > 100 m from disturbance zones, these nest trees will constitute control sites to monitor for disturbance response.
Method
At all confirmed nest trees within (impact) and over 100 m (control) from disturbance zone, the following will occur: • One motion-triggered or timelapse camera will be installed at each hollow entrance. • One endoscopic camera inspection of the nest hollow will be conducted. • Artificial hollow monitoring per Section 4.1.1.
Timing, effort and frequency

Threatened Owl, Cockatoo and Parrot Monitoring

Prior to clearing, targeted pre-clearing surveys will be undertaken in assumed and known habitats for threatened owls, cockatoos and parrots per Annexure B: Clearing Protocol to identify confirmed nest trees. Following clearing and annually through construction, any nest trees identified within and over 100 m of disturbance zones will continue to be monitored per this program during breeding periods:

- Sooty Owl (breeding season = Mar-Sep).
- South-eastern Glossy Black-Cockatoo (breeding season = Apr-Aug).
- Masked Owl (breeding season = Apr-Nov).
- Powerful Owl (breeding season = May-Oct).
- Superb Parrot (breeding season = Sep-Nov).
- Barking Owl & Gang-gang Cockatoo (breeding season = Oct-Jan).

Monitoring is to continue through to fledging.

Data analysis

Based on above survey methods, the following metrics/indicators will be used/analysed:

- Occupancy = direct observations of adult birds, chew marks, faeces / whitewash, feathers, prey remains.
- Breeding activity = observation of nesting behavior, eggs, chicks, or fledglings. Observation of adults entering hollows repeatedly.
- Site fidelity = return of the same species/individuals to known hollows.
- Artificial hollow use = artificial hollow use is recorded for target species.
- Breeding success = active nests produce successful fledglings.
- Disturbance response = ongoing occupancy and breeding activity.

Reporting

Threatened Owl, Cockatoo and Parrot Monitoring

Annual threatened owl, cockatoo and parrot monitoring will be summarised in the BMP Monitoring Report, including the following:

- The name and qualification of contributors to monitoring, data analysis and reporting.
- Date(s) of surveys.
- Survey methods and extent, including maps of impact and control nests (if relevant).
- Distance from disturbance for each monitored nest.
- Weather conditions.
- Survey results per monitored nest including:
 - Species and numbers of individuals.
 - Direct and indirect (e.g., chew marks, presence of feathers or faecal staining) signs of occupancy.
 - Frequency of adult visits.
 - Behaviours indicating incubation (e.g., female remaining inside hollow) and feeding.
 - Presence of nesting material, eggs or chicks.
 - Individual markings (if identifiable) or behaviours suggesting returning pairs.
 - Date of hatching and fledging (if witnessed).
- Results of artificial hollow monitoring, specific to threatened owl, cockatoos and parrots per Section 4.1.1.
- Supporting photographic/video evidence.
- Assessment against targets listed above.
- Recommendations for any additional actions required.

Annual BMP Monitoring Reports will be provided to CPHR, NPWS, FCNSW and DCCEEW as soon as they are available.

Adaptive management

- Initial investigation to document potential causation between decline and HLW construction related impacts.
- Development of a mitigation plan in consultation with NSW DCCEEW Environment and Heritage, addressing causes of decline as determined in initial investigation. This may include increased monitoring or additional construction-related mitigation measures.
- If this is ineffective, additional offsets may be required.

4.5. Threatened frog monitoring

Threatened frog monitoring has been divided into occupancy monitoring (Table 4-9) and habitat monitoring (Table 4-10) listed below.

Table 4-9 Threatened frog occupancy monitoring

Threatened Frog Occupancy Monitoring	
Objective and target	
Determine species occupancy (i.e., presence or absence) and estimate frog species abundance of the threatened frog target species and document any changes arising from HLW. Targets for monitoring include: • Maintain evidence of threatened frog occupancy comparable to baseline (pre-construction) or control sites. • No reduction greater than 20%.	
Location and sampling units	
Frog monitoring sites have been identified 250 m upstream (control) and downstream (impact), total transect effort of 500 m in assumed threatened frog habitats. These locations are displayed in Section 4.7, including: • 1 x site for Sloane's Froglet (including 1 control and 1 impact site). • 2 x sites for Yellow-spotted Tree Frog (including 1 control and 1 impact site). • 1 x site for Booroolong Frog (including 1 control and 1 impact site).	
Method	
Before-After-Control-Impact (BACI) monitoring as detailed below. Aural-visual surveys are to be completed as 500 m transects or, if accessible, through shallow wetlands for a 120-minute period per transect. Each transect is to be physically demarcated to ensure repetition of monitoring events. Monitoring methods include the following, to be completed at each 500 m transect (DPIE, 2020b): • Aural-visual surveys commence with an aural survey where two surveyors listen for calls (in silence and darkness), for a minimum of five minutes. • Visual surveys – Spotlight along the length of the transect to detect frogs via eye-shine. Focus on suitable habitat such as offline pools (for Sloane's Froglet) and emergent aquatic vegetation (Yellow-spotted Tree Frog). A minimum of five minutes should be taken to cover each 50 m of transect with a visual search. • Aural surveys – Listen for target frog calls every 50 m of the transect. Include a call-playback component where a loudspeaker is used to broadcast the calls of target frogs to elicit a response. The call is broadcast continuously through the speaker for a period of no less than two minutes and responses are typically heard within the first minute. The playback period is followed by a two-minute listening period to detect any late responses or responses masked by the sound of the broadcast call. • Record date, weather conditions, species, count, sex (where possible), location (easting and northing as well as descriptive attributes) and observers. • Hygiene protocols to be followed to prevent the spread of chytrid fungus (refer to Annexure E: Biosecurity Management Plan of the HLW BMP).	
Timing, effort and frequency	

Threatened Frog Occupancy Monitoring

Surveys will be undertaken for 120-minutes per night across 4 nights during the approved survey periods:

- Sloane's Froglet = Jul-Aug.
- Booroolong Frog = Oct-Dec.
- Yellow-spotted Tree Frog = Nov-Dec.

Survey must be undertaken after appropriate rainfall (e.g. flooding rains), with at least one monitoring event undertaken, where weather permits, prior to construction works commencing at each site. Ongoing monitoring will occur annually during construction works during the approved survey periods. Surveys during dry, windy and/or cold conditions (when frogs reduce activity) should be avoided.

Data analysis

Based on above survey methods, compare frog occupancy data of pre-construction (if available), control and impact sites, ensuring:

- Observed occupancy decline <20% in impact vs control sites, OR
- No significant change from baseline/control ($p \leq 0.05$), with enough replicates for statistical analysis, in impact vs control sites.

Reporting

Threatened frog occupancy monitoring will be summarised in the BMP Monitoring Report, including the following:

- Details of monitoring methods.
- Results and observations – aural visual survey data.
- Discussion/interpretation of impacts – comparison of control and impact monitoring data to:
 - Identify decline in occupancy.
 - Investigate potential causes, HLW-related or otherwise.
 - Investigate consequence of impacts on target frogs.
- Adaptive management (per the below).

Annual BMP Monitoring Reports will be provided to CPHR, NPWS, FCNSW and DCCEEW as soon as they are available.

Adaptive management

- Initial investigation to document potential causation between decline and HLW construction related impacts.
- Development of a mitigation plan in consultation with NSW DCCEEW Environment and Heritage, addressing causes of decline as determined in initial investigation. This may include increased monitoring or additional construction-related mitigation measures.
- If this is ineffective, additional offsets may be required.

Table 4-10 Threatened frog habitat monitoring

Threatened Frog Habitat Monitoring	
Objective and target	
Monitor potential frog habitats within and adjacent to the HLW Area and document any changes arising from HLW. Targets for monitoring include: • Impact sites retain at least 80% of key microhabitat features (e.g., ground cover, vegetated edge, water retention, shelter objects) post-construction and compared to control sites. • No measurable increase in sedimentation or loss of water-holding capacity in >10% of impact sites. • No measurable increase in weed cover or decrease of native vegetation cover in >10% of impact sites.	
Location and sampling units	
Frog monitoring sites correlate with occupancy habitat sites detailed in Table 4-9 and shown in Figure 4-2, including control (i.e., upstream) and impact locations (i.e., downstream).	
Method	
Before-After-Control-Impact (BACI) monitoring as detailed below. A Rapid Aquatic Assessment (RAA) modified from the Australian River Assessment System methodology (Parsons et al., 2002) is to be completed at each monitoring site, comprising a 50 m transect. The start and end points of each 50 m transect are to be physically demarcated to ensure repetition of monitoring events. Photographs are to be taken of each start and end point at an approximate height of 1.5 m. A horizontal field of view of approximately 40° is to be achieved for the central angle of view for human vision (i.e., 40-60°). The following aquatic assessments are to be conducted at each transect:	

Threatened Frog Habitat Monitoring

- Stream condition:
 - Flow width (m) averaged from set distance along the stream (5 m, 15 m, 25 m, 35 m, 45 m).
 - Max flow width (m).
 - Min flow width (m).
 - Soil moisture $\pm 3\%$ volumetric water content averaged from set distance along the stream (5 m, 15 m, 25 m, 35 m, 45 m).
 - Clarity/sediment load (0 [no clarity] – 5 [clearest]), and
 - Erosion (0 [no signs of erosion] – 5 [severe]).
- Stream flow type:
 - Pooling.
 - Flowing.
 - Continuous.
 - Discontinuous, or
 - Riffles.
- Aquatic vegetation type:
 - Submerged.
 - Floating, or
 - Emergent.
- Substrate type:
 - Bedrock.
 - Boulder (>256mm).
 - Cobble (64-256mm).
 - Pebble (16-64mm).
 - Gravel (2-16mm).
 - Sand (0.06-2mm), or
 - Clay/Silt (<0.06mm).
- Bank slope:
 - Flat <10°.
 - Low 10 – 30°.
 - Moderate 30 – 60°.
 - Steep 60 – 80°, or
 - Vertical 80 – 90.

This riparian assessment is to be supplemented by photo monitoring points and plot-based vegetation monitoring to be completed in an established 20 x 20 m plot (or 400 m² equivalent for linear areas) within the vegetated riparian corridor. Each plot must be assessed in accordance with composition and structure plot guidelines listed in the BAM 2020.

Timing, effort and frequency

At least one monitoring event should be undertaken prior to, or soon after commencement of construction works (within 6 months of construction works commencing). Ongoing monitoring will occur annually during construction works (in spring).

Data analysis

Based on above survey methods, compare frog habitat data of pre-construction (if available), control and impact sites, ensuring:

- Impact sites retain at least 80% of key microhabitat features (e.g., ground cover, vegetated edge, water retention, shelter objects) post-construction and compared to control sites.
- No measurable increase in sedimentation or loss of water-holding capacity in >10% of impact sites OR significant change from baseline ($p \leq 0.05$) with enough replicates.
- No measurable increase in weed cover or decrease of native vegetation cover in >10% of impact sites. No significant change from baseline/control ($p \leq 0.05$), with enough replicates for statistical analysis, in impact vs control sites OR significant change from baseline ($p \leq 0.05$) with enough replicates.
- Observed increase <25% with RAA results (accounting for observer bias).

Threatened Frog Habitat Monitoring

Reporting

Threatened frog habitat monitoring will be summarised in the BMP Monitoring Report, including the following:

- Details of monitoring methods.
- Results and observations – BAM plot and RAA data.
- Discussion/interpretation of impacts – comparison of control and impact monitoring data to:
 - Compare changes in key microhabitat features (e.g., ground cover, vegetated edge, water retention, shelter objects).
 - Compare changes in sedimentation.
 - Compare changes in native vegetation and weed cover.
 - Investigate potential causes, HLW-related or otherwise.
 - Investigate consequence of impacts on target frog habitats.
- Adaptive management (per the below).

Annual BMP Monitoring Reports will be provided to CPHR, NPWS, FCNSW and DCCEEW as soon as they are available.

Adaptive management

- Initial investigation to document potential causation between decline and HLW construction related impacts.
- If the result of a HLW related event, corrective actions to address further impacts, and an assessment of whether remediation of the waterway/riparian corridor is required, undertaken in consultation with NSW DCCEEW Environment and Heritage.
- Ongoing monitoring to determine if corrective actions have addressed the impact and avoided long-term impacts.
- If this is ineffective, additional offsets may be required.

4.6. TEC monitoring

TEC monitoring is detailed in Table 4-11 below.

Table 4-11 TEC monitoring

TEC Monitoring
Objective and target Ensure Montane Peatlands and Swamps / Alpine Sphagnum Bogs and Associated Fens located within no-go zones remain free from direct and indirect construction-related impacts, and maintain ecological condition throughout the construction phase. Targets for monitoring include: - No observable changes in floristic composition, structure or condition. - No increase in weed cover (>5%), physical disturbance or erosion indicators over baseline levels.
Location and sampling unit The location of TEC will be within no-go zones relevant to Montane Peatlands and Swamps / Alpine Sphagnum Bogs and Associated Fens (PCT 637), as displayed in Section 4.7. Sampling units will be limited to one to avoid any monitoring-related impacts to the community.
Method Before / After clearing monitoring as detailed below. Photo monitoring points and plot-based vegetation monitoring to be completed in an established 20 x 20 m plot (or 400 m² equivalent for linear areas). Assessed in accordance with composition and structure plot guidelines listed in the BAM 2020.
Timing, effort and frequency Monitoring points will be established prior to the commencement of clearing to establish baseline metrics. These would be documented in Pre-clearing Reports or BMP Monitoring Reports. The first post-clearing monitoring event should occur within three months of the commencement of clearing at the nominated monitoring site. Follow-up monitoring would then occur annually thereafter through construction.
Data analysis Based on above survey methods, compare vegetation monitoring data of baseline (including Revised BDAR data) and impact sites, ensuring: - No observable changes in floristic composition, structure or condition OR no significant change from baseline/control ($p \leq 0.05$), with enough replicates for statistical analysis. - No increase in weed cover (>5%), physical disturbance or erosion indicators over baseline levels.

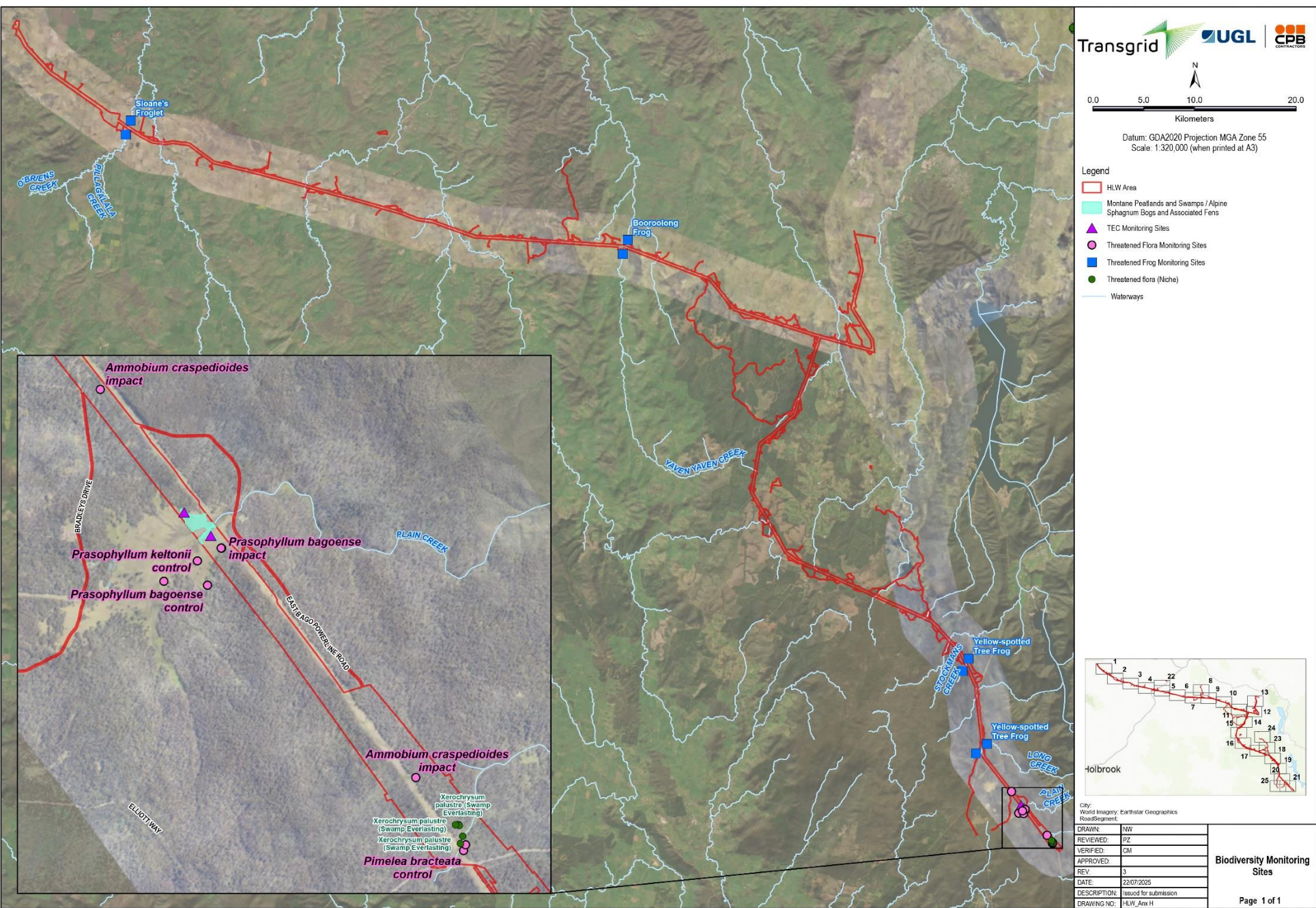
TEC Monitoring
Reporting
TEC monitoring will be summarised in the BMP Monitoring Report, including the following: • Details of monitoring methods. • Results and observations – BAM plot monitoring of floristics, associated vegetation integrity score. • Compliance assessment: ◦ Tracking of vegetation integrity scores against baseline data. ◦ Comparison of post-clearing floristic species richness and cover by growth form type for native species with pre-clearing data and Revised BDAR data to identify any losses or gains in native species composition. ◦ Comparison of post-clearing cover and species richness for exotic flora species compared with pre-clearing data and Revised BDAR data to identify any weed introductions or increases to exotic flora species cover. ◦ Confirmation of compliance with clearing requirements and reporting on any excessive clearing. ◦ Investigation of potential causes, HLW-related or otherwise • Adaptive management (per the below). Annual BMP Monitoring Reports will be provided to CPHR, NPWS, FCNSW and DCCEE as soon as they are available.
Adaptive management
• Initial investigation to document potential causation between decline and HLW construction related impacts. • If the result of a HLW related event, corrective actions to address further impacts, and an assessment of whether remediation of the TEC is required, undertaken in consultation with NSW DCCEE Environment and Heritage. • Ongoing monitoring to determine if corrective actions have addressed the impact and avoided long-term impacts. • If this is ineffective, additional offsets may be required.

4.7. Monitoring sites

Monitoring sites have been developed as part of this strategy based on Revised BDAR data, as displayed in Figure 4-2. This includes:

- Control and impact sites for threatened flora monitoring – *Ammobium craspedioides*, *Pimelea bracteata*, *Prasophyllum bagoense*, *Prasophyllum keltonii* and *Xerochrysum palustre*.
- Control and impact sites for threatened frog monitoring – Sloane's Froglet, Yellow-spotted Tree Frog and Booroolong Frog.
- Monitoring site for Montane Peatlands and Swamps / Alpine Sphagnum Bogs and Associated Fens (PCT 637 no-go zone).

Additional monitoring sites will be added if pre-clearing surveys or biodiversity verification reporting identify additional locations of target flora (within 30 m of disturbance zones), fauna or TECs, and will be subject to the monitoring program detailed in Section 4.



5. References

- Australian Museum (2022) *Discover & Learn*. Retrieved from: <https://australian.museum/>
- DCCEEW – Cth (2014). Draft survey guidelines for Australia's threatened orchids. Retrieved from: <https://www.dcceew.gov.au/environment/epbc/publications>
- DCCEEW – Cth (2010a). *Survey guidelines for Australia's threatened birds*. Retrieved from: <https://www.dcceew.gov.au/environment/epbc/publications>
- DCCEEW – Cth (2010b). *Survey guidelines for Australia's threatened frogs*. Retrieved from: <https://www.dcceew.gov.au/environment/epbc/publications>
- DCCEEW – NSW (2025a). *BioNet Atlas of NSW Wildlife*. Retrieved from: http://www.environment.nsw.gov.au/atlaspublicapp/UI_Modules/ATLAS_/AtlasSearch.aspx?who=ddb86a5f-2881-40ec-b09d-5b2c6ce0d614.
- DCCEEW – NSW (2025b). *BioNet Species Sightings Data*. Retrieved from: <https://www.environment.nsw.gov.au/topics/animals-and-plants/biodiversity/nsw-bionet/about-bionet-atlas/species-sightings-data>
- DCCEEW – NSW (2025c). *Threatened Biodiversity Profile Search*. Retrieved from: https://atlaseditor.bionet.nsw.gov.au/UI_Modules/TSM_/Default.aspx
- DCCEEW – NSW (2024). *Public register of Saving our Species conservation strategies*. Retrieved from: <https://savingourspecies.environment.nsw.gov.au/>
- DPIE (2020a) *Biodiversity Assessment Method 2020*
- DPIE (2020b). *NSW Survey Guide for Threatened Frogs: A guide for the survey of threatened frogs and their habitats for the Biodiversity Assessment Method*
- eBIRD (2025). *Discover a new world of Birding*. Retrieved from: <https://ebird.org/home>
- Niche Environment and Heritage Pty Ltd (2024). *HumeLink Biodiversity Development Assessment Report EIS Technical Report 1 Rev 0*. Version: June 2024
- OEH (2004). *Threatened Biodiversity Survey and Assessment Guidelines: Guidelines for developments and activities (2004 working draft)*.
- Parsons, M., Thoms, M. and Morris, R. (2002). *Australian River Assessment System: AusRivAS Physical Assessment Protocol, Monitoring River Heath Initiative Technical Report 22*, Commonwealth of Australia and University of Canberra, Canberra.

Curriculum Vitae



Polina Zadorojnaya

Senior Ecologist | Team Leader

Role at RPS

Senior Ecologist | Team Leader

Location

Sydney, NSW, Australia

Qualifications

BAM Accredited Assessor (BAAS23014)

Bachelor of Science (Environmental Science), Simon Fraser University, Canada

First Aid Certificate

White Card

RIW Card & Safely Access the Rail Corridor

4WD Training

Why Polina for this role

Polina is a BAM-accredited Ecologist, Senior Ecologist and Sydney Team Leader with extensive experience conducting high-quality ecological assessments within New South Wales. Polina's experience spans across a variety of key industry sectors including State Significant Developments, Part 5 approvals for state and local governments, local Part 4 approvals and large-scale infrastructure.

Polina has been responsible for overseeing projects from inception through to delivery including field surveys, reporting, technical input/review and project management. She is highly experienced in ecological consultation with both proponents and consent authorities to support successful delivery of large-scale development.

Relevant projects

HumeLink West CSSI Transmission Project, HumeLink West Joint Venture (UGL Limited and CPB Contractors), 2024 - ongoing

Polina is currently preparing a Biodiversity Management Plan (BMP) for the construction phase of HumeLink West, a Critical State Significant Infrastructure (CSSI) 150 km long transmission project linking Snowy 2.0 to the Wagga Wagga Substation. The management plan outlines how construction works will minimise and mitigate impacts to biodiversity values and includes numerous sub-plans such as vegetation clearing protocols, a connectivity strategy and a hollow and nest strategy.

Coonerang Wind Farm, Someva Renewables, 2023 - ongoing

Polina is a Senior Ecologist for the Coonerang Wind Farm, a State Significant Development in the Southern Tablelands. Responsible for the management and delivery of ecological constraints assessments to guide strategic design, Biodiversity Development Assessment Report including thorough vegetation integrity plots, analysis, targeted threatened flora and fauna surveys, EPBC Act Referral process, Bird and Bat Utilisation Surveys and Collision Risk Modelling. Leading consultation with consent authorities including DPE, DCCEEW, BCD, BCS, DPI, and threatened species experts for Grassland Earless Dragons and various other target species.

Solar Farm and BESS, Samsung C&T Renewable Energy Australia, 2024 - ongoing

Polina is managing the delivery of all biodiversity components (Scoping Stage and EIS) for a Solar Farm and BESS in the Southeastern Highlands. Tasks include a Preliminary Biodiversity Assessment Report (PBAR) to support the request for SEARs, BAM plots, large-scale vegetation mapping, targeted species surveys and preparation of BDAR and EPBC Act Referral in accordance with SEARs and relevant legislation and guidelines.

Biodiversity Assessment Reports (Part 4)

Solar Farm and BESS, M Renewables Australia Developments Pty Ltd, 2024 - ongoing

Polina is managing the delivery of all biodiversity components (Scoping Stage and EIS) for a Solar Farm and BESS in north-eastern NSW. Tasks include an Ecological Constraints Assessment to guide detailed design, Preliminary Biodiversity Assessment Report (PBAR) to support the request for SEARs, BAM plots, large-scale vegetation mapping, targeted species surveys and preparation of BDAR and EPBC Act Referral in accordance with SEARs and relevant legislation and guidelines.

Appin (Part) Precinct Development, Walker, 2023 - ongoing

Polina is the Senior Ecologist for a staged development of Appin (Part) Precinct, including provision of Biodiversity Assessment Report, Vegetation Management Plan, Weed Eradication Plan and Biodiversity Development Assessment Report. Ensuring consistency with local legislation including the Cumberland Plain Conservation Plan, and ongoing consultation for the staged development over 1,200 hectares.

Wilton Town Centre Precinct, APP, 2024 - ongoing

Polina is the Senior Ecologist for Wilton Town Centre Precinct development including employment lands, a major town centre, infrastructure, residential dwellings and environmental conservation lands. The ecological scope of works involves the preparation of a Survey Gaps Analysis, Ecological Constraints Assessment to guide project design, Conservation Land Strategy, Ecological Assessment Report, Biodiversity Development Assessment Report, Vegetation Management Plan, Koala Assessment Report and CPCP Consistency Assessment.

Mulwala Solar Farm Modification, OX2, 2023-2024

Polina supported the modification application for the SSD Mulwala Solar Farm. This included vegetation mapping and field surveys in line with the BAM, offset calculations, Ecological Consistency Assessments and an EPBC Act Referral.

Macarthur Business Park, Walker, 2023 - ongoing

Polina is the Senior Ecologist for the Macarthur Business Park Planning Proposal in the Wollondilly Shire Council LGA. Her services have included the preparation of an Ecological Constraints Assessment to support the Scoping Proposal, large-scale vegetation mapping, targeted surveys and a Biodiversity Assessment Report to support the Planning Proposal.

Industrial Development, Various Reports, 2023-2024

Polina was the Senior Ecologist for an Industrial Development in the Parramatta LGA. She prepared all ecological surveys and documentation to support the DA, including Biodiversity Development Assessment Report, Vegetation Management Plan, and Foreshore Capping Assessment.

Large 6-lot Subdivision, Biodiversity Development Assessment Report, 2022*

Polina prepared a Biodiversity Development Assessment Report for a large 6-lot residential subdivision in Shoalhaven NSW. This involved intensive fieldwork and targeted surveys as per Stage 1 and 2 of the BAM 2020.

Biodiversity Development Assessment Report, Private Landowner, 2023*

Polina was engaged to produce a Biodiversity Development Assessment Report (BDAR) for a private developer in Catherine Field.

Biodiversity Development Assessment Report, Private Developer, 2023*

Polina was engaged to produce a Biodiversity Development Assessment Report (BDAR) for a private developer in the Blue Mountains.

Ecological Constraints Assessment, State Significant Development, 2023*

Polina prepared an Ecological Constraints Assessment and ongoing support for a State Significant Warehouse Development in Western Sydney. The assessment included Stage 1 of the Biodiversity Assessment Method, including vegetation integrity plots, high-level vegetation mapping and identification of threatened flora species. This assessment was incorporated into the master plan of the development, improving likelihood of environmental approval with minimal environmental impact.

Review of Environmental Factors (Part 5)

Valley View Wetland REF, Northern Beaches Council, 2022 - 2023

Polina was engaged by Council for the project management and delivery of an REF to support the construction of an artificial wetland within Warriewood.

Heath Road Upgrade REF, Liverpool City Council, 2023

Polina was responsible for the delivery of an REF to support the upgrade of Heath Road for Liverpool City Council.

Shanes Park Reserve FAFT Program, Review of Environmental Factors, National Parks and Wildlife Service, 2022*

Polina was responsible for the preparation of a Fire Access and Fire Trail (FAFT) Program Review of Environmental Factors (REF) for the upgrade of over 50km of fire trails within Shanes Park Reserve. The assessment included high-level vegetation mapping, identification of threatened flora and re-positioning of fire trail assets to yield the least environmental impact possible.

Heath Road Upgrade, Review of Environmental Factors, Liverpool City Council, 2023*

Polina was responsible for the delivery of an REF to support the upgrade of Heath Road for Liverpool City Council.

Hazard Reduction Burns, Review of Environmental Factors, Northern Beaches Council, 2023*

Polina prepared an REF to support hazard reduction burns within 5 Northern Beaches Council reserves. This involved assessment of neighbouring Littoral Rainforest and Powerful Owl breeding habitat, and relevant avoidance measures.

Castle Rock and Taylors Bay Tracks, Review of Environmental Factors, NPWS, 2023*

Polina was responsible for the delivery of an REF to support trail upgrade works for Castle Rock and Taylors Bay within the Sydney Harbour National Park, including targeted surveys for microbats.

Valley View Wetland, Review of Environmental Factors, Northern Beaches Council, 2022-2023*

Polina was engaged by Northern Beaches Council for the project management and delivery of an REF to support the construction of an artificial wetland within Warriewood.

Reef Beach Amenities Building, Review of Environmental Factors, NPWS, 2022*

Polina prepared of an REF to support the upgrade of the Reef Beach Amenities Building within Sydney Harbour National Park, including engagement with Aboriginal Heritage consultants.

Shanes Park Reserve FAFT Program, Review of Environmental Factors, NPWS, 2022*

Project management and delivery of a FAFT Program Review of Environmental Factors (REF) for the upgrade of over 50km of fire trails within Shanes Park Reserve. This involved identification and targeted avoidance of three Threatened Ecological Communities and over 300 threatened flora individuals.

Burrinjuck FAFT Program, Ecological Impact Assessment, NPWS, 2022*

Project management and delivery of an Ecological Impact Assessment of over 80km of fire trails to support a FAFT Program Review of Environmental Factors (REF) within Burrinjuck Nature Reserve. This included high-level vegetation mapping and identification/avoidance of threatened flora and fauna habitats.

Mt Kaputar FAFT Program, Review of Environmental Factors, NPWS, 2021*

Project management and delivery of a FAFT Program Review of Environmental Factors (REF) for the upgrade of over 150km of fire trails within Mt Kaputar National Park.

Joadja Complex FAFT Program, Review of Environmental Factors, Soil Conservation Service, 2021*

Project management and delivery of a FAFT Program Review of Environmental Factors (REF) for the upgrade of over 30km of fire trails in Joadja.

Biodiversity Monitoring

Grassland Critically Endangered Ecological Community Vegetation Surveys, Department of Planning and Environment, 2022*

Polina organised a team of 4 Ecologists to assess 150 vegetation plots within candidate grassland CEECs across central and southern NSW. The survey was commissioned by the Department of Planning and Environment (DPE) and conducted over a 3-week period. These surveys supported the development of the State Vegetation Type Map of NSW.

Bird Surveys at Dee Why Lagoon, Northern Beaches Council, 2023*

Polina undertook seasonal woodland and wetland bird surveys at Dee Why Lagoon for Northern Beaches Council.

Threatened Species Monitoring, MTE Developments, 2023*

Polina undertook Dural Land Snail and Yellow-bellied Glider monitoring following the requirements outlined in a BDAR for a large residential subdivision.

Vegetation Management Plan Monitoring, Private Landowner, 2023*

Development and delivery of Vegetation Management Plan monitoring for a local landowner in West Pennant Hills.

Western Sydney Airport *Pimelea spicata* monitoring, CPB Contractors Lendlease Joint Venture, 2021-2022*

Polina undertook seasonal monitoring of translocated *Pimelea spicata* individuals, as well as soil translocation areas including parallel transects and Vegetation Integrity Plots.

Koala Assessment Report and Vegetation Management Plan Monitoring, Local Landowner, 2022*

Monitoring of management actions outlined in a Koala Assessment Report and Vegetation Management Plan, including Vegetation Integrity Plots and targeted surveys for Koalas.

Weed Monitoring, Lendlease, 2022*

Seasonal weed monitoring and reporting of all weed species, densities and recommended treatment along the entire length of the M7 Westlink.

Management Plans

Environmental Management Plan, Allambie Heights Village, 2023*

Polina prepared an Environmental Management Plan for the Allambie Heights Retirement Village, in consultation with an Aquatic Ecologist, to ensure the ongoing protection of the locally important Climbing Galaxias (*Galaxias brevipinnis*).

Vegetation Management Plan, Private Landowner, 2022*

Project management of a Vegetation Management Plan for a local landowner in Northbridge.

Vegetation Management Plan, Private Landowner, 2022*

Project management and delivery of a Vegetation Management Plan for a local landowner in Terrigal.

Rehabilitation Vegetation Management Plan, Private Landowner, 2022*

Delivery of a Rehabilitation Vegetation Management Plan in response to illegal clearing of Cumberland Plain Woodland in Western Sydney.

Vegetation Management Plan, Private Landowner, 2022*

Project management and delivery of a Vegetation Management Plan for a local landowner in Bulla.

Vegetation Management Plan, Private Landowner, 2021*

Polina prepared a Vegetation Management Plan for a local landowner in Wahroonga.

Other Specialist Experience

Post-Approval Ecologist Works, Western Sydney Airport- Bulk Earthworks, CPB Contractors Lend Lease Joint Venture, 2019-2023*

Polina conducted various Project Ecologist services over large areas, including nest box monitoring, dam dewatering, pre-clearing surveys, clearing supervision and targeted threatened species surveys for the development of the Western Sydney Airport. All works were conducted in accordance with approved environmental controls, adequately addressing all management requirements.

**Projects undertaken with previous employer*

Curriculum Vitae



Chris Wellington

Practice Leader - Ecology

Role at RPS

Practice Leader - Ecology

Location

Newcastle, NSW, Australia

Qualifications

Graduate Certificate in Research - UTAS

Bachelor of Advanced Science (Hons1) Marine & Terrestrial Ecology - UNSW

Statistical Analysis using R (course)

Advanced Analytical Techniques (UPLC-MS, NIR)

Certificate III Micro-Business

Bushfire Protection & Prone Areas Management & Design

Rail industry Worker Certificate

NSW White card

Coal Order 43 Medical

Advanced 4WD and recovery

Rescue Scuba Diver

Why Chris for this role

Chris has over 20 years' experience in the environment field in both the public and private sectors. This includes managing projects with large budgets and teams with varied disciplines to achieve outcomes that benefit the environment. As RPS' Ecology Practice Lead, Chris manages a team of 14 ecologists including staff accredited as Biodiversity Assessment Method (BAM) assessors.

Chris' areas of expertise include terrestrial and aquatic ecological assessment, environmental management, impact assessment, environmental approvals, land management, ecological restoration, environmental monitoring, vegetation management plans, waterway health assessment, stormwater treatment, and water sensitive urban design.

Relevant projects

Coonerang Onshore Wind Farm, Someva (Confidential Client), 2023 - present

Chris is currently overseeing RPS Senior Ecologists delivering the SSD, BDAR, EPBC Act Referral, BBUS surveys and collision risk modelling for the Coonerang Onshore Wind Farm.

New England Onshore Wind Farm, Origin, 2024 - present

Chris is currently co-managing with RPS Senior Ecologists to deliver the SSD BDAR, EPBC Act Referral, BBUS surveys and collision risk modelling for the New England Onshore Wind Farm.

Novocastrian Novocastrian Offshore Wind Farm, Oceanex, 2023

Chris oversaw RPS' team of Ecologists to establish a baseline studies strategy for the proposed Novocastrian Offshore Wind Farm in the Hunter Offshore Wind Zone.

Temperate Highland Peat Swamp on Sandstone (THPSS) Monitoring, Springvale and Angus Place, Centennial Coal, 2023

Report review/standardisation and PM mentoring for assessment of Endangered Ecological Communities within the Newnes Plateau and surrounding areas for the Springvale and Angus Place underground mines. These extensive long-term projects include nested transects, floristic quadrats, annual swamp transects and ground truthing of remotely sensed imagery.

Angus Place LW 920-980 Swamp Flora Monitoring, Centennial Coal, 2023

Report review/standardisation for this monitoring program, which includes seasonal field flora quadrats and associated reporting of potential impacts to an Endangered Ecological Community. Annual reports include comparisons between plots and seasons with similarity matrices and Non-metric Multi-dimensional Scaling using PRIMER-e.

Relevant projects

Springvale Blue Mountains Water Skink Monitoring, Centennial Coal, 2023

Report review, PM mentoring and assistance with field work for this project which assesses the population dynamics of Blue Mountains Water Skink (*Eulamprus leuraensis*) within swamps of the Newnes Plateau, to determine impacts of mining on their habitat. This project included funnel trapping, animal handling and assessment, and DNA collection.

Telecommunications tower upgrades, Visionstream/Ventia, 2023

Report review and PM mentoring for Flora and Fauna Assessment Reports for telecommunications tower upgrades at multiple locations in NSW. Potential impacts to ecosystems and threatened species were assessed for the construction of access tracks, towers and associated facilities.

Mandalong Land Management Strategy, Centennial Coal, 2023

Report review/standardisation and PM mentoring of LMS strategy for the Mandalong Mine.

Warragamba Dam Raising EIS review, SMEC, 2022

Chris undertook the revision and re-calculation of biodiversity offset credits for upstream impact area in response to NSW Environment and Heritage comments.

Multiple Bridge Upgrade REFs NSW, Country Rail Network (CRN), 2022

Provision of Biodiversity Assessment Reports to inform the REFs for multiple bridge upgrades.

Jacka Watermain Connection EIA and Environmental Significance Opinion (ESO) ACT, Suburban Land Agency (SLA), 2022

Chris provided an assessment of EPBC Act listed Threatened Ecological Community conditions and likely impact of proposed Jacka Reservoir watermain connection from the Jacka Estate to the Jacka Reservoir North of Bonner, ACT as required for the security of water supply for the Gungahlin Area.

Penrith Ecological Due Diligence Assessment (EDDA), Ventia Services Group, 2022

Chris provided EDDA and associated environmental investigations to determine the level of impact associated with the location and upgrade of Telstra manholes. The project was undertaken in accordance with the Telecommunications (Low-impact Facilities) Determination.

Environmental Auditing and Management, Department of Transport & Main Roads, 2013-2014

Chris undertook audits and provided advice regarding environmental assessment and management requirements in relation to planning, design, construction and/or maintenance projects to internal and external stakeholders.

Water Quality Systems Design and Construction, Gold Coast City Council, 2011 - 2013

Chris was Team Leader responsible for management, design, and monitoring for all Gold Coast City Council environmental compliance construction projects. This included development and design of innovative WSUD systems that included wetlands, bioretention systems, floating reed beds, rain gardens, GPTs, commercial filtration devices, trash racks, vegetated swales, and riparian revegetation.

Foreshore Asset Management, Gold Coast City Council, 2009 - 2011

Management of foreshore asset portfolio and construction including all foreshores, foreshore structures (e.g., boat ramps, jetties, breakwalls), navigable waters (including dredging permits), land management, marine water environments, protection of vegetation and dune systems, and waterway tourism along tidal waterways including canals, creeks, rivers and harbours.

Waterway Health Enhancement Program, Brisbane City Council, 2005 - 2009

Schedule 80 Waterway Health Enhancement Program

Management of a team of design engineers, environmental project managers, hydrologists, water quality modellers, and external contractors for design, construction, management and monitoring of both hard and soft engineering solutions (including WSUD) to improve whole of catchment waterway health. Yearly design budget of \$600K and yearly construction budget of \$5-7 million.

Prioritisation of Waterway Health Enhancement (WHE) Projects

Designed and applied new Triple Bottom Line assessment and developed prioritisation methodology for future application.

Aquatic Conservation Assessment of Brisbane's Waterways

Collaboration between BCC and the Queensland EPA. Conduct an Aquatic Conservation Assessment of Brisbane's waterways (both estuarine and riverine) using the AquaBAMM methodology developed by the EPA. Collation of data for

approximately 80 measures of ecological value and condition from both existing data sources and expert panel workshops.

Rochedale Stormwater Monitoring Project

Monitoring before, during and after the life of a large Masterplan development to investigate of the effectiveness of WSUD technologies in an urban development.

Other Projects 1999 - 2014

- Reedy Creek Interchange Review of Environmental Factors, Dept. of Main Roads
- Broad Scale Vegetation Assessment, 1400 Ha Property, Flagstone - Beaudesert
- Development Application Ecological Impact Assessment, Wakerley
- Development Application Greenspace Report, Byng Road, Birkdale
- Development Application Bushfire Hazard Assessment, Campbells Pocket.
- Benthos Survey, Lake Macquarie NSW
- Seagrass Survey of Lake Macquarie NSW
- Flora and Fauna Study, Wategos Beach, Byron Bay, NSW
- Agricultural Buffer Zone Assessment, Mullumbimby, NSW
- Recreational Use Survey, Brunswick River, NSW
- Flora and Fauna Assessment, Kurnell, NSW
- Soil Contamination Assessment, subdivision proposal, Mullumbimby, NSW
- Environmental Impact Assessment / Bushfire Risk Assessment Report, 10 Lot Subdivision, Byron Bay, NSW
- Private Property Environmental Management Program, Northern NSW
- Wollondilly Local Environment Study, NSW
- Canal Estate Seagrass Transplantation, Port Macquarie, NSW
- Riparian Zone Rehabilitation, Turella, NSW
- Australia Post Site Rehabilitation, Rockwood, NSW
- Bushland Regeneration, Claireville, NSW
- Moreton Bay Regional Council (MBRC) – Solander Drain Rehabilitation, QLD
- Bushfire Hazard Assessment and Vegetation Management Plan, Emu Park QLD
- Queensland Water Commission (QWC) Water Efficiency Management Plans
- National Pollutant Inventory Reporting for Energex and Wesley Hospital, QLD
- Quarry Water Management Plan and Stormwater Concept Plan, Beerburrum, QLD
- Allstate Roads Asphalt Plant Noise and Air Quality Assessment, Inverell, QLD
- Redesign of Sewage Treatment Plant, Sunwater, QLD
- Detailed Ecological Site Assessment, Upper Coomera, QLD
- Regional Ecosystem (RE) Map Change Request, Gladstone QLD

Curriculum Vitae



Tara Boreham

Senior Ecologist - Team Leader

Role at RPS

Senior Ecologist - Team Leader

Location

Newcastle, NSW, Australia

Qualifications

BAM Accredited Assessor (BAAS23039)

Bachelor of Science (Chemistry; Biology), Macquarie University

Graduate Certificate in Ornithology, Charles Sturt University

Certificate IV in Design

First Aid Certificate

White Card

Coal Order 43 Medical

Rail Industry Worker

RIIVEH305E Operate and maintain a four wheel drive vehicle

Why Tara for this role

Tara is terrestrial ecologist and BAM accredited assessor with extensive experience conducting high quality biodiversity assessments across NSW. She has in depth knowledge of NSW State and Commonwealth legislation including the *Biodiversity Conservation Act 2016* (BC Act) and *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and is passionate about flora and fauna management.

Tara has been responsible for overseeing projects from inception through to delivery including desktop research and literature review, coordinating and conducting flora and fauna field surveys, scientific reporting, vegetation mapping, statistical data analysis, biodiversity offset calculation and strategies, and project management.

Relevant projects

Wind Farm, Scoping Report and Biodiversity Development Assessment Report, 2024 - ongoing

Tara is the BAM assessor for an ongoing State Significant Wind Farm Development in the New England Renewable Energy Zone. Tara is assisting with the delivery the Scoping Report and Biodiversity Development Assessment Report including coordination of targeted flora and fauna surveys, implementation of baseline Bird and Bat Utilisation Surveys in accordance with the latest national guidelines stakeholder advice, vegetation integrity plots, Plant Community Type and Threatened Ecological Community mapping and analysis, targeted threatened flora and fauna surveys, EPBC Act Referral process, and Collision Risk Modelling.

Battery Energy Storage System, Ecological Constraints Assessment, Scoping Report and Biodiversity Development Assessment Report, 2024 - ongoing

Tara provided technical review and advice for the Ecological Constraints Assessment for two potential BESS sites in the Southern Tablelands. Following preferred site selection, Tara is assisting with the delivery the Scoping Report and Biodiversity Development Assessment Report including coordination of targeted threatened flora and fauna surveys, EPBC Act Referral process, vegetation integrity plots and reporting.

Wind Farm, Ecological Constraints Assessment Report, 2025 - ongoing

Tara is supporting an Ecological Constraints Assessment for a potential State Significant Wind Farm Development in the New England Renewable Energy Zone. Responsibilities include the delivery the Ecological Constraints Assessment Report to determine viability of the selected location for a Wind Farm. This included high level vegetation mapping, desktop assessments and assessments of State and Commonwealth listed threatened entities, to provide risk based advice pertaining to biodiversity.

Relevant projects

Biodiversity Assessment Reports (Part 4)

Battery Energy Storage System – Lennox Head, Ecological Constraints Assessment, 2024

Tara provided technical review and advice for the Ecological Constraints Assessment for a BESS site, associated cabling and access at Lennox Head. This including identifying State and Commonwealth listed entities, and providing preliminary advice on impact avoidance and minimisation based on site values.

Wind Farm, Biodiversity Development Assessment Report, 2023 - ongoing

Tara is supporting an ongoing State Significant Wind Farm Development in the Southern Tablelands. Tara is assisting with the delivery the Biodiversity Development Assessment Report through fieldwork including, vegetation integrity plots, constraints mapping, targeted threatened flora and fauna surveys, Bird and Bat Utilisation Surveys and Collision Risk Modelling and analysis and interpretation of results.

HumeLink West CSSI Transmission Project, Biodiversity Management Plan, HumeLink West Joint Venture (UGL Limited and CPB Contractors), 2024 - ongoing

Tara has been involved with input and technical review of the post-approval Biodiversity Management Plan (BMP) for the construction phase of HumeLink West. The project is a Critical State Significant Infrastructure (CSSI) 150 km long transmission project linking Snowy 2.0 to the Wagga Wagga Substation. The management plan outlines how construction works will minimise and mitigate impacts to biodiversity values, and includes numerous sub-plans such as vegetation clearing protocols, a connectivity strategy and a hollow and nest strategy.

Wind Farm Ecological Advice, Private Client, 2023

Tara has been the lead Ecologist providing third party ecological advice, technical report review and biodiversity offset estimates for a windfarm in the South West Renewable Energy Zone.

Anna Bay Biodiversity Assessment Report, Private Client, 2023 - 2024

Tara was the senior ecologist for a housing development in the Port Stephens Local Government Area. Tara is responsible for delivery the Biodiversity Development Assessment Report, with a focus on avoidance, minimisation and mitigation of impacts to biodiversity values. Tara has conducted thorough vegetation integrity plots, analysis, targeted threatened flora and fauna surveys (including koala detection dogs).

Mulwala Solar Farm, Biodiversity Development Assessment Report and EPBC Act Referral, 2023 - ongoing

Tara is providing technical review and assistance for the State Significant Mulwala Solar Farm Modification in the Southern NSW. Tara has assisted with an EPBC Act Referral as well as the Biodiversity Development Assessment Report (BDAR) with supporting vegetation integrity plots, analysis, and targeted threatened flora and fauna surveys.

Anna Bay Biodiversity Constraints Assessment, Private Client, 2022

Tara was responsible for the project management, flora and fauna fieldwork coordination (including koala detection dogs), scientific report writing and delivery of a biodiversity constraints assessment consistent with the BAM methodology for 150 hectares in Port Stephens. Tara identified areas of outstanding biodiversity values and provided guidance on areas most viable for development. Offset calculations (BAM-C) and the potential for Serious and Irreversible Impacts (SII) impeding approval process were also considered.

Biodiversity Development Assessment Report, Centennial Coal Angus Place West, 2021 - ongoing

Tara was responsible for undertaking ecological investigations as according to the Biodiversity Assessment Methodology to inform a Biodiversity Development Assessment Report. Tara was responsible for field works, data management, plant identification and vegetation mapping.

Targeted surveys, Centennial Coal, 2019 - 2020

Tara undertook targeted flora and fauna surveys for for a proposed mine expansion within the Lake Macquarie Local Government Area.

Biodiversity Development Assessment Report, Private Landowner, 2020*

Provision of a Biodiversity Development Assessment Report (BDAR) for private development in Allambie Heights.

Georges River FFIA, Private Client, 2020*

Tara was engaged for the provision of a Flora and Fauna Impact Assessment (FFIA) for a development adjacent to the Georges River in the Canterbury-Bankstown LGA.

International Centre of Training Excellence FFIA, Blacktown City Council, 2020*

Tara undertook a Flora and Fauna Impact Assessment (FFIA) for the International Centre of Training Excellence at the Blacktown International Sports Park.

Biodiversity Assessment Reports (Part 5)

Central Coast NBN Flora and Fauna assessment, Ventia, 2024

Tara provided technical review and preparation of several Flora and Fauna Assessments to support vegetation trimming and power pole replacements for aerial NBN cabling on the Central Coast. The assessment included rapid vegetation assessment and identification of threatened flora species.

NSW Telco Authority fibre-optic cable installation for the Sydney – Parkes Path, 2022

Tara provided botanical expertise and legislative review for over 100 km of fibre-optic cable upgrades to support the NBN network from Sydney to Parkes. She was responsible for vegetation mapping, identification of threatened ecological communities and threatened flora. Tara provided guidance on impact avoidance and mitigation measures for sensitive entities.

The Horsley Drive Upgrade, Transport for NSW, 2021

Provision of a Biodiversity Assessment Report to inform the REF for the upgrade of The Horsley Drive, Fairfield.

Waratah West Cliffline Rehabilitation Works, Newcastle City Council, 2021

Provision of a Biodiversity Assessment Report to inform an REF for the rehabilitation of a cliff line in Waratah West.

Fern Creek Rehabilitation Works Warriewood, Northern Beaches Council, 2020*

Report preparation, site survey and mapping for the REF for the creek rehabilitation works and RFS creek crossing upgrades for the Northern Beaches Council. The project encountered a potential significant impact on the threatened Red-crowned Toadlet, therefore recommendations were made to first avoid and minimise impacts.

Centre Trail upgrade REF, NSW National Parks and Wildlife Service (NPWS), 2020*

Provision of a Review of Environmental Factors (REF) for the upgrade of Centre Trail fire trail in Ku-ring-gai Chase National Park.

Medowie Road Flora and Fauna Impact Assessment, Port Stephens Council, 2020*

Tara undertook a flora and fauna impact assessment at Medowie Road in Port Stephens.

Bundeena Drive REF, Sutherland Shire Council, 2020*

Provision of a Review of Environmental Factors (REF) for the reconstruction of a section of Bundeena Drive in the Royal National Park.

Dobroyd Head REF, NSW National Parks and Wildlife Service (NPWS), 2020*

Provision of a Review of Environmental Factors (REF) for the Dobroyd Head walking track upgrade.

Honeymoon Track Upgrade, NSW National Parks and Wildlife Service (NPWS), 2021*

Provision of a Constraints Assessment Report for the works on a popular walking track within the Royal National Park. The purpose of the report is to determine if sensitive features are present warranting the requirement for a Review of Environmental Factors (REF).

Two Creeks Track REF, NSW National Parks and Wildlife Service (NPWS), 2020*

Provision of a Review of Environmental Factors (REF) for the Two Creeks walking track upgrade.

Mustons Road Targeted Surveys, Port Stephens Council, 2020*

Tara undertook targeted Surveys for multiple cryptic threatened species at Mustons Road within the Port Stephens LGA to support a REF.

Biodiversity Management Plans and Monitoring

Newnes Plateau Shrub Swamp EEC Ecological Monitoring, Centennial Coal Springvale, 2019 - 2024

Project management of a long-term monitoring project of a BC Act and EPBC Act listed Endangered Ecological Communities (EEC) across the Newnes Plateau; adjacent to Springvale Colliery. Tasks included flora and fauna monitoring, due diligence, EEC monitoring and biodiversity management planning. Tara is also responsible for data management, coordination of the remote sensing program, mapping and quality assurance for the project.

Mandalong Land Management Strategy, Centennial Coal, 2021 - ongoing

Reporting and review of LMS strategy for the Mandalong Mine, including specialist report reviews, desktop assessment, field investigation, and yearly reporting.

Airly Coal Mine Biodiversity Management Plan Monitoring, Centennial Coal, 2019 - ongoing

Project management of a long-term biodiversity monitoring for BC Act and EPBC Act listed flora and for Airly Coal Mine Flora. Project tasks included

woodland bird surveys, owl surveys, flora plots, threatened flora monitoring, statistical assessment of results, and quality assurance.

Boronia deanei Research and Monitoring Plan, Centennial Coal Springvale, 2021 - ongoing

Project management of a long-term monitoring project of a BC Act and EPBC threatened flora species. Tasks includes deployment of field monitoring teams, statistical analysis of data, scientific reporting and recommendations on management practices.

Cliff Line Zone Extraction Plan Biodiversity Management Plan, Centennial Coal, 2023

Specialist report review, data compilation and desktop assessment to prepare the Biodiversity Management Plan for the extraction area at Mt Hatteras.

Mt Hatteras Extension Plan Biodiversity Management Plan, Centennial Coal, 2021

Specialist report review, data compilation and desktop assessment to prepare the Biodiversity Management Plan for the extraction area at Mt Hatteras.

Clarence 918-920 Biodiversity Management Plan 2023 - ongoing

Provision and review of a Biodiversity Management Plan for BC Act and EPBC Act listed threatened species and ecological communities. Consultation with DCCEEW.

Vegetation Management Plan, private client 2020*

Preparation of a three-year management plan for a private client within Sydney's north shore area aimed at habitat protection and enhancement.

Ecological Bushfire Management Plan, Williamstown and Orchard Hills RAAF, BGIS, 2020*

Preparation of a ecological bushfire management plan and environmental assessment as according to the RFS Bush Fire Environmental Assessment Code.

Vegetation and Heritage Management Plan, BGIS, 2020*

Preparation of a vegetation and heritage management plan for the historical garden at Glenbrook RAAF Base.

Vegetation Management Plan for Johnstons Creek Naturalisation, Diona/Sydney Water, 2020*

Preparation of a five year management plan for the vegetation within and surrounding Johnstons Creek in Annandale including management actions for the

Coastal Saltmarsh Endangered Ecological Community.

Georges River Vegetation Management Plan, Private Client, 2020*

Provision of a Vegetation Management Plan for a development adjacent to the Georges River in the Canterbury-Bankstown LGA.

Cockle Creek catchment monitoring, Office of Environment and Heritage, 2020*

Tara undertook Persoonia Mollis subsp. maxima monitoring within the Cockle Creek catchment.

Biodiversity Action Plan, Waverley Council, 2020*

Provision of a Biodiversity Action Plan for remnant vegetation sites across the Waverly LGA.

Dee Why Lagoon Bird Surveys, Northern Beaches Council, 2019 - 2020*

Tara undertook seasonal woodland and wetland bird monitoring surveys at Dee Why Lagoon for Northern Beaches Council.

Monitoring, MTE Developments, 2019 - 2020*

Tara undertook Dural Land Snail and Yellow-bellied Glider Monitoring at Cattai.

Other specialist experience

Biodiversity study to inform a Local Environment Plan, Georges River Council, 2020

Desktop and field analysis of biodiversity hotspots within the local government area.

Post Fire Habitat Assessment, Centennial Coal, 2019

Tara undertook a Post Fire Habitat Assessment at Newnes Plateau for Centennial Coal.

Various floristic studies and bush regeneration, 2019 - 2020*

Bush regeneration, floristic studies and site monitoring at various sites across the Central Coast, Northern Beaches, Ku-ring-gai and Hornsby Shire LGAs, including works within the Umina Coastal Sandplain Woodland, Coorumbine Creek and ongoing WSUD maintenance.

Kangaroo River surveys, Macquarie University, 2018*

Tara undertook Kangaroo River longitudinal aquatic ecology surveys (AUSRIVA) and a rapid riparian assessment.

** projects undertaken for previous employers*

Curriculum Vitae



Chelsea Tiller

Ecologist

Role at RPS

Ecologist

Location

Sydney, NSW, Australia

Qualifications

Bachelor of Social Science (Human Geography), University of Wollongong, NSW

First Aid Certificate

White Card

Why Chelsea for this role

Chelsea is an Ecologist with extensive experience conducting high-quality ecological assessments within New South Wales. She has worked in all aspects of approvals including flora and fauna identification, GIS mapping, and report writing.

Chelsea's experience spans across a variety of key industry sectors including State Significant Developments, Part 5 approvals for state and local governments, local Part 4 approvals and large-scale infrastructure. She has prepared various reports such as Flora and Fauna Impact Assessments (FFIAs), Review of Environmental Factors (REFs), Ecological Constraints Assessments (ECAs), Biodiversity Assessment Reports (BAR) and Vegetation Management Plans (VMPs).

Chelsea has also undertaken targeted surveys for threatened species, long-term fauna monitoring projects, habitat surveys, and preclearing investigations and clearing supervisions. She has been responsible for overseeing projects from inception through to delivery including field surveys, data management, mapping, and reporting.

Relevant projects

HumeLink West CSSI Transmission Project, HumeLink West Joint Venture (UGL Limited and CPB Contractors), 2024 - present

Chelsea is supporting the delivery of a post-approval Biodiversity Management Plan (BMP) for HumeLink West, a Critical State Significant Infrastructure (CSSI) 150 km long transmission project linking Snowy 2.0 to the Wagga Wagga Substation. Chelsea has contributed to the sub-plans such as the rehabilitation sub-plan to guide the rehabilitation of temporarily disturbed areas during construction works, and the Clearing Protocol sub-plan. Chelsea has contributed in the field to relevant sites with application of the Biodiversity Assessment Method including thorough vegetation integrity plots, analysis, targeted threatened flora and fauna surveys, and is supporting on-ground aquatic habitat assessments to assess potential impacts associated with Key Fish Habitat.

State Significant Development Ecological Constraints Assessment, Origin, 2024

Chelsea prepared an Ecological Constraints Assessment and ongoing support for a State Significant Wind Farm in Central NSW. The assessment included preliminary desktop application of Stage 1 of the Biodiversity Assessment Method, including high-level vegetation mapping and assessment of potential impacts on Threatened Ecological Communities, and threatened flora and fauna species. This assessment was incorporated into the master plan of the development.

Relevant projects

Appin (Part) Precinct Development, Walker Appin Developments Pty Ltd, 2024 - present

Chelsea is an Ecologist for a staged development of Appin (Part) Precinct, including provision of Vegetation Management Plan. Ensuring consistency with local legislation including the Cumberland Plain Conservation Plan, and ongoing consultation for the staged development over 1,200 hectares.

State Significant Development Fatal Flaws Assessment, Origin, 2024

Chelsea contributed to the Ecological Constraints Fatal Flaws Assessment for a State Significant Wind Farm in Central NSW. The assessment included preliminary desktop application of Stage 1 of the Biodiversity Assessment Method, including high-level vegetation mapping and assessment of potential impacts on Threatened Ecological Communities, and threatened flora and fauna species. This assessment was incorporated into the master plan of the development, improving likelihood of environmental approval with minimal environmental impact.

Review of Environmental Factors (REF), Biodiversity Assessment Reports (BAR), Ecological Assessment Reports (EAR), and Conservation Risk Assessments (CRA) (Part 5)

Slope remediation and road infrastructure upgrades REFs and EAR, Transport for NSW and NSW National Parks and Wildlife, 2024*

Chelsea was responsible for the project management for two REFs for the slope stabilisation and road infrastructure upgrade of two sites with the Macquarie Pass National Park, including the management of threatened Scrub Turpentine (*Rhodamnia rubescens*) that was infected with Myrtle Rust.

Beecroft Weapons Range and Peninsula REF, Jibralta on behalf of Australian Defence Force, 2024*

Chelsea was responsible for the project management for an REF required for Beecroft Entry Hut and road upgrade within the Beecroft Weapons Range and Peninsula within Jervis Bay, ACT.

Royal National Park (Bundeena and Yarrowarra Complexes) FAFT Program REFs and EAR, National Parks and Wildlife Service, 2023*

Chelsea was responsible for the preparation of a Fire Access and Fire Trail (FAFT) Program REF and Ecological Assessment Report (EAR) for the upgrade of several km of fire trails within Royal National Park. The assessment included identification of threatened fauna and re-positioning

of fire trail assets to yield the least environmental impact possible.

Termeil Campground CRA, National Parks and Wildlife Service, 2024*

Chelsea was responsible for the delivery of Conservation Risk Assessment (CRA) to support the remediation of flood damaged walking infrastructure within a campground in Meroo National Park, including infrastructure improvements to mitigate impact on threatened shore birds by cyclists.

Termeil Carpark CRA, National Parks and Wildlife Service, 2024*

Chelsea was responsible for the delivery of CRA to support the remediation of flood damaged walking infrastructure within two walking tracks and a carpark within Meroo National Park, including infrastructure improvements to mitigate impact on Leafless Tongue-orchid (*Cryptostylis hunteriana*)

Scaly Bark Complex FAFT Program REF and EAR, Soil Conservation Service, 2023*

Chelsea was responsible for the project management of a FAFT Program REF for the upgrade of the Scaly Bark Complex Fire Trail, Dural, NSW.

North Lawson Complex FAFT Program REF, Soil Conservation Service, 2023*

Chelsea was responsible for the project management of a FAFT Program REF for the remediation of the North Lawson Complex Fire Trail, Blue Mountains LGA, NSW, including preservation of Red-crowned toadlet habitat and TECs.

Perrys Lookdown FAFT Program REF, Soil Conservation Service, 2024*

Chelsea was responsible of the project management of the Perrys Lookdown FAFT REFs for the remediation of Perry Lookdown Fire Trail, Blue Mountains LGA, NSW.

Bunyan and Still Creek FAFT Program REF (x2), Soil Conservation Service, 2024*

Chelsea assisted in the preparation of two FAFT Program REFs for the upgrade of Bunyan Still Creek Fire Trail, Sutherland LGA, NSW.

Rehabilitation of CPW REF, National Parks and Wildlife Service, 2022*

Chelsea was responsible for the preparation of an Edmondson Regional Park REF to support the rehabilitation of Cumberland Plain Woodland.

Various Asset Protection Zones (APZ) REF (x8), Soil Conservation Service 2021-2022*

Chelsea was responsible for the preparation of six REFs for the proposed Asset Protection Zones to provide protection of assets following the 2019

bushfires within the Sydney Basin and Blue Mountains.

Lower Escarpment DRFA and FAFT Program REF and EAR, National Parks and Wildlife Service, 2024*

Chelsea was responsible for the preparation of a Disaster Recovery Funding Allocation (DRFA) and FAFT Program REF for the upgrade of three fire trails within the Illawarra Escarpment State Conservation Area.

Kamay Botany National Park FAFT Program REF and EAR, National Parks and Wildlife Service, 2022*

Chelsea was responsible for the preparation of a and FAFT Program REF for the upgrade of over 50 km of fire trails within the Kamay Botany National Park.

Binda Road upgrade BAR and Minor Works REF, Transport for NSW, 2024*

Chelsea was responsible for the project management and preparation of a BAR and MW REF for the proposed upgrade to Binda Road.

Appin Road intersection and road upgrade BAR, Transport for NSW, 2023*

Chelsea was responsible for the project management and preparation of a BAR for the proposed intersection of St Johns Road and Appin Road, including a tree register and retention of Koala feed and use trees.

Slope remediation works NSW BARs (x3), TfNSW 2024*

Chelsea was responsible for the delivery of three BARs, completed on behalf of Atkins Realis', to support the unstable slope remediation along Putty Road and Bells Line of Road, NSW after impacted by flooding events in 2022-2023.'

Slope remediation works NSW BARs (x5), TfNSW 2022-2024*

Chelsea was responsible for the project management and preparation of five BARs, completed on behalf of BD Infrastructure, to support the unstable slope remediation along Putty Road, NSW after impacted by flooding events in 2022-2023.'

Clarence to Wallerawang Pipeline BAR, NSW Public Works, 2023*

Chelsea was responsible for the preparation of a BAR for 35 km of a proposed water reticulation pipeline between Clarence and Wallerawang (via Lithgow).

Mine Remediation works, Abercrombie Karst Conservation Reserve NSW REF, NSW Department of Planning and Environment, 2023*

Chelsea was responsible for the delivery of an REF to support the remediation of the Mount Gray Mine Complex, including identification of threatened fauna species.

Demolition of structures in Austal REFs (x2), Liverpool Council, 2023-2024*

Chelsea prepared two REFs for the demolition of existing structures within 265 Sixth Ave, and 365 Tenth Ave, Austral, NSW. This involved assessment of remnant TECs, and relevant avoidance measures.

Other relevant biodiversity assessment reports (Part 5)

SRAPC Garie Road rehabilitation, FMP and THRP, ConnectSydney, 2023*

Chelsea was responsible for the delivery of a Fauna Management Plan (FMP) and Tree and Hollow Replacement Plan (THRP) to support the offsetting of trees required to rehabilitate Garie Road, Royal National Park, after a landslip during flooding in 2022-2023. The offsetting of the trees through TfNSW Conservation Fund has been allocated to NSW NPWS Myrtle Rust research within the Royal National Park.

SRAPC Mckell Ave rehabilitation, THRP, ConnectSydney, 2024*

Chelsea was responsible for the delivery of the Tree and Hollow Replacement Plan (THRP) to support the offsetting of trees required to rehabilitate Mckell Ave, Waterfall, NSW after a landslip during flooding in 2022-2023. The offsetting of the trees through TfNSW Conservation Fund has been allocated to NSW NPWS Myrtle Rust research within the Royal National Park.

Ecological investigation and assessment, post-chemical spill Western Sydney, Sydney Water, 2023*

Chelsea was responsible for the management of ecological investigation of a chemical spill that occurred with an area mapped as a TEC, and adjacent to a Biodiversity Offset site within western Sydney, including monitoring of vegetation post-spill.

Ecological investigation and assessment, post-sewerage spill, Sydney Water, 2023*

Chelsea was responsible for the management of ecological investigation of a sewerage spill that occurred within vegetation in a Biodiversity Stewardship site in Sydney, NSW.

Ecological investigation and assessment, water pipeline vent replacement, Sydney Water, 2023*

Chelsea was responsible for the project management of ecological investigation for a water pipeline within Artamon, NSW.

Ecological investigation and assessment, targeting known breeding Powerful Owl, Sydney Water, 2023*

Chelsea was responsible for targeted surveys for the Powerful Owl, prior to commencement of works the conducted-on vent shaft within Lane Cove National Park within Artarmon, NSW.

Ecological investigation and assessment, water pipeline vent shaft painting works, Sydney Water, 2023*

Chelsea was responsible for the management of ecological investigation for a water pipeline within St Ives, NSW.

Biodiversity Assessment Reports (Part 4)

Fauna survey for proposed Biodiversity Stewardship site, Private Developer, 2022*

Chelsea provided assistance with fauna survey, proposed Biodiversity Stewardship Site in Merriwa, NSW.

Fauna survey for proposed rezoning of lots and subdivisions (various locations), Private Developer, 2022-2023*

Chelsea provided assistance with threatened fauna surveys for proposed subdivisions and rezoning of private land at more than eight different locations within Bungendore, Marulan, Goulburn and Mittagong areas NSW.

Biodiversity Monitoring

Targeted fauna surveys, Humelink (Snowy 2.0 Transmission Connection Project), UGL on behalf of Transgrid, 2024*

Chelsea undertook targeted surveys and preclearance surveys for Masked Owl, Yellow-bellied Gliders, Greater Gliders, Squirrel Gliders, and Gang-gang cockatoos following the requirements outlined in a BDAR for the Humelink substation and transmission line between Kosciuszko National Park, Maragle State Forest and Wagga Wagga.

Flora and Fauna investigation and ongoing monitoring of vegetation post-sewerage spill, Sydney Water, 2023*

Chelsea undertook ongoing vegetation transects in monthly intervals to monitor vegetation impacted by a sewerage spill within western Sydney NSW.

Australian White Ibis (Threskiornis molucca) monitoring study, Canterbury-Bankstown Council. 2021-2022*

Chelsea undertook Australian White Ibis monitoring of nesting and roosting behaviour at Six monthly study (at monthly intervals).

Other Specialist Experience

Targeted surveys and vegetation plots, Desert Ecology Research Group

Chelsea assisted with research for the University of Sydney's Desert Ecology Research Group (DERG), including but not limited to fauna surveys targeting Dasyurid species, and vegetation plots and seed collection within the Simpson Desert, on the border of NT/QLD. The reserve is owned by Bush Heritage Australia.

**Projects undertaken with previous employer*

Curriculum Vitae



Heather Duff

Ecologist

Role at RPS

Ecologist

Location

Sydney, NSW, Australia

Qualifications

Bachelor of Science, triple major in Ecology, Botany and Geology (University of Adelaide, 2016)

Bachelor of Science (Honours) in Geology (University of Adelaide, 2018)

Provide Remote First Aid – St Johns (Sydney, 2023)

RIW Card & Safely Access the Rail Corridor (Sydney, 2023)

Identify Grasses – Tocal College, NSW (Sydney 2023)

Platypus Monitoring – Australian Platypus Conservatory (Melbourne, 2020)

Demonstrate First Attack Firefighting Equipment (Adelaide, 2019)

White Card (Adelaide, 2019)

Publications

Cheesman, A., Duff, H., Hill, K., Cernusak, L. & McNerney, F. (2020) Isotopic and morphologic proxies for reconstructing light environment and leaf function of fossil leaves: a modern calibration in the Daintree Rainforest, Australia. American Journal of Botany. 107. 1165-1176. 10.1002/ajb2.1523.

Why Heather for this role

Heather is an ecologist with six years of consulting experience and four years in the ecology industry. Her skills include undertaking constraints assessments and biodiversity assessments across Greater Sydney and NSW.

Heather has been responsible for the overseeing of projects from inception through to delivery for Constraints and Biodiversity Surveys including field surveys, data management, mapping and reporting for Part 5 assessments. Heather has a sound understanding of the Sydney Water Biodiversity Offsets Scheme.

Relevant projects

Wind Farm, Biodiversity Development Assessment Report, 2024 – ongoing

Heather is an Ecologist supporting the ecological assessment in the Snowy Monaro region. Responsible for supervising and undertaking field assessments to support the Biodiversity Assessment Development Report, including vegetation integrity plots, targeted Bird and Bat Utilization Surveys and ongoing Grassland Earless Dragon population monitoring.

Flora and Fauna Assessment, School Infrastructure, NSW, 2024

Heather managed two Flora and Fauna projects for two existing schools in NSW. Heather undertook field assessment of the site, including vegetation identification, fauna assessment and developing a memo-report to be used in a

Targeted flora surveys, Private Developer, 2024

Heather undertook targeted flora surveys for a private developer in Moreton Park, NSW. This field work supported the Biodiversity Development Assessment Report.

Biodiversity Development Assessment Report, Private Developer, BDAR

Heather undertook field assessments to support the Biodiversity Development Assessment Report, including vegetation integrity plots to identify plant community types. She developed the report to improving likelihood of environmental approval with beneficial environmental outcomes.

HumeLink West CSSI Transmission Project, HumeLink West Joint Venture (UGL Limited and CPB Contractors), 2024 - ongoing

Heather is supporting the delivery of a post-approval Biodiversity Management Plan (BMP) for HumeLink West, a Critical State Significant Infrastructure (CSSI) 150 km long transmission project linking Snowy 2.0 to the Wagga Wagga Substation. Heather has authored the rehabilitation sub-plan to guide the rehabilitation of temporarily disturbed areas during construction works. She is also supporting on-ground aquatic habitat assessments to assess potential impacts associated with Key Fish Habitat.

Relevant projects

Appin (Part) Precinct Development, Walker Appin Developments Pty Ltd, 2024

Heather was an Ecologist for the staged development of Appin (Part) Precinct, undertaking BAM plots as part of the BDAR.

BAM Assessments, Riverlands Recreational Redevelopment, Milperra NSW, 2024 - ongoing

Joe has assisted with BAM assessments to support a BDAR for the Riverlands Recreational Redevelopment, Northern Precinct in Milperra NSW. This has included BAM plots, parallel transects for threatened flora, diurnal and nocturnal bird surveys, Cumberland Plain Land Snail Surveys and baited camera installations for threatened gliders.

Flora and Fauna Assessment, Central Coast Telecommunication Upgrades, NSW Telco Authority c/o Ventia, 2024

Heather prepared a Flora and Fauna Assessment (FFA) to assess the impacts of telecommunication impacts in native vegetation on the Central Coast, NSW. The FFA described the biodiversity values of the Proposal Area, the investigation methods used to examine and characterise these values, and impact assessments prepared for threatened biodiversity with potential to be affected by the Proposal.

Ecological Constraints Assessment, Kangaroo Valley Outdoor Education Centre, 2024

Heather supervised field investigations for an Ecological Constraints Assessment (ECA) for the International Grammar School Sydney in Kangaroo Valley. Heather provided information on the biodiversity assessment framework and appropriate approval pathway for potential future development, as well as a constraints analysis for all ecological values within the Project Area to guide future development design.

Newnes Plateau Shrub Swamp Endangered Ecological Community (EEC) Monitoring, Springvale and Angus Place, 2023 – ongoing

Heather assists in undertaking fieldwork for a long-term monitoring program of swamp vegetation. Tasks included assisting in flora monitoring, data analysis, and seasonal and annual scientific report writing.

Source Control – Biodiversity Constraints Assessment, Sydney Water Planning Partnership, 2023*

Heather conducted Biodiversity Assessments in alignment with relevant NSW and Australian Government legislation for a package of works across Western Sydney. Heather conducted field work to confirm potential biodiversity constraints on-

site and provide recommendations to Sydney Water on relevant mitigation measures. Identification of threatened species on-site allowed Heather to conduct additional targeted flora surveys and provide concise mapping to avoid impacts to threatened species where possible. This information was used to inform their REF.

Biodiversity Constraints Assessment, Northern Beaches, Sydney Water Planning Partnership, 2022 to 2024*

Managed and delivered a Biodiversity Constraints Assessment for an existing asset in the Northern Beaches. Heather provided a constraints report that detailed potential impacts to PCTs, TECs and mitigation measures. Recommendations informed the project design and prioritised biodiversity retention.

Biodiversity Constraints Assessment and targeted Koala Phascolarctos cinereus surveys, Western Sydney, Sydney Water Planning Partnership, 2023*

Biodiversity Constraints Assessment and targeted Koala survey program for an existing site upgrades. Heather conducted biodiversity assessments to identify and map Plant Community Types (PCTs), potential Threatened Ecological Communities (TECs), Koala feed tree species and undertake nocturnal targeted koala surveys. Deliverables included a Biodiversity report detailing constraints and recommendations to avoid impacts to biodiversity, considering relevant legislation and Sydney Waters' Biodiversity Offset Plan.

Biodiversity Assessment, Sydney Water Planning Partnership, 2023*

Heather assisted in Biodiversity Assessments for pipeline upgrades at a Western Sydney intersection. The project identified several biodiversity constraints and recommended further targeted investigations, including Cumberland Plain Woodland Snail pre-clearance and Green and Golden Bell-Frogs, to ensure impacts to threatened flora or fauna were mitigated where possible.

Targeted orchid surveys and biodiversity assessment, Sydney, Sydney Water Planning Partnership, 2023*

Heather conducted a Biodiversity Assessment of existing infrastructure at Elanora Heights, including mapping of PCTs and habitat features. Potential habitat for the threatened Leafless Tongue Orchid *Cryptostylis hunteriana* was identified onsite and subsequent targeted surveys were recommended. Heather led the project from initiation to delivery, organised field resources and carried out targeted surveys in transects.

Biodiversity Training Day, Sydney Water Planning Partnership, 2023*

Heather was part of the team to deliver a comprehensive Biodiversity Training day to environmental staff. This training session covered the process of Biodiversity Assessments, features investigated on-site and common legislative tools that are used in Biodiversity Assessments.

Sydney Wharf Inspections, Confidential client, 2023*

Managing ecological inspections of an existing wharf in Sydney Harbour, including habitat assessment of piles through inspection by GoPro. Heather designed the sampling program, conducted field work and processed inspection footage. Managed the project from initiation to delivery, and the categorisation of habitat allowed divers to carry out inspections while some areas were still inspected for threatened species, allowing the client to meet their deadlines.

Wallerawang Masterplan ecological assessment, Wallerawang, Greenspot, 2023*

Conducted biodiversity surveys at a decommissioned coal power station to inform a proposed masterplan development. The assessment includes anabat deployment and vegetation mapping across a considerable landscape. Heather was the support for conducting BAM vegetation plots to identify the PCTs onsite. This information will feed into the masterplan planning phase and proposal of a green corridor to increase the biodiversity value for future communities.

Australia Avenue, Transport for NSW, 2022*

Ecological survey of a major NSW intersection, including identification of threatened species habitat, anabat deployment, flyout watches and Green and Golden Bell Frog targeted surveys. This information will inform the upgrade of intersection within Sydney Olympic Park.

Offshore Wind Environmental Fatal Flaws Assessment, Confidential client, 2022*

Conducted a desktop fatal flaws assessment to consider impacts of a proposed offshore wind project to the marine environment. Heather undertook desktop research into ecological values that could be impacted by the installation of a windfarm and associated infrastructure.

Central Station Biodiversity Development Assessment Report Waiver Application, Transport for NSW, 2022*

Successful submission of a BDAR Waiver Application request to display that proposed works would have no impact to vegetation or ecological value in the Central Station, Sydney. This

application was successful and allowed the project to proceed without further ecological assessment required.

Flora and Fauna assessment – Confidential location, Water NSW, 2021*

Heather undertook required monitoring of the condition of flora and fauna beneath an existing dam wall in NSW. Heather undertook field investigations to determine species presence or absence, including Koala searches (SAT Survey), targeted flora surveys, anabat deployment and mapping of important ecological values such as hollows and caves. She also recorded ecological function of Biodiversity Assessment Method (BAM) plots for PCT identification.

Heather's efforts to deliver accurate, planned and targeted field investigations ensured that detailed information on the current ecological condition of the study area was understood.

Biodiversity Constraints Assessment, Confidential client, 2021*

Desktop constraints assessment under a Part 4 development pathway for potentially sensitive ecological features within an established parkland for a local Western Sydney Council area. Heather developed a series of constraints maps that enabled the client to avoid areas of valuable or threatened biodiversity and recommend areas for future development.

Heather's constraints assessment enabled the development of recreational facilities without triggering a BDAR, saving the client significant development costs and ensuring valuable vegetation could be retained without being impacted.

Western Sydney Parklands Water Quality Assessment, WSP Trust, 2021*

Aquatic environmental monitoring, including recording basic water quality measurements and determine the potential usage of water across the Western Sydney Parklands.

Undertaking data analysis against the relevant recreational and human health water quality guidelines enabled production of a technical report for the Western Sydney Parklands Trust including recommendations against the general use of water for recreational purposes and directing future studies within the park.

Glencore Seasonal Water Quality Assessment, Glencore, 2021*

Freshwater aquatic monitoring at the Hunter Valley coal mine in sensitive aquatic systems surrounding and within operational mine sites. Invertebrate

sampling and water quality monitoring was completed for potentially impacted and control sites.

Western Sydney Connectivity Project, Confidential client, 2021*

Flora and fauna assessments for a proposed transport corridor across Western New South Wales. Heather utilized her project management skills to organise site access with key stakeholders and private residential owners affected by the proposed development and undertook data management. She ensured that field work was conducted in an efficient manner and stakeholders were always informed of access requirements.

Biodiversity Assessments, Confidential client, 2021*

Ecological assessments at multiple sites for the expiation of four operational sites. Part of the field team, undertaking initial vegetation mapping onsite and targeted flora and fauna surveys in line with the NSW Biodiversity Assessment Method (BAM).

Orange-bellied Parrot Seasonal Population Surveys, Mount Gambier to Portland, South Australia and Victoria, Nature Glenelg Trust, 2017*

Assisted a volunteer team to undertake seasonal population surveys for the OBP by investigating possible sighting locations provided by the client. Supported the team by investigating the given coordinates on-ground and searching for the species in known areas to identify its arrival time on the South-Western Victorian Coast.

Isotopic and morphologic proxies for reconstructing light environment and leaf function of fossil leaves: a modern calibration in the Daintree Rainforest, client, 2017*

Heather conducted research into the variation of micro-morphology of leaves from five species in the Daintree Forest. Samples were taken from variable heights above the rainforest canopy to the understory with associated light exposure measurements. By cross-correlating the morphological changes with exposure, Heather and her team were able to construct a multi-variant analysis tool that could be applied to fossil leaf assemblages to reconstruct light exposure profiles of ancient and extinct forest environments. This research was the first to identify that some species' micro-morphological reactions were not consistent between the underside and upper side of the leaf. This information is critical to ensuring future proxies

are accurate and highlights the reliance on fossil leaves from light-reactive species.

Environmental Planning

Newell Highway – Coonabarabran to Narrabri, - Transport for NSW, 2022*

Completed the soil, surface water and groundwater assessment chapters of the Review of Environmental Factors (REF) and Minor Works REF for the Newell Highway upgrade in regional NSW. This project is associated with forestry, conservation parks and areas with important heritage and required a good understanding of environmental and planning legislation to ensure the project aligns with requirements. This upgrade provides productivity and safety benefits for freight and agriculture and connects communities to jobs, services and their families; and allows visitors to experience the unique landscape of western NSW by providing economic investment in this remote area.

Wallaroo Master Planning, Confidential Client, 2021*

Co-authored the preliminary desktop research to inform the planning stage for an infrastructure upgrade. Undertook research for the overview of Planning, Heritage and Environmental Requirements for the region to inform the potential investigation requirements for the project.

Kamay Ferry Terminals, Transport for NSW, 2021*

Co-authored the submission of comments from the communities and stakeholders regarding the EIS delivered for the proposed ferry service and terminals.

Contaminated Land

Soil and groundwater contamination investigation, Australian Government, 2018 – 2020*

Led contamination investigations across regional and metropolitan South Australia to determine the extent of legacy contamination on several Commonwealth owned properties. Supervised field exercises, groundwater well installations and coordination of sample analysis. Her expertise allowed regional programs to be carried out successfully over month-long programs, ensuring all samples were accounted for and laboratory analysis completed.

Monroe VOC Vegetation Remediation, Confidential Client, 2020*

Investigated the potential for native *Eucalyptus* sp. on a heavily contaminated site to facilitate remediation of volatile organic compounds (VOC) from groundwater. Undertaking field investigation, conducting the data analysis and authoring the

technical report, the total concentration of VOC within the established trees was discovered and highlighted the value of retaining this vegetation onsite. She was also able to utilise groundwater data and geological mapping from borehole logging to identify perched and continuous groundwater systems, to further explain the variability between concentrations of VOC in trees.

Contamination Investigation and monitoring, Caltex Australia & VIVA Australia, 2018 – 2020*

Part of a team investigating the contamination of soil and groundwater in current and historically owned land across South Australia and NSW. Undertook groundwater sampling events onsite, acted as site supervisor during the drilling and installation of new groundwater wells and undertook data management tasks. The contaminants of concern included petroleum, volatile organic compounds and PFAS. This project required remote work for extended periods and ensure all quality assurance targets for samples were reached.

Groundwater Contamination Monitoring Caltex Australia & VIVA Australia, 2018 – 2020*

Conducted contamination monitoring events at various terminals and retail sites across metropolitan and regional South Australia, to determine the contamination potential within groundwater and the migration of chemicals of concern throughout the soil profile. This included sampling, analysing, conducting quality assurance procedures on physical and digital data.

National Groundwater Monitoring Program, Caltex Australia, 2018 – 2020*

Seasonal monitoring of groundwater levels at fuel terminals, distribution centres and retail sites for multiple petroleum companies. Determining groundwater levels at each site and model the direction of flow through each groundwater network to determine potential contamination pathways.

** projects undertaken for previous employers*

Curriculum Vitae



Joseph Baird Ecologist

Role at RPS

Ecologist

Location

Sydney, NSW, Australia

Qualifications

Bachelor of Science
(Honours), Environmental
Biology with Professional
Studies, Queen's University
of Belfast, (2015- 2019)

White Card

4WD Training

Why Joe for this role

Joe is an ecologist with five years of ecological consulting experience in Belfast, Ireland, and one year in Sydney, Australia. His skills include field ecology and environmental consultancy, specialising in habitat, vegetation, and threatened species surveys.

Joe has quickly adapted to working with NSW environments having undertaken field surveys throughout NSW including the Greater Sydney region, Hunter Valley, Northern Tablelands and Snowy Valleys.

Joe has been responsible for the delivery of ecological constraints assessments, Part 4 and 5 impact assessments, Biodiversity Assessment Method (BAM) field surveys, and post-approval monitoring. He has been responsible for managing projects from inception through to delivery including desktop research and literature review, flora and fauna field surveys, data management and statistical analysis, scientific writing and reporting.

Relevant projects

HumeLink West CSSI Transmission Project, HumeLink West Joint Venture (UGL Limited and CPB Contractors), 2024 – ongoing

Joe is supporting the delivery of a post-approval Biodiversity Management Plan (BMP) for HumeLink West, a Critical State Significant Infrastructure (CSSI) 150 km long transmission project linking Snowy 2.0 to the Wagga Wagga Substation. Joe has authored the unexpected finds procedure and species monitoring program monitor for uncertain, indirect and prescribed impacts as a result of construction works. He is also supporting on-ground works with EIS consistency assessments and Key Fish Habitat monitoring.

Flora and Fauna Assessment, Munmorah State Conservation Area Telecommunication Upgrades, NSW Telco Authority c/o Ventia, 2024

Joe prepared a Flora and Fauna Assessment (FFA) to assess the impacts of telecommunication impacts in Munmorah State Conservation Area NSW. The FFA described the biodiversity values of the Proposal Area, the investigation methods used to examine and characterise these values, and impact assessments prepared for threatened biodiversity with potential to be affected by the Proposal.

Flora and Fauna Assessment, Woy Woy Aerial Optic Fibre Installation, Ventia, 2024

Joe prepared a Flora and Fauna Assessment (FFA) to assess the impacts of linear aerial optic fibre cable installation in Woy Woy NSW. The assessment included rapid vegetation assessment and identification of threatened flora species and Threatened Ecological Communities. Joe undertook BC Act and EPBC Act Assessments of Significance to ensure the Project was unlikely to significantly impact threatened species.

Relevant projects

Flora and Fauna Assessment, Terrigal Aerial Optic Fibre Installation, Ventia, 2024

Joe prepared a Flora and Fauna Assessment (FFA) for linear aerial optic fibre cable installations in Terrigal NSW. This included the identification of threatened fauna habitats for protection during the proposed works.

Flora and Fauna Assessment, Wagstaffe, Kilcare and Killcare Heights Aerial Optic Fibre Installation, Ventia, 2024

Joe prepared a Flora and Fauna Assessment (FFA) for linear aerial optic fibre cable installations in Wagstaffe, Kilcare and Killcare Heights NSW. This included an Assessment of Significance (5-part Test) per the BC Act for the Endangered Ecological Community, Pittwater and Wagstaffe Spotted Gum Forest in the Sydney Basin Bioregion.

Flora and Fauna Assessment, Brisbane Water Aerial Optic Fibre Installation, Ventia, 2024

Joe prepared a Flora and Fauna Assessment (FFA) for linear aerial optic fibre cable installations in Brisbane Water NSW. Ecological impact minimisation and mitigation measures were recommended, including the management of weeds. Vegetation trimming and habitat removal by the Proposal was found not likely to have a significant impact on threatened species, ecological communities, or their habitats.

Ecological Constraints Assessment, Solar Farm and Battery Energy Storage System, Metlen Energy, 2024

Joe has undertaken ecological constraints assessment for a >600-hectare site being considered for a Solar Farm and Battery Energy Storage System near Casino NSW. Field surveys included habitat mapping, threatened species identification and rapid data points to validate vegetation communities on-site.

Ecological Constraints Assessment, Kangaroo Valley Outdoor Education Centre, 2024

Joe prepared an Ecological Constraints Assessment (ECA) for the International Grammar School Sydney in Kangaroo Valley. Joe provided information on the biodiversity assessment framework and appropriate approval pathway for potential future development, as well as a constraints analysis for all ecological values within the Project Area to guide future development design.

Newnes Plateau Shrub Swamp Endangered Ecological Community (EEC) Monitoring, Springvale and Angus Place, 2023 – ongoing

Undertaking fieldwork for a long-term monitoring program of swamp vegetation. Tasks included assisting in flora monitoring, data analysis, and seasonal and annual scientific report writing.

Clarence Coal Mine BAM Assessments, Centennial, 2024

Joe undertook BAM site assessments to support a Biodiversity Development Assessment Report (BDAR) for the Clarence Coal Mine. This included parallel transects for threatened flora and BAM plots to identify vegetation composition, structure and function.

BAM Assessments, Riverlands Recreational Redevelopment, Milperra NSW, 2024 - ongoing

Joe has assisted with BAM assessments to support a BDAR for the Riverlands Recreational Redevelopment, Northern Precinct in Milperra NSW. This has included BAM plots, parallel transects for threatened flora, diurnal and nocturnal bird surveys, Cumberland Plain Land Snail Surveys and baited camera installations for threatened gliders.

Curriculum Vitae



Natalie Wood

Geospatial Analyst

Role at RPS

Geospatial Analyst

Location

Newcastle, NSW, Australia

Qualifications

ArcGIS II: Essential Workflows Certificate, ESRI Australia, 2012

Computer Aided Drafting (AutoCAD), TAFE NSW, 1992

Computer Aided Drafting (M L Draft), TAFE NSW, 1991

Tracing Certificate, TAFE NSW, 1984

Why Natalie for this role

Natalie has over 30 years' experience in GIS and drafting in both the public and private sectors. During this time, she has developed extensive skills in GIS data management and the provision of drafting and cartographic support to multi-disciplinary projects involving specialists in ecology, planning, heritage, bush fire planning, surveying and mapping, and resource management.

Natalie is practiced in ArcGIS (both ArcGIS Pro and ArcMap), Global Mapper, MapInfo and AutoCad, and is proficient in the management of spatial data between GIS software programs. Natalie is skilled in the preparation of base data sets acquired from contemporary and historical resources; geo-registering of raster images; and the production and delivery of high-quality mapping.

Relevant projects

Warrego Solar Farm, Renewable Energy Partners, 2023 - ongoing

Provision of GIS services for the environmental assessment of a potential solar farm development in Queensland. Project involved the Preliminary Layout Options mapping and supply of data files for submission.

Gin Gin BESS, Bundaberg Regional Council, 2023 - ongoing

Provision of GIS services for the environmental assessment of an alternate BESS site in Queensland. Preliminary Layout Options mapping and supply of data files for submission.

BESS fee Proposal, Zen Energy, 2023 - ongoing

Provision of GIS services for the environmental assessment proposal BESS site in Queensland. Constraints mapping and supply of data files for submission.

Mason Dieu Solar Farm, Terrain Solar, 2022 - ongoing

Provision of GIS services for the environmental assessment of a potential solar farm development in NSW. Project involved the administration of a GIS web portal including the update and publishing for web services.

Upper Hunter AHIMS Study, Upper Hunter Shire Council, 2020 - 2023

Compiled existing Aboriginal heritage data to support a review of Aboriginal sites covering the council area. Project involved the creation of maps and a Google Earth data package that was sent out to Local Aboriginal Land Councils to assess existing locations and add new ones as required.

Relevant projects

Clarence Coal MOD 8 Mine Extension, Centennial Coal, 2021 - 2023

Responsible for the compilation of key ecological and environmental constraints data required for Biodiversity Impact Reports and Biodiversity Management Plans as part of the mine extension approval. Involved the management of ecological surveys conducted on a seasonal basis and the generation of report maps.

Fernleigh Track Review of Environmental Factors, Lake Macquarie City Council, 2017 - 2023

Provision of all aspects of GIS mapping for a comprehensive review of planning, environmental and historical factors for the development of a new cycle track, including the creation of a broad series of reporting maps.

Anna Bay Resort Biodiversity Development Assessment Report, Raphael Shin Enterprises, 2017 - 2022

Provision of all aspects of GIS mapping for a comprehensive environmental impact statement. Involved the review and compilation of prior survey effort conducted for ecological surveys.

EIS for 200,000 tonne Organics, Greenspot, 2018 - 2020

Preparation of plans for an Environmental Impact Statement (EIS) for a 200,000-tonne organics and nutrient recycling facility at Ravensworth, NSW. The project is a State Significant Development assessed by the NSW Department of Planning and Environment.

Diamond Beach Seniors Living Resort, 2019

Provision of GIS Mapping for constraints and opportunities maps and character analysis.

Reticulated Services REF, Cooranbong, 2018

Provision of GIS mapping for constraints and opportunities mapping identification of irrigation areas and support mapping for a comprehensive REF.

Master Plan of Surplus Land at Glendale, Sydney Trains / Hunter Development Corporation, 2017

Provision of GIS mapping to assist team in preparing constraints and opportunities maps and overall master plan.

Strategic Land Use Mapping Project NSW, 2017

Preparation of accurate mapping of heritage items associated with historical activities in the Blue Mountains, including heritage buffers, enabling the strategic use of property which avoided harm to heritage places.

EIS for 170MW Finley Solar Farm, ESCO Pty Ltd, 2017

GIS plans for an EIS for a proposed 170MW grid scale PV solar farm, including the management of all specialist assessments. Finley, NSW. The project was a State Significant Development assessed by the NSW Department of Planning and Environment.

Review of Environmental Factors (REF) for Coal Mining Activities, Centennial Coal, 2014 - 2019

Preparation of plans for an REF for subsidence monitoring activities across several areas of the Springvale Coal operations including archaeological and ecological impact assessments.

EIS for Resource Recovery & Recycling Facility at Wetherill Park, Bettergrow, 2017

Natalie provided GIS mapping support; preparing plans to inform an Environmental Impact Statement (EIS) for a 200,000-tonne resource recovery and waste recycling facility at Wetherill Park, NSW. The project was a State Significant Development assessed by the NSW Department of Planning and Environment.

National Broadband Network (NBN), Various Clients for Telstra, 2018

Provided GIS mapping for various NBN projects. Natalie was subsequently engaged to provide GIS instruction to client design teams.

Aboriginal Cultural Heritage Landscapes Mapping Project NSW, Northern Rivers Catchment Management Authority, 2015

Delivered mapping for the NRCMA developed from extensive consultation with local Aboriginal communities. This project identified areas of social value and intangible heritage significance to local Aboriginal communities, the resultant maps are used by the planning departments of the Nambucca, Bellingen, Clarence Valley, Kempsey and Port Macquarie Local Councils.

Town of Port Hedland City Growth Plan, Town of Port Hedland, 2015

Developed Heritage Precinct Plan mapping for inclusion in the strategic Town of Port Hedland City Growth Plan and Implementation Plan.

Ravensworth Coal NSW, Glencore, 2014

Undertook GIS mapping to assist RPS deliver prompt heritage advice to Xstrata regarding the unexpected discovery of historic material during road works.

Centennial Western Region Biodiversity Management Plan, Centennial Coal, ongoing

Natalie provided GIS support for a large number of figures for all western operations for RPS' Biodiversity Management Plan.

Wambo Coal Exploration Project NSW, Centennial Coal, 2010 - 2016

GIS mapping of identified Aboriginal Cultural Heritage sites for the Archaeologist GPS downloads, uploads and mapping of Aboriginal Heritage Assessments including Due Diligence of recorded sites and boreholes.

Bulga Coal Operations NSW, Xstrata, 2010 - 2012

Provided GIS mapping for European Heritage reporting. RPS also provided ecological services for due diligence surveys, annual monitoring surveys and preparation GIS mapping of advices and reporting for surface and underground operations.

Bylong Coal Mine NSW, Cockatoo Coal, 2010 - 2015

GIS mapping of approved accesses to borehole locations to support Ecological and archaeological due diligence works for coal exploration relating to a start-up coal mine in the NSW Bylong Valley.

Woolgoolga to Ballina Bypass Project NSW, Roads & Maritime Services

Provision of GIS mapping to assist Cultural Heritage team with salvage excavations for the project for RMS.

Great North Road NSW, Cessnock City Council, 2018

Creation of GIS maps for Council for to aid a report identifying any gaps in the Great North Road heritage listing.

Wambo Coal Singleton, Peabody, 2010 - 2015

Provided GIS mapping to support due diligence assessments and annual monitoring works across the site.

Mt Arthur Soil Stripping Project NSW, BHP Billiton, 2015 - 2018

Preparation GIS mapping of advices and reporting for surface operations, as part of large scale salvage works of Aboriginal artefacts for the client.

Curriculum Vitae



Robert Suansri

Role at RPS

Senior Spatial Analyst

Location

Newcastle, NSW, Australia

Qualifications

Bachelor of Science
(Ecology & Environmental
Services/Geographic
Information Systems GIS),
Charles Darwin University,
2001

Bachelor of Economics,
Charles Darwin University,
2001

Project Management, WSP,
2015

Memberships

Geospatial Council of
Australia (formerly SSSI)

Why Robert for this role

Robert has 20 years' experience in GIS working on projects and has extensive experience in the design, implementation, processing, analysis, desktop mapping and management of spatial databases. He now acts as GIS team lead for the RPS Newcastle team, managing GIS based projects and has worked on a range of projects including renewables, site secondments and GIS technical advisory, support and training roles. He has worked within a wide range of industries and disciplines including environment and ecological, mining, geotechnical and transport engineering. He seeks to provide solutions that allows for efficient and effective sharing of spatial data through web and mobile platforms.

Robert has trained in the use of various industry leading GIS software including ESRI ArcGIS suite of tools for web development, spatial analysis with imagery and demographic data and mobile field survey and capture. He is competent with a range of supporting software to support and improve the functionality of GIS including Global Mapper, Arc Hydro, Surfer, FME Desktop and mobile and GPS software.

Relevant projects

Northern tablelands Wind Farm, Origin Energy, 2024 - present

Robert created a GIS web application that compiled all relevant environmental and planning constraints relating the development of a wind farm near Armidale, NSW. The GIS application allows for the efficient sharing of spatial data via an interactive web browser, improving the assessment process. Robert has also provided direct support to the client, generating maps for approval documents. Robert has provided mobile applications allowing for in field data capture.

Newcastle Offshore Wind Project, Confidential Client, 2022 - present

Robert acted the GIS Lead for the Hunter based project, undertaking and coordinating administration of spatial data. He oversees the data maintenance, reporting requirements and built a project specific web portal using ESRI Experience Builder to facilitate improved sharing of spatial data to the internal project team. Robert also undertakes spatial analysis including a visual impact assessment.

Boro Rd Solar Farm and BESS, Samsung Renewables, 2024-present

Robert acts as the GIS Lead for the project as well as specialist. His role involves the review of outputs, overseeing the data administration and undertaking analysis. He undertook visual impact analysis of the project, identifying receivers and generating a Zone of Theoretical Visual Influence of the surrounding areas to determine which residences are likely to be visually impacted by the development.

Relevant projects

Renewables

Northern tablelands Wind Farm, Origin Energy, 2024 - present

Robert created a GIS web application that compiled all relevant environmental and planning constraints relating the development of a wind farm near Armidale, NSW. The GIS application allows for the efficient sharing of spatial data via an interactive web browser, improving the assessment process. Robert has also provided direct support to the client, generating maps for approval documents. Robert has provided mobile applications allowing for in field data capture.

Gippsland Offshore Wind Farm Fatal Flaws Assessment, Client Confidential, 2024,

Robert oversaw the administration and compilation of relevant GIS constraints data that occurred within the vicinity of the wind farm licence area, located with the seas off Victoria's Gippsland region. He also built a project web portal that facilitated efficient sharing of the constraints to the wider project team. Compiled constraints were further classified into constraint class to determine if there were any significant constraints to the projects development.

Star of the South Offshore Windfarm, Southerly Ten, 2023-present

Robert acts as the GIS Lead for the Victorian based project, undertaking and coordinating administration of spatial data. He is also responsible for the production and maintenance of maps required for reporting, ensuring all data shown is current. This has included the primary approval documents and over 10 technical specialist reports all with their unique requirements.

Boro Rd Solar Farm and BESS, Samsung Renewables, 2024-present

Robert acts as the GIS Lead for the project as well as specialist. His role involves the review of outputs, overseeing the data administration and undertaking analysis. He undertook visual impact analysis of the project, identifying receivers and generating a Zone of Theoretical Visual Influence of the surrounding areas to determine which residences are likely to be visually impacted by the development.

Project Tuuli Offshore Wind Farm, CIP, 2022-2023

Robert acts as the GIS Lead for the Hunter based project, undertaking and coordinating administration of spatial data. He oversees the data maintenance, reporting requirements and built a project specific web portal using ESRI Experience Builder to facilitate improved sharing of spatial data to the internal project team. Robert also undertakes spatial analysis including a visual impact assessment.

Spinifex Offshore Wind Farm, Alinta, 2022-present

Robert acts as the GIS Lead for the Victorian based project, undertaking and coordinating administration of spatial data. In addition to data maintenance he has built GIS web-based applications to facilitate improved sharing of spatial data to the internal project team. Robert also undertakes spatial analysis and produces plans for approval documents.

Moonlight Ridge Wind Farm and BESS Project, Confidential Client, 2023

Robert built a web application that compiled environmental and planning constraints that impacted the development of a proposed wind farm and BESS project in Moonlight Ridge Queensland. He undertook GIS analysis to determine the visual impact assessment. The application facilitated an efficient assessment workflow by the project team. Robert also created a mobile application that provide field team an interactive GIS solution to provide project related data in the field and also improved recording of field data.

New Zealand South Taranaki Bight Offshore Windfarm, CIP, 2022

Acts as the GIS lead, undertaking and coordinating administration and visualising spatial data related to the project, including ecology and other constraints data. To support the approval and data review process Robert built GIS web-based applications to facilitate improved sharing of spatial data to the internal project team which includes personnel from offices based in New Zealand, Victoria and Western Australia. He also undertakes spatial analysis and produces maps for reporting requirements.

Maxwell Solar Farm, EDF Renewables, 2021-present

Robert provided support to the client by compiling constraint information including land holding, geological and ecological constraints to assist the client in determining land suitable for a potential solar photovoltaic array. He produced plans that were utilised in tender design documents. Robert also built a GIS web application for the client to assist them with construction planning and design for the wind farm.

Central-West Orana Renewable Energy Zone, NSW Government Energy Co, 2022

Robert built a web portal the compiled project from prior preliminary assessments and open source NSW government data, giving the project team the ability to review and identify potential constraints to development. Mobile applications were developed for project teams providing in-field access to design and constraint data improving survey effort.

Clean Hydrogen Industry Hub Investigations, Department of Industry, Science, Energy and Resources, 2022

Robert acts as the GIS Lead, managing to his team in locating potential development constraints for a group of short-listed sites identified for a potential hydrogen hub. The process involves locating easily obtainable spatial data from government data portals and producing a series of plans to be included in presentations surrounding site viability.

Site Investigations for Renewables Projects, EDF Group Renewables, 2021-2022

Robert managed landholder spatial information as part of client's investigations into potential site investigations for renewables projects throughout Australia with heavy focus on locations within NSW. This involved production of landholder specific maps required for land acquisition discussions. Other project requirements included compiling known or potential constraints from government sources and key stakeholders and property analysis. For some sites a web-based application was built to support site investigations.

EnergyConnect Interconnector South Australia to Wagga Wagga, TransGrid, 2019-2021*

Robert acted as the GIS lead coordinating the GIS component with the different team members. Liaison with the client GIS personnel. He coordinated the incoming tasks amongst the team to ensure quick delivery as required by the client, undertook ecological analysis to determine areas of high ecological significance, fauna corridors and vegetation impact calculations. He also assisted in the maintenance of all GIS data and the digital web portal designed to share project information within the project team and with the client.

Technical Advice and Support

GIS Implementation Strategy, Greening Australia, 2024

RPS and Greening Australia engaged in a 3 year partnership where RPS participated in planting program and provided pro bono support for projects. One project was a GIS Implementation Strategy where RPS researched and recommended options that would help improve Greening Australia work flows. This included assessment of GIS and other software solutions such as agricultural software that would improve planting programs and long term monitoring.

WA Market Capacity Assessment, Department of Defence, 2024

This project involved identifying the available workforce for construction work at HMAS Stirling in WA. Robert undertook drive time analysis which was overlayed with employment demographic information which identified where the relevant

workforce within the vicinity of HMAS Stirling but also determine as to whether they are within the drive time threshold. This analysis allowed client to understand the available resources available to undertake works on site.

Provision of a LiDAR Canopy Model, Clean Energy Regulator (CER), 2023-present

Robert is the project manager of a multi-disciplinary team including data scientists, ecologists and LiDAR capture team to provide CER a vegetation canopy cover model using satellite imagery using Artificial Intelligence/Machine Learning (AI/ML). He acts as the client liaison, oversees the budget and ensuring deliverables are kept on track. He also looks after any GIS requirements needed the project, including development of mobile applications for field work.

GIS Transformation Project Support, Hunter Water Corporation, 2023-present

Robert is engaged to assist Hunter Water in a major upgrade to their GIS utility asset management system. His role is to oversee the development of the GIS web application liaising with the developer on behalf of the client to ensure the application is able to meet internal corporation requirements and public needs. Robert was able to pick up this engagement on strength of a prior project completed for the client.

GIS Technical Advisor and Support for Open Pit Continuation Project, Evolution Mining, 2022-present

Robert acts as the GIS lead for the client, providing technical GIS support and advice directly to the client for their gold mine expansion project. Support included managing the spatial data related to site operations from a range of sources including mine surveyors and subconsultants, undertaking spatial analysis and map production for tenders. The role requires liaising directly with different internal groups and subconsultants.

Regional Context Mapping and Insights, Western Parklands City Authority (WPCA), 2022

Robert provides GIS analytical support to the existing team at WPCA. The analysis he undertakes feeds into the planning decision making process regarding future development and planning opportunities. The spatial analysis feeds into a large data analytical approach that utilises non-spatial data sets including demographic/census data. Support also includes GIS backend support allowing for efficient sharing of data between RPS and WPCA.

Marshall Mount Road Landscape Visual Impact Assessment, FIGA Partnership, 2021

Undertook ZTV/viewshed analysis for proposed subdivision site and surrounds. Supported field surveys with development of mobile applications for

field capture of viewpoint locations and photos which were imported into a desktop web application that overlaid survey locations, ZTV analysis outcomes and proposed subdivision designs. The web application forms the basis of figures to support reporting.

Diocese Maps and Web Portal, Catholic Diocese of Broken Bay, 2022

The client approached Robert to update a series of maps showing key locations within diocese area. The update included a visual and data refresh of the existing plans but also included a web portal built of the Google My Maps platform that provided the client with a low cost and low development web solution that could be used internally.

GIS Implementation and Training, Worimi Aboriginal Land Council, 2021-2022

Robert assisted the client in updating and implementing the GIS platform used internally to ensure the client's GIS capability remained current. The update involved transition from ArcMap to ArcGIS Pro leveraging the benefits of ArcGIS Online. Also provided was a GIS management plan and onsite training to new staff as well as ongoing support.

Hunter Water Secondment, Hunter Water Corporation, 2020-2021*

Secondment involved the shadowing of the retiring GIS team leader in order to assist Hunter Water during the transition to new team leader. The role involved getting an understanding of the existing GIS specific tasks undertaken exclusively by the outgoing team leader to ensure these tasks continued during the transition period and produce documentation of the tasks. Tasks included the administration of ArcGIS Online, running of FME scripts, providing support to internal and external groups and end of month reporting of assets. Also provided support to the GIS team assisting with overflow work.

Ravensworth Open Cut GIS Support, Glencore Bulga Coal, 2018-2021*

Robert revised the existing data structure to a modern data structure using an ESRI geodatabase structure (GDB) and combining multiple datasets into a single master file. Metadata was assigned for each file imported into the new GDB structure. The initial restructure works has led to an ongoing engagement for data maintenance ensuring data is kept current. Other duties include support to the environment and community team including training and development of a GIS management plan.

Mt Owen Complex GIS Secondment Ravensworth, Glencore Bulga Coal, 2017-2021*

Robert revised the existing data structure for the Ravensworth Coal Administer, improve and maintain

the management of all GIS spatial data relevant for the operation of the Mt Owen and Glendell mine. Involved the merging of 2 separate GIS catalogues into single geodatabase (GDB). The process involved identifying the most relevant dataset. Also necessary is the need to create a data structure to allow user easy access to a wide range of data sources including the technical services team and neighbouring mine sites. Other duties included support to the environment and community team including training and development of a GIS management plan.

Bulga Coal Complex GIS Secondment Broke, Glencore Bulga Coal, 2014-2021*

Engaged to administer, improve and maintain the management of all GIS spatial data relevant for the operation of the Bulga Open Cut and Bulga Underground Operations. This involved the merging of 3 separate GIS catalogues into single geodatabase (GDB). Much of the data was not yet been correctly catalogued making it difficult to determine the currency and/or accuracy of the data. Other duties include support to the environment and community team with data updates and plan creation for reports and field operations and onsite training into GIS techniques and procedures. Have also performed data analysis and modelling, such as determine the landform following longwall subsidence.

United Collieries Secondment Jerry Plains, Glencore United Collieries, 2015*

Robert reviewed and compiled current geospatial data from the United Collieries and Wambo Coal mines in preparation for a future joint venture between companies. Actions involved compiling and transferring existing spatial dataset (including ESRI shapefiles, MapInfo TAB and AutoCAD design files) into a geodatabase structure, including identifying and archiving redundant data. Basic metadata was created for each file transferred to the new data structure. Basic map templates were also created for reporting purposes.

Western Sydney Parklands Trust secondment, Parramatta, Western Sydney Parklands Trust, 2012*

Compilation and management of various spatial data into a single geodatabase. Data included property, land use, environmental and parkland assets. Much of the information was not GIS ready and needed to be digitized. Data tables needed to be designed to allow for the Trust to manage their different assets and maintenance contracts, strategic land use and biodiversity projects.

NetWork Alliance Secondment, Sydney Water, 2010*

Robert was seconded to the NetWork Alliance water infrastructure upgrade project administering the GIS

project data, utilising MapInfo GIS software. Produced and plans for works programs and for environmental and heritage constraints.

Advisory and Strategic Investment

Western Sydney Parklands Transport Study, Western Sydney Parklands Trust, 2023-ongoing

Robert undertook a multimodal transport assessment of proposed developments in the Western Sydney Parklands region. It involved utilising public transport, latest Census and NSW employment projection data to understand the level of access to jobs and amenities people living in new development areas will have, taking into account transport options. This analysis involved the use of the ESRI Network Analysis toolset.

Thompson Creek Parkland Accessibility Study, NSW Office of Strategic Lands, 2023

Robert undertook an accessibility assessment of a proposed new parkland with the Western Sydney Aerotropolis region. It involved incorporating a proposed subdivision road network into the existing road network to understand the residents who could easily access the proposed Thompson Creek parkland.

Environment

Annual Ecological Monitoring Programs, Centennial, 2021-present

As part of a seasonal monitoring program Robert developed a range of mobile applications built off the ESRI platforms of Survey123 and Field Maps to improve the capture of spatial data by field team. As part of this development, he joined the field teams which allowed him to better appreciate the workflow and help refine the user experience.

Brownstein Swamp Health Analysis, Centennial, 2021-present

As part of a seasonal monitoring program Robert performs a GIS spatial analysis to determine swamp health within an underground mining area. This method, based on the Brownstein vegetation health methodology involves process automation the streamline the analysis and outputting a range of statistics required for further analysis by ecologists.

Minmi Road Interchange Upgrade, Road & Maritime Services, 2020-2021*

Robert compiled and administered spatial data required as part of the project, including design and environmental data. He supported survey teams with detailed field plans and GPS files, and produced report figures for a series of reports, highlighting constraints in relation to the project.

Williamtown to Bobs Farm Nelson Bay Road Upgrade and Preliminary Environmental

Investigations, Road & Maritime Services, 2019-2021*

Robert compiled and administered spatial data required as part of the project, including design and environmental data. He supported survey teams with detailed field plans and GPS files, and produced report figures for a series of reports, highlighting constraints in relation to the project.

Complex Capital Works Programme Hunter region, Hunter Water, 2019-2021*

Robert established a digital portal to display project spatial data through a web browser. The portal allowed for the project team to easily assess conflicts between the environmental and design data. For each dataset included for the portal metadata was applied. He also developed a series of digital forms for use with Survey123 data capture applications.

Henry Lawson Drive Biodiversity Assessment Bankstown, Road & Maritime Services, 2018-2021*

Robert compiled data relevant to the project assessment, undertook vegetation mapping based on field assessed data. He undertook area calculations as required for BDAR assessments and created a series of plans to support reporting.

New Intercity Fleet Maintenance Facility Project, Transport for NSW, 2016-2021*

Compiled and administered spatial data required as part of the project, including design and environmental data. Robert ran spatial analysis to help determine potential habitat areas for a potential threatened species affected by the project. He assisted survey teams with detailed field plans and GPS files.

Mt Pleasant Hydrological Assessment Muswellbrook, Rio Tinto, 2014-2015*

Robert derived an elevation model for different phases of mining based on different mine designs. The model took into account the variation in surface elevation up to 2040. This model was used for groundwater flow modelling. He also derived mine domains based on the mine designs and compiled and managed all relevant spatial data.

Greater Blue Mountains World Heritage Values Study Cessnock/Lower Hunter Region, Department of Sustainability, Environment, Water, Population and Communities, 2013*

Robert developed a sensitivity model based on a multiple criteria assessment including level of biodiversity and vegetation connectivity to determine areas suitable for potential world heritage listing. He managed the project geodatabase for all spatial information.

Vegetation mapping of the Lower Hunter region, Department of Sustainability, Environment, Water, Population and Communities, 2013*

Compiled and managed numerous project databases required to revised and map the study area. Robert developed a custom tablet application to allow survey teams to better capture data in the field and improve integration of field data. He updated vegetation communities based on survey data and aerial photography interpretation.

Stormwater Channels Inspection Program, Hunter Water, 2013*

Pre-processing of data to prepare to load onto PDAs running ArcPad mobile software. Post processing of survey data running custom designed software scripts to assign attribute information to original data based on surveyed information. Creation of digital reports and spatial viewers again using custom software scripts to produce the outputs. The Spatial viewer allowed users to query sections along a stormwater channel with links to photos captured at each location during the survey.

Cooks River Bank Naturalisation, Sydney Water, 2011-2012*

Management of the project geodatabase for 3 different naturalisation sites along the Cooks River. Data was created internally and supplied directly from the client. Detailed concept plans were provided in CAD format which required editing to highlight key components of the design and calculate the expected impact from construction. Report figures were produced highlighting the potential constraints for each project site.

Kerraway Power Station Environmental Assessment, Origin Energy, 2011*

Management of the project geodatabase containing all associated data required for the project from both internal and external sources. Detailed calculations were conducted to identify the potential impact of the proposed and power station and supporting infrastructure. Produced a series of survey figures for vegetation and hydrology surveys and for the environmental assessment report.

Golden Sun Moth surveys for the Macgregor West subdivision ACT, The Village Building Co, 2009-2010*

This project required created a spatial dataset of survey transects conducted in study area. Attributes recorded included Golden Sun Moths counts along each transect and overall transect lengths. Analysis was conducted to determine species densities for each 100 metres of survey. A dataset depicting moth coverage for the overall study area was derived based on density classes and transect corridor width.

Macrophyte survey of the Penrith Lakes district, Penrith, Penrith Lakes Development Council, 2006-2008*

Robert developed techniques and related datasets to map the coverage of macrophytes in lake areas to track species abundances to assist in management programs. Techniques were based on a previously developed aquatic ecology practices and involved interpretation and compilation of survey data from random transects and calculation of species density classes based on sociability and abundance values determined from survey. For some lake sections macrophyte coverage where overlayed on a 3-dimensional model of the shoreline.

Legal advice for illegal land clearing, Bundanoon, Department of Climate Change, Environment and Water, 2008*

Geo-referenced a historic series of aerial photography covering 40 year timeframe over a property in the Bundanoon area. Vegetation coverage for each year of photography was accurately digitized and utilized to highlight the rate of illegal land clearing undertaken by the land owner. This information was used as evidence in court.

Transport

Lower Hunter Freight Bypass Corridor Assessment, Transport for NSW, 2013-2021*

Robert managed project spatial geodatabase including ecological and mining workings, performed vegetation impact calculations based on a multitude of corridor sections and widths, and produced a series of figures for the ecology technical paper including sensitivity values maps based on previous work for the Greater Blue Mountains World Heritage Values Study (2013) released for public use.

Inland Rail Project Enhancement Works Various sites in NSW and VIC, ARTC, 2016*

Robert compiled and administered the various dataset involved in the project. Required working to client's specific data requirements and structure. He assisted in the planning of services location surveys. In addition to the creation of environmental, geotechnical and service location figures metadata was created for all data layers sent to the client following the completion of the project.

Outer Sydney Orbital, RMS for Transport for NSW, 2014-2015*

Robert compiled and managed all spatial data in a single geodatabase, including multiple alignment options and potential constraints. He created and administered a web service overlaying all data accessible via web browsers to the project team. He also extended the web service into a web map service for the design team.

Western Sydney Freight Line, Transport for NSW, 2014*

Robert administered central geodatabase of all spatial data, digitised existing and potential developments, produced a series of plans highlighting proposed route options and intermodal hubs, major transport links and utilities. He produced biodiversity report figures highlighting ecological constraints for each option.

Sydney Light Rail Project, CSELR, 2014*

Robert compiled and administrated hydrogeological and geotechnical data, developed a series of plans highlighting all expected utilities located along the George Street section of the proposed alignment, created plans incorporating existing design data located on a web server, produced a series of plans highlighting groundwater constraints in the surrounding area, including groundwater depth spectrum maps. He also produced a series of long and cross section plans highlighting the subsurface impact of a proposed tunnel section.

Epping to Thornleigh Third Track Concept Design, Transport for NSW, 2012*

Robert administered project geodatabase for all spatial data including ecology and heritage information. A detailed vegetation dataset was created based on existing vegetation datasets but modified to reflect current high-resolution aerial photography and ground-truth surveys. He incorporated detailed CAD designs directly into the GIS and calculated direct impacts based on design details. Determination of the impact area involved varying construction buffers based on the design feature and calculated to the nearest metre. Produced a series of figures for Environmental Assessment and specialist reports including Ecology Visual Assessments. Produced a wall map for community consultation.

Gosford Passing Loops, Transport for NSW, 2011-2012*

Management of the project geodatabase containing all associated data required for the project. A detailed vegetation dataset was created based on high-resolution aerial photography and ground-truth surveys. Calculated accurate impact areas based on detailed CAD designs imported into the GIS. Determination of the impact area involved varying construction buffers based on the design feature and calculated to the nearest metre. Produced report figures directly for GHD to go into a Review of Environmental Factors report. Export and import of CAD data and aerial imagery for use within AutoCAD and ArcGIS.

WestConnex Concept Design, Roads & Maritime Services, 2012*

Spatially located all local heritage items surrounding the proposed WestConnex underpass by utilising SQL to identify significant properties. Robert produced a series of maps highlighting their location in relation to the proposed route design.

Northern Freight Transport Corridor, Transport for NSW, 2011-2012*

Management of the project geodatabase containing all associated data required for the project. Produced and maintained a series of figures for geotechnical and environmental surveys. Export and import of CAD data for use within AutoCAD and ArcGIS respectively.

Gerringong to Bomaderry Princes Highway Upgrade, AECOM, 2007-2009*

Development of datasets to compile data recorded from flora and fauna seasonal surveys, maintenance and update of existing vegetation data based on ground-truth surveys. Other responsibilities included accurate determination of impact footprint based on a CAD design and specific engineering specifications, calculation of vegetation loss from direct and indirect impacts.

Tintenbar to Ewingsdale Pacific Highway Upgrade, ARUP, 2005-2007*

Development of a vegetation constraints dataset based on community types and ground-truth surveys. Other datasets developed included compilation of threatened flora and fauna data from numerous sources including digitized local council maps. Spatial analysis was undertaken to determine the direct and indirect impacts of proposed route footprints. Data was used for a preliminary Opportunities and Constraints report and a subsequent Environmental Assessment report.

F3 to Raymond Terrace Pacific Highway Upgrade Environmental Impact Statement, RTA, 2005-2006*

Robert compiled datasets for threatened flora and fauna species, vegetation areas and survey effort. The vegetation dataset was modified from existing LHCCREMS vegetation database to reflect current high-resolution aerial photography, ground-truth surveys. A secondary vegetation dataset was derived which took into account 50m edge effects to accurately determine impacts to core vegetation areas. Direct and indirect impact calculations were calculated based on the route footprint using both actual and edge effected vegetation. This project also involved a cultural heritage component identifying potential impact to Aboriginal heritage sites.

Contaminated lands management

Caltex Gauging Program Newcastle, Caltex Australia, 2013*

Management of the project geodatabase during rounds 5 and 6 of the national service station gauging program. Weekly update of the web service with new survey information. Robert prepared Windows PC tablets for survey with a custom survey application utilising GIS to view well and service station infrastructure.

Newcastle Gasworks Remediation Hamilton NSW, Jemena, 2014*

Robert compiled numerous amounts of sampling data into a single data table. Robert created a series of cross sections using the CrossView ESRI extension tool showing the inferred location and extent of contaminants located beneath the surface. He administered the project geodatabase and produced a series of detailed maps for the final report.

Mittagong Pole Yard Site Remediation, Endeavour Energy, 2012*

Robert compiled previous survey sampling site locations into a geodatabase. Also integrated CAD survey data and digitized sampling sites based on survey sheets. Produced a series of figures highlighting degree of contamination of different chemicals at each sample site.

Caltex Gunnedah Depot Post Phase Work, Caltex Australia, 2011-2013*

Robert compiled and managed geodatabase of a series of survey sites conducted from 2010 to 2013. Produced time series figures highlighting the change over time of groundwater contaminants for each of the sampling sites.

Heritage

Bulli Seam Archaeological Assessment, BHP / Illawarra Coal, 2008-2009*

Establishment and maintenance of a spatial dataset with over 600 Aboriginal heritage sites incorporating data acquired from numerous sources over the Appin and West Cliff longwall mine regions. Spatial analysis used to determine locations of targeted surveys based on the occurrence sites of high and medium significance. Following detailed surveys site location and details were updated to reflect improved spatial accuracy and cultural information. A buffer of sensitivity for high and medium-high significance sites was derived to highlight areas where impacted was to be restricted.

Archaeological assessment for the Macquarie Marshes and Gwydir Wetlands, Department of Climate Change, Environment and Water, 2007*

Development of an Aboriginal cultural sensitivity model to identify areas of high to low cultural significance throughout the wetland areas. Using MapInfo Professional, a raster model was developed to highlight factors such as occurrence of Aboriginal cultural sites, vegetation, Mitchell soil landscapes and proximity to drainage lines and ultimately convey overall archaeological significance of an area.

Crookwell II Wind Farm Archaeological Assessment, Department of Climate Change, Environment and Water, 2006-2009*

Robert compiled hundreds of survey pit information into a single dataset. Survey information was further refined to indicate areas of high Aboriginal artefacts and used to identify constraints to the proposed windfarm develop to avoid or minimize the impact on Aboriginal heritage values. A supporting natural heritage assessment to identify further potential constraints in relation to flora, fauna and vegetation communities.

Heritage assessment for the Meeting Place Precinct, Botany Bay National Park, Design-5 Heritage Architects, 2006*

Robert Geo-referenced a series of historic survey plans dating back to the early 1900s to determine the potential location of historic heritage sites for assessment and a subsequent zoning plan. As early 19th century plans lack accurate spatial information plans were geo-referenced to best fit. The proposed works were overlaid over the various survey plans and potential areas of impact were identified.

Cultural Heritage Investigations of the North and South Exploration Drilling Areas, Western Cape York Peninsula Qld, Comalco Aluminium Ltd, 2006*

This project involved compilation of survey information used to provide baseline archaeological and cultural heritage data at a landscape level. This allowed the client to manage the cultural heritage values of the mine lease areas. Project also involved environmental assessment component which was used to establish a baseline for natural heritage values.

Mining

GIS Subsidence Drainage Analysis, Glencore Bulga Underground Operations, 2018-2019*

Robert undertook a drainage analysis using the ESRI ArcHydro software tools to model the catchment and drainage over an underground mining area. The analysis was to show how mining subsidence has affected surface water drainage.

Following the modelling a letter report was written in conjunction with a Water Engineer and provided to the client.

**Disturbance and Rehabilitation Data
Standardisation Broke, Glencore Coal Assets
Australia, 2015***

Merge separate disturbance and rehabilitation geospatial datasets into a single dataset for numerous Glencore coal mine sites throughout NSW to simplify the tracking and reporting of disturbance and rehabilitation progress for individual mine sites. Process involved reviewing different mine site disturbance and rehabilitation datasets to design a standard to be rolled out across all mine sites. Following a successful roll out across NSW it is planned for this project to be rolled out across QLD.

**Boggabri Coal Mine, Boggabri Coal Operations,
2013-2021***

Centralised and administered all spatial data into a geodatabase which involved compiling and centralising spatial data created over several years for numerous ecological projects. Developed and refined mine operation management zones and surface water catchments areas based on mine pit design and rehabilitation requirements for the Mine Operation Plan.

**Dry Creek Diversion Project, Bengalla Mining
Company, 2014-2021***

Development of a web service allowing for quick and easy dissemination of spatial data to the wider project team. The web service ensures that all project teams will have access to current information via any web browser. Information available in the web service included the ability to show the existing and final land form profiles and facilitated the ability to track the location of personnel on site with GPS units.

**Wyuna Exploration GPS Tracking Emerald,
Glencore Oaky Creek Coal, 2015***

Establishment of a web service that allowed for the tracking of survey teams across the Wyuna exploration lease. The web service will make use of GPS units to locate personnel on site.

** projects undertaken for previous employers*

Annexure J Additional and Appropriate Measures under Condition B30(d)(xiii)

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Monday, 2 September 2024

Allison Treweek

Senior Team Leader, Southeast Conservation Planning Team, Biodiversity Conservation Division

NSW Department of Climate Change, Energy, the Environment and Water

11 Farrer Place, Queanbeyan, NSW, 2620

Dear Allison,

Transgrid's proposals for additional and appropriate measures to compensate the likely serious and irreversible impacts arising from HumeLink

The aim of this letter is to present Transgrid's proposal for Additional and Appropriate Measures (A&AM) for all the Serious and Irreversible Impact (SAIL) entities that will likely be subject to SAIL due to the biodiversity impact of the HumeLink project (SSI-36656827).

Table 1 - Summary of SAIL entities identified in the draft amended Biodiversity Development Assessment Report (BDAR -Revision C) for HumeLink that are likely to be subject to a SAIL.

Entity names	SAIL principle*	Direct impact (ha)
<i>White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland (Box Gum Woodland or BGW)</i>	Principles 1** & 2 [†]	477.91
<i>Pimelea bracteata (Rice Flower)</i>	Principle 2	4.76
<i>Tyto tenebricosa (Sooty Owl)</i>	Principle 4 [‡]	68.81

*As per [clause 6.7 the Biodiversity Conservation Regulation \(2017\) NSW](#).

SAIL due to a further decline of the species or ecological community that is currently in a **rapid rate of decline.

[†] SAIL due to a further reduction in the population size of the species or ecological community that already has a **very small population size**.

[‡]SAIL due to the species being **unlikely to respond to measures to improve its habitat**.

The objective of this letter is to:

- Outline Transgrid's A&AM proposals for the entities listed in Table 1 to the NSW Biodiversity Conservation and Sciences Division (BCS).
- Provide sufficient detail about each A&AM to enable drafting of Conditions of Approval.

Legislative framework

[Section 7.16 of the Biodiversity Conservation Act 2016 NSW](#) states that where state significant infrastructure is likely to have serious and irreversible impacts on biodiversity values, the Minister is required to determine whether there are any additional and appropriate measures that will minimise those

impacts if consent or approval is to be granted. The *Biodiversity Conservation Regulation 2017* does not elaborate on the meaning of 'additional and appropriate measures', there is no case law from the NSW Land and Environment Court defining the term, and there are no published NSW Government guidelines. Hence, the content of A&AM has largely been determined through consultation with the NSW BCS, the outcomes of which are documented below.

Consultation

Transgrid and BCD formally consulted about A&AM on the following dates:

- Wednesday 13 March 2024
- Wednesday 10 May 2024
- Monday 13 May 2024
- Wednesday 22 May 2024
- Wednesday 12 June 2024

Additional informal consultation occurred outside of these dates. A summary of the outcomes of this consultation can be found below:

- A&AM would ideally occur within the same IBRA region as the impact.
- A&AM must be additional to the biodiversity offset measures required to be delivered for the HumeLink project.
- Preparation, establishment and funding of a Local Area Management Plan (LAMP) is a recommended option for **Box Gum Woodland** A&AM.
- A LAMP would seek:
 - to deliver a landscape-scale restoration project, and may be based upon an indicator species model of conservation ecology
 - a net increase in the area of occupation and condition of BGW
 - to enhance ecosystem function and connectivity across the target landscape
 - establish a long-term landscape management program with potential for self-perpetuation
 - incorporate community engagement, capacity building, ownership and financial incentive as a foundation of the program
- Options for **Rice Flower** A&AM include:
 - seed and vegetative material collection
 - germination trials to understand seed dormancy and germination mechanisms
 - genetic sequencing
 - propagation of individuals from seed and vegetative material

- translocation to a secure site
- funds for the management of *in situ* populations on private land such as herbivore fencing
- Options for **Sooty Owl** A&AM include:
 - Experimenting with restoration methods such as different nest box designs
 - Nest box monitoring
 - Project management and reporting

A&AM Proposal 1 - BGW – Bango to Burrinjuck LAMP

Proposal 1 overview

For BGW, we propose the design and delivery of a Local Area Management Plan (LAMP) that:

1. Guides the establishment of a pragmatic, deliverable, landscape-scale conservation initiative to compensate for SAIL impacts
2. Is located near the impact footprint of HumeLink
3. Spans an area historically covered by Box Gum Woodland
4. Seeks to establish ecological connectivity within a currently fragmented landscape
5. Incorporates community engagement, capacity building, ownership and value as a foundation of the program
6. Provides for an indicator species approach, facilitates adaptive management and has clear performance targets
7. Has the potential for self-perpetuation through community engagement

Proposal 1 seeks to prepare and seed-fund a LAMP that aims to re-establish ecological connectivity between Bango and Burrinjuck Nature Reserves (NR) (see Figure 1). The proposed corridor has an indicative distance of 31 - 47 km (yellow hashed lines in **Figure 1**) and would aim to increase ecological connectivity by restoring patches of remnant woodland, or 'stepping stones' along its path (see purple polygons **Figure 1** for existing remnants).

The indicator species model uses the population of a specific species as a proxy for improvement in whole-of-ecosystem function. The most common indicator species are animals, and quantitative information on that species' presence and abundance is used as a surrogate that indicates the quality of the environment around it. The selection of the indicator species is determined by the objectives of the restoration program.

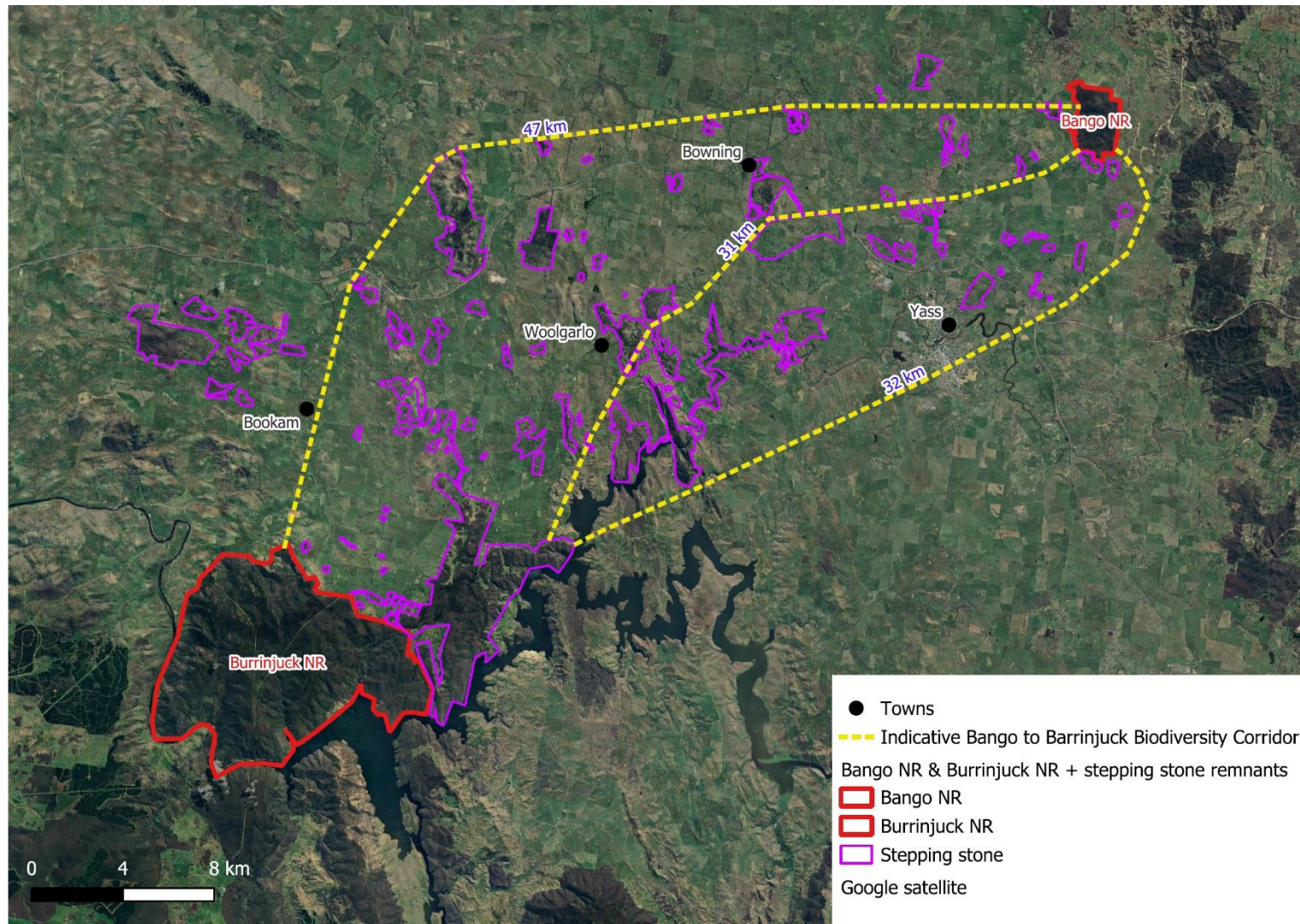


Figure 1 – indicative biodiversity corridor for a LAMP that connects Bango NR to Burrinjuck NR.

LAMP Elements

The key elements of the LAMP are:

- **Scientific review** to determine minimum requirements of a landscape connectivity network aimed at expanding extent of target indicator species populations.
- **Extensive landholder engagement and co-design** to identify a practical and achievable landscape connectivity corridor.
- **Develop a LAMP** including **mapping** to guide targeted strategic management and restoration works, a **Restoration Management Plan**, performance targets and **monitoring plan**.
- **Establish a steering committee** of key stakeholders that meet quarterly to determine how funds will be allocated. This committee might include representatives from:
 - The Ecosystem and Threatened Species (EaTS) team in the NSW BCS
 - The landholder network within the landscape connectivity corridor, including Local Aboriginal Land Councils
 - Landcare
 - Regen Farmers Mutual
 - Transgrid
- Identify and **engage network of landholders**. This might involve:
 - A formal process of educational workshops and mentoring driven by organisations with expertise in landholder engagement and regenerative agriculture such as Regen Farmers Mutual.
 - Co-design of the LAMP with landholders
 - Financial support to facilitate landholders in adjusting their enterprises in a way that ensures future sustainability of restoration actions.
 - Normalising behaviours to promote protection of indicator species and BGW.
 - Engaging indigenous landholders in the LAMP catchment area.
 - Establishing communication networks among landholders so that they can share their experience with the LAMP.
- **Provide seed-funds** to initiate LAMP delivery
- Establish long-term **funding structures** that maximise likelihood of achieving LAMP goals. This would include connecting the network of landholders to emergent sources of green finance such as:
 - Biodiversity Credits arising from the voluntary nature positive markets, both domestic and international
 - Generation of Australian Carbon Credit Units (ACCUs)
 - Partnering with large consumer businesses who are seeking to reduce scope 3 emissions in their supply chain
 - Philanthropy

- **Monitoring program** to measure project success against LAMP performance targets and facilitate adaptive management.

A primary benefit of a LAMP approach to A&AM compared to establishment of additional offsets is the prospect of delivering landscape-scale outcomes over a much larger land area than would be possible under Biodiversity Stewardship Agreements (BSA).

A LAMP aiming to design and deliver the Bango to Burrinjuck Biodiversity Corridor aligns with an existing project driven by Landcare's Yass Area Network (YAN) called [Habitat Hops](#).

Funding and delivery model

For the purposes of costing the LAMP we have assumed the following:

- 2.5 FTEs across BCS, Transgrid and Landcare for a period of 3 years to undertake LAMP design, delivery, monitoring, reporting, GIS mapping and geospatial analysis, statistical analysis, project management, coordinate landholders, coordinate volunteers, and provide expert ecological advice.
- 0.5 FTE in Landcare for a period of 7 years (years 4-10) to manage ongoing delivery and funds disbursement.
- Engagement of consultants with expertise in agro-economy and regenerative agriculture to build and maximise landholder participation.
- Supply and installation of 57,500 local provenance tube stock
- Monitoring equipment (monitoring labour to be provided by landholders and funded staff)
- Ongoing costs such as software licenses, safety advice, contingency and project management
- Approximately 50 landholders would contribute to LAMP delivery

We estimate the total cost of design and delivery of a LAMP that creates a biodiversity corridor connecting Nature Reserves (NR) such as Bango NR and Burrinjuck NR to be **\$6,318,000.00** (see sheet two in attached spreadsheet). The Biodiversity Stewardship Payment Fund (BSPF) or a similar trust fund mechanism could be investigated as a model for distributing funds over the life of the program.

Justification

Our proposal to prepare, fund and deliver a LAMP targeting BGW restoration via an indicator species model is **additional** to the offsets being provided for impacts of the HumeLink project upon BGW because it:

- Provides a framework and funding for the **restoration of 477.91 ha of BGW** through a landscape-scale ecological connectivity project
- Seeks to establish **biodiversity connectivity** between two nature reserves separated by 31 - 47 km.
- Seeks to build knowledge and capacity of biodiversity conservation and restoration initiatives within the local community by establishing a network of landholders who are committed to implementing, promoting and stewarding the LAMP.
- Has potential to become a long-term self-sustaining community conservation model that delivers positive habitat management and restoration outcomes beyond the scope of the LAMP.

Our proposal for **BGW is appropriate** because:

- It is costed to deliver a biodiversity corridor **within the same IBRA subregion** as the impact site
- The biodiversity corridor is planned within a **landscape historically covered by BGW**
- The LAMP proposal is a **landscape scale project** to match the HumeLink footprint.

A&AM Proposal 2 - Rice Flower – genomically diverse seed collection strategies

Proposal 2 overview

For Rice Flower, we propose a program to undertake seed and vegetative material collection and propagation, followed by genetic analysis to determine if translocation is suitable, and if so, how a translocation plan would be designed to maximise genetic diversity. Additionally, we have costed for either *in situ* management of a population or translocation of an *ex situ* population to a site secured by an in-perpetuity conservation covenant. The option chosen would be determined by the results of the genetic analysis and consultation with the Accountable Officer for Rice Flower.

Elements

Undertake the following conservation management actions:

- seed collection and vegetative tissue sampling across the known distribution of the Rice Flower (i.e. not confined to the area subject to direct impact).
- genomic sampling and sequencing to comprehensively assess the level of genomic diversity present across the species' natural distribution, which will inform seed collection strategies.
- sampling, storing and testing of collected germplasm material to guarantee representation of the species *ex situ*, and improve our understanding of seed viability and germination traits.
- seed and vegetative propagation with the aim of growing 50 juveniles.
- translocation of propagated individuals to a site secured by an in-perpetuity conservation covenant with the aim of establishing 50 individuals to sexual maturity OR management of existing *in situ* populations of Rice Flower on McPhersons Plain.
- Annual reporting to the BCD accountable officer for Rice Flower.

This proposal will:

- contribute to our understanding of the reproductive and genetic health of the species, which is vital information in supporting a species that is facing rapid decline and adverse effects of anthropogenic development.
- guide seed sourcing strategies to support genomically representative collections for *ex situ* seed banking and conservation actions (e.g., translocation).
- provide recommendations on the seed germination traits that contribute to the likelihood of plant recruitment *in situ* as well as *ex situ* propagation success.
- develop guidelines that support conservation efforts and future management actions leading to the long-term survival of the species (e.g., translocation, population supplementation, living collection propagation).

The value of the genomic sampling is threefold. Firstly it applies the principle of '*first do no harm*' by ensuring we don't undertake a translocation which introduces alleles that swamp distinct populations, thereby inadvertently reducing genetic diversity and the species' overall resilience. Second, it ensures that if a translocation is undertaken, we select the individuals with maximum genetic diversity and position them

in a way which is most likely to result in cross-pollination. And thirdly, it will determine if *Pimelea bracteata* is in fact a distinct population from its nearest relative *Pimelea ligustrina*.

Funding and delivery model

We estimate the total cost of delivery of the above conservation management actions for Rice Flower to be approximately **\$271,900.00** (see sheet three in attached spreadsheet). This costing is based on the proposal developed by Dr Nathan Emery (also attached) of the Botanic Gardens of Sydney (BGS) and would engage two of their expert teams, including:

- Seedbank & Conservation Collections (SBCC), and
- Research Centre for Ecosystem Resilience (ReCER).

Transgrid have also budgeted translocation costs such as fence installation, fence maintenance, weed control, watering and monitoring. However, we note that the detailed design of any translocation program is contingent on the results of the genomic analysis undertaken by BGS, which may advise against a translocation. Instead, we have costed management actions for the preservation of an existing *in situ* population as a proxy for translocation cost. The funds that have been costed for management of an *in situ* population of Rice Flower could be reallocated to translocation of an *ex situ* population. However, all major management decisions would be made in consultation with the Accountable Officer for the species.

Justification

Our proposal for Rice Flower is **additional** for the following reasons:

- It would undertake genetic analysis and seed collection on a **representative sample** of the of the **entire population** of Rice Flower, not just the impact population.
- It would result in **knowledge** about how to relax the species' **physiological dormancy** and then **trigger germination**. Rice Flower is a notoriously difficult species to propagate from seed.
- It will determine if *Pimelea bracteata* is a distinct population from its nearest relative *Pimelea ligustrina*.

Our proposal for Rice Flower is **appropriate** for the following reasons:

- It pertains to both the **impact population** and the **entire population**.
- It indirectly addresses one of the key threatening processes (dieback) by enabling the **maintenance of genetically diverse ex situ populations**.
- The results of the genetic analysis would be used for **adaptive management**

A&AM Proposal 3 – Sooty Owl – Breeding Habitat Restoration

Proposal 3 overview

For Sooty Owl, we are proposing to implement habitat restoration actions at a yet-to-be determined site. Transgrid would seek to deliver all restoration actions at a site secured by an in-perpetuity conservation covenant (such as a Biodiversity Stewardship Agreement or Conservation Agreement under the *Biodiversity Conservation Act 2016*). Restoration activities would focus on artificial measures to reinstate Sooty Owl breeding habitat including different artificial nest hollow designs. The efficacy of the restoration measures would be monitored and analysed by funding a PhD student over the three-year project timeframe.

Elements

The restoration might include the following, however, detailed design of any conservation actions would be undertaken in consultation with the BCD Accountable Officer for Sooty Owl and any future PhD student:

- Installation and monitoring of the artificial nest hollow designs at a site secured by an in-perpetuity conservation covenant. Artificial nest hollow designs might include:
 - A **chainsaw cavity and entrance** where the arborist uses a chainsaw to carve out a suitably sized cavity and entrance in a tree limb or trunk. The carving would occur into mature trees with >40cm trunk diameter.
 - A **chainsaw entrance to existing cavity** where the arborist creates access to a previously inaccessible, internal tree cavity.
 - A completely artificial **plastic nest box** (such as those made by [Habitat](#)) where a thermally stable, manufactured nest box is attached to a tree. Attachment of nest boxes would occur through a mounting bracket system, which is designed to enable the tree to scar over the bracket. The habitat nest box itself involves a modular, stackable design and multiple entry configurations suitable for the species.
 - A completely artificial, **traditional plywood nest box**. This would involve mounting nest boxes with pre-determined dimensions on existing trees using the Habisure system. The standard nest box would include a hinged, sloping lid, and a suitably sized entrance hole and incised ladder for easy access.
- **Funding a PhD student** to design the study, monitor Sooty Owl response to restoration management actions and analyse results. The study would include assessment of relative efficacy of each active restoration management action. Note that while research into restoration management actions may not be appropriate for entities such as BGW, we consider it to be essential for Sooty Owl given it is listed as an SAI entity under Principle 4, which states that the *‘species or ecological community is unlikely to respond to measures to improve its habitat and vegetation integrity and therefore its members are not replaceable.’* Additionally, the Biodiversity Conservation Trust’s Guidelines on Artificial Hollows and the NSW Recovery Plan for Sooty Owl both state *‘The potential for artificial hollows (nest-boxes) to fast-track habitat development for owls should be investigated.’* Therefore, research is required to uncover methods that may improve the species habitat.

During consultation with the EaTS in May and June 2024, they indicated the preferred management action for Sooty Owl would be installation of nest boxes because additional management actions, such as

supplementary planting or installation of coarse woody debris, could interfere with scientific robustness of monitoring efforts.

Funding and delivery model

We estimate the total cost of delivery of the above restoration actions for Sooty Owl to be approximately **\$473,900.00** (see sheet four in attached spreadsheet).

Justification

Our proposal for Sooty Owl is **additional** for the following reasons –

- It will **generate knowledge** about the efficacy of untested habitat restoration methods for the species

Our proposal for Sooty Owl is **appropriate** for the following reasons –

- It aims to **address one of the key habitat constraints** for the species, being large cavities for breeding
- It contains a **research component**, which is consistent with listing as SAI under Principle 4

Summary of A&AM proposals

In summary, Transgrid is proposing a total of **\$7,063,800.00** of additional and appropriate measures to compensate for 524.91 ha of likely SAI to three SAI entities as a result of HumeLink's development footprint (See Table 2). This is equivalent to **\$12,808.00** per ha of SAI.

Table 2 – Summary of the value of additional and appropriate measures proposed to compensate for HumeLink's likely serious and irreversible impact.

SAI entity	SAI impact (ha)	Additional and appropriate measure (\$)	Cost per ha for A&AM
Box Gum Woodland	477.91	\$6,318,000.00	\$13,220.00
Rice Flower	4.76	\$271,900.00	\$57,121.00
Sooty Owl	68.81	\$473,900.00	\$6,887.00
Total	551.48	\$7,063,800.00	\$12,808.00

For further detail on how costings were calculated, please refer to the attached spreadsheet and zip folder containing proposals and quotes, or contact Mal Barnes (mal.barnes@transgrid.com.au; +61 418 931 388)

Yours faithfully,



Daniel Whaite

Biodiversity Manager

2 September 2024