Hunter Power Project

Biodiversity Management Plan

Amended Final 2

14 January 2022

Hunter Power Project

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Client Name:	Snowy Hydro Limited
Project Manager:	Karl Ivanusic
Author:	Emma Weatherstone
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Jacobs Group (Australia) Pty Limited
ABN 37 001 024 095
Level 4, 12 Stewart Avenue
Newcastle West NSW 2302 Australia
PO Box 2147 Dangar NSW 2309 Australia
T +61 2 4979 2600
F +61 2 4979 2666
www.jacobs.com

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Amended Final	23 December 2021	Updated in response to DPIE comments	E Weatherstone C Whyte	M Consterdine C Thomson	M Luger	K Ivanusic
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Glossary of terms

Term	Definition
APZ	The Asset Protection Zone is a 10-metre buffer positioned adjacent to the Project Site boundary, where the site adjoins existing vegetation. This APZ has been planned to provide a fire protection zone.
Biodiversity Assessment Method	The Biodiversity Assessment Method (BAM) is the assessment manual that outlines how an accredited person assesses impacts on biodiversity at development sites and stewardship sites. It is a scientific document that provides: ▪ A consistent method for the assessment of biodiversity on a proposed development or major project, or clearing site ▪ Guidance on how a proponent can avoid and minimise potential biodiversity impacts ▪ The number and class of biodiversity credits that need to be offset to achieve a standard of 'no net loss' of biodiversity.
Direct impact	An impact on biodiversity values that is a direct result of vegetation clearance and loss of habitat for a development. It is predictable, usually occurs at or near to the Project Site and can be readily identified during the planning, design, construction, and operational phases of a development.
Ecological community	An ecological community is a naturally occurring group of native plants, animals and other organisms living in a unique location. Ecological communities can be listed as threatened under the EPBC Act and/or BC Act.
Habitat	An area or areas occupied, or periodically or occasionally occupied, by a species, population, or ecological community, including any biotic or abiotic component.
Indirect impact	An impact on biodiversity values that occurs when development related activities affect threatened species, threatened species habitat, or ecological communities in a manner other than direct impact. Compared to direct impacts, indirect impacts often: ▪ Occur over a wider area than just the site of the development ▪ Have a lower intensity of impact in the extent to which they occur compared to direct impacts ▪ Occur off site ▪ Have a lower predictability of when the impact occurs ▪ Have unclear boundaries of responsibility.
MNES	A matter of national environmental significance (MNES) protected by a provision of Part 3 of the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).
Mitigation	Action to reduce the severity of an impact.
Plant community type	A NSW plant community type identified using the plant community type (PCT) classification system. The PCT classification was created in 2011 by consolidating two existing community-level classifications: the NSW Vegetation Classification and Assessment database; and the Biometric Vegetation Types database used in NSW regulatory programs. The PCT classification is now maintained in the BioNet Vegetation Classification application. It is a way to classify vegetation types.
Project Site	The area of land that is directly impacted by the development, including access roads, and areas used to store construction materials.
Study area	The Project Site and any other areas surveyed and assessed for biodiversity values which may be subject to indirect impacts.

Term	Definition
Threatened species	A species listed under the NSW *Biodiversity Conservation Act 2016* (BC Act), NSW *Fisheries Management Act 1994* (FM Act) or EPBC Act.
Threatened ecological community	A community of different species associated with one another and sharing the same habitat, that is listed under the NSW *Biodiversity Conservation Act 2016* (BC Act), NSW *Fisheries Management Act 1994* (FM Act) and Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Threatened ecological communities are listed as endangered or critically endangered under the BC Act, or may be listed as vulnerable, endangered, or critically endangered under the EPBC Act.

Abbreviations

Abbreviation	Definition
APZ	Asset Protection Zone
BC Act	*Biodiversity Conservation Act 2016* (NSW)
BCS	Biodiversity Conservation and Science Directorate
BDAR	Biodiversity Development Assessment Report
CEMS	Construction Environmental Management Strategy
DAWE	Department of Agriculture, Water and the Environment
DPIE	Department of Planning, Industry and Environment (NSW)
TEC	Threatened ecological community
EESG	Environment, Energy and Science Group (NSW DPIE)
EIS	Environmental Impact Statement
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Federal)
EWMS	Environmental Work Method Statement
PCT	Plant community type
SAII	Serious and irreversible impacts
TEC/s	Threatened Ecological Communities

1. Introduction

1.1 Background and purpose

Snowy Hydro Limited (Snowy Hydro) ('the Proponent') proposes to develop a gas fired power station near Kurri Kurri, NSW ('the Project') (Figure 1-1). The Project involves the construction and operation of an open cycle gas turbine power station and electrical switchyard, together with other associated infrastructure.

The major supporting infrastructure that is part of the Project will be a 132 kilovolt (kV) electrical switchyard located within the Project Site. The Project will connect into the existing 132 kV electricity transmission infrastructure located adjacent to the Project Site. Other supporting infrastructure elements of the Project include:

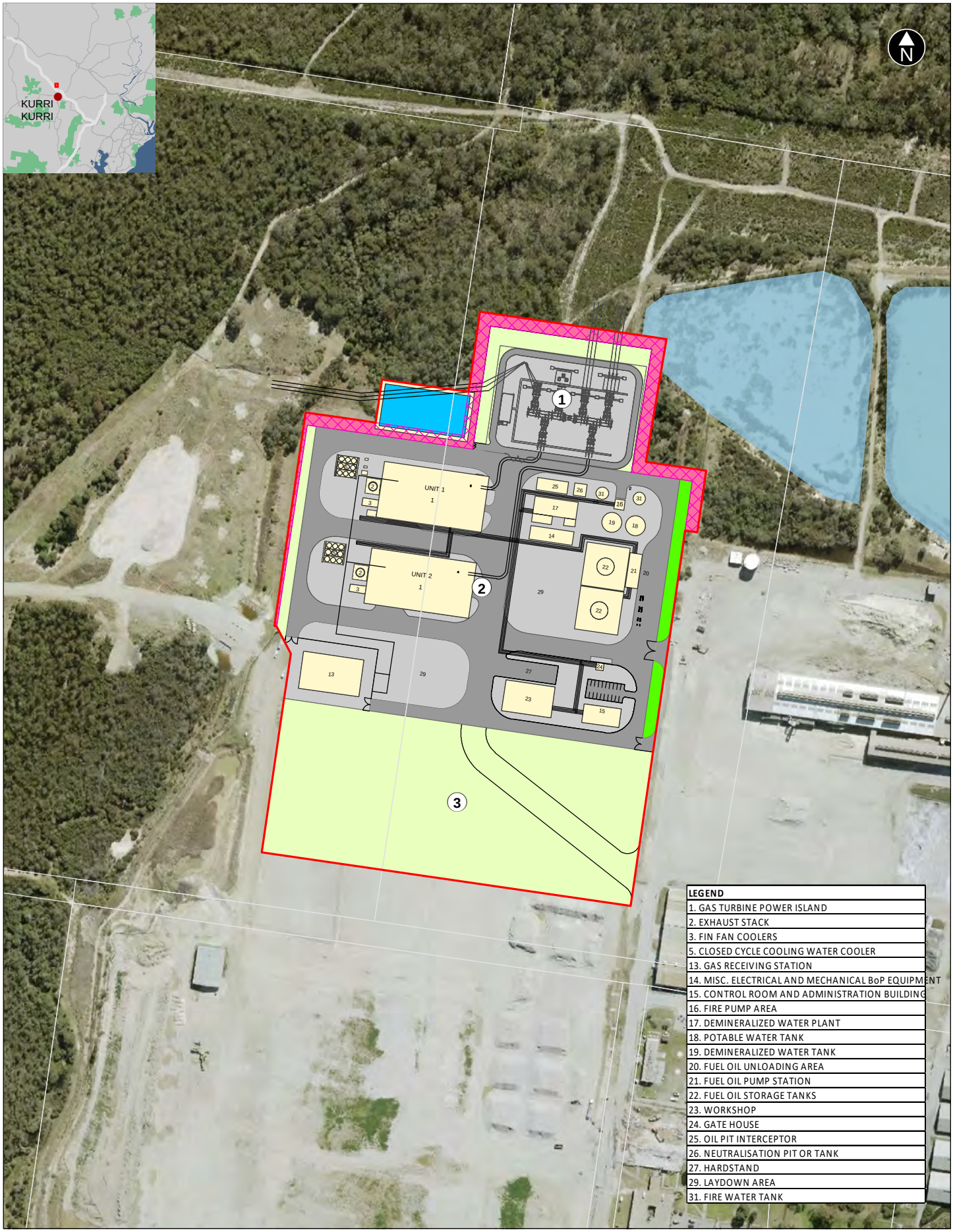
- Storage tanks and other water management infrastructure
- Fire water storage and firefighting equipment such as hydrants and pumps
- A permanent stormwater retention basin
- Maintenance laydown areas
- Diesel fuel storage tank(s) and truck unloading facilities
- Site access roads and car parking
- Office/administration, amenities, workshop/storage areas.

Construction activities are anticipated to commence early 2022 and the Project is intended to be operational by the end of 2023.

This Biodiversity Management Plan (BMP) forms part of the Construction Environmental Management Strategy (CEMS) for the Project and has been prepared to manage Project impacts to biodiversity during construction activities.

The plan outlines potential impacts to biodiversity and details the management strategies, actions, and controls to be used to mitigate these impacts. All works are to be implemented in accordance with the management strategies set forth in this BMP by all parties, either directly employed by Snowy Hydro or subcontracted, to pre-construction and construction activities.

While the entire Project Site is subject to this BMP, the management strategies of the BMP apply primarily to the switchyard area and provisional stormwater basin area, as these are the only locations within the Project Site where vegetation exists (Figure 1-1).



Project site
Asset protection zone
Provisional stormwater basin
Sealed roadway
Crushed rock
Landscaping
Grass / Road base
Existing waterbodies
Existing cadastre
1 Project Switchyard Area
2 Project Plant Area
3 Project Buffer Area

0 100 200 m

1:4,000 at A4
GDA2020 MGA Zone 56

Data sources:
Jacobs
Metromap (Aerometrex) 2020
NSW Spatial Services

Figure 1-1 Site Layout

Date: 25/03/2021

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1.2 Construction activities

The Project construction stages include, but are not limited to, the following:

- Pre-construction preparatory activities including dilapidation studies, surveys, investigations, and access
- Site earthworks
- Pile foundations
- Underground services
- Balance of plant
- Switchyard – Electrical
- Primary installation of gas turbine and generator
- HV electrical installation
- Site surfacing.

The majority of these stages are unrelated to biodiversity. Works conducted in the switchyard area and stormwater basin area are the focus of this BMP. In this context, the pre-construction and construction site earthworks stages will impact on biodiversity and are the focus in this BMP.

Tasks specific to these stages will include, but are not limited to:

- Installation of exclusion fencing, noting that that the fencing will be equal to, or smaller than, the Project Site delineated in the Environmental Impacts Statement (EIS) and Biodiversity Development Assessment Report (BDAR). Exclusion fencing will delineate vegetation to be retained outside the limits of clearing
- Confirmation on whether all areas of native vegetation need to be cleared (as per EIS) or whether some areas can be avoided due to detailed design refinements. If any areas can be avoided, then exclusion/protective fencing will be erected
- Spotter catcher will check all trees and be present during vegetation removal
- Cutting/ knocking over trees and brush cutting of vegetation
- Chipping of woody material and stockpiling for reuse or removal off site
- Stripping of topsoil, where required within the northern areas of the Project Site and stockpiling for reuse
- Earthworks to grade the site, located towards the North West corner or the Project Site
- As part of the earthworks stage, the Principal Contractor may also excavate the provisional sediment/stormwater basin and associated discharge/overflow to the creek with suitable scour protection. This will require a detailed design and an Environmental Work Method Statement (EWMS) to be compiled by the Principal Contractor.

1.3 Objective

The objective of this BMP is to reduce the impact of the pre-construction and construction activities on biodiversity at and surrounding the Project Site through:

- Identifying the key biodiversity issues that require control measures
- Developing strategies to manage impacts on biodiversity and implementing those strategies
- Assigning responsibilities for impact management
- Providing sufficient information to assist with auditing the implementation of the BMP
- Establishing a biodiversity monitoring program and management measures
- Maximise workers' awareness of biodiversity values and avoid or minimise potential impacts to biodiversity.

This BMP is part of the Construction Environmental Management Strategy (CEMS) and includes mitigation and management measures in Section 3.

1.4 Associated management plans

There are interrelationships with other plans that provide associated information relevant to environmental management of biodiversity impacts, these include:

- Construction Environmental Management Strategy (CEMS) - demonstrates systems and procedures to ensure that controls are established and maintained to manage the potential environmental impacts, compliance, and performance through the construction phase of the Project in accordance with applicable legislative requirements. It utilises information gathered in the planning phase through to the operational phase to ensure information continuity and transfer between the Proponent, Principal Contractor, and all teams working on each phase of the Project. Legislation and regulations related to the Project are also referenced within the CEMS
- Water Management Plan – includes mitigation measures to minimise erosion and sedimentation.

1.5 Infrastructure Approval conditions

The biodiversity management requirements identified in the Infrastructure Approval conditions for the BMP are listed in Table 1-1. A cross reference is also included to indicate where the conditions and requirements are addressed in this BMP. Note that operational aspects of the Infrastructure Approval condition have not been included.

Table 1-1: Infrastructure Approval conditions

Condition	Requirement(s)	Where addressed
B33	This BMP is a requirement of the Infrastructure Approval Condition B33, and must include the following:	
	(a) be prepared by a suitably qualified and experienced biodiversity expert/s	Document history
	(b) be prepared in consultation with the BCS	Section 1.6
	(c) Describe the short, medium and long-term measures to be undertaken to manage vegetation and fauna habitat on the site	Section 3
	(d) Describe how biodiversity offsets required in condition B34 will be retired	See condition B34 below
	(e) Describe measures to be implemented within the site to minimise:	
	(i) the amount of clearing	Section 3
	(ii) impacts on fauna, including undertaking pre-clearance surveys and maximising the salvage of resources for habitat enhancement	Section 2.4 and Section 3
	(iii) impacts on threatened flora and fauna species or ecological communities within the development footprint and its surrounds	Section 2.1, Section 2.2, Section 2.3 and Section 2.4
	(iv) the spread of weeds and fungal pathogens	Section 2.5

Condition	Requirement(s)	Where addressed
	(v) the generation and dispersion of sediment to watercourses	Section 2.8
	(vi) light spill from night works	Section 3
	(f) Include a program to monitor, evaluate and report on the effectiveness of the measures	Section 4
B34	Infrastructure Approval Condition B34, states that prior to the commencement of any construction activity that will impact on any of the vegetation communities or species identified in the Project Site, Snowy Hydro must retire biodiversity credits of a number and class specified in consultation with the BCS and to the satisfaction of the Biodiversity Conservation Trust. The retirement of these credits must be carried out in accordance with the NSW Biodiversity Offsets Scheme and can be achieved by:	
	(a) Acquiring or retiring 'biodiversity credits' within the meaning of the *Biodiversity Conservation Act 2016*	Not applicable due to selection of option (b) below
	(b) Making payments into an offset fund that has been developed by the NSW Government	To satisfy condition B34 the Proponent has elected to retire the biodiversity credits in accordance with B34(b) and will be making payments into the offset fund developed by the NSW Government.
	(c) Funding a biodiversity conservation action that benefits the threatened entity impacted by the development, consistent with the 'Ancillary Rules: Biodiversity conservation actions'	Not applicable due to selection of option (b) above
	Written evidence of the retirement of these credits must be provided to the department prior to commencing construction activity.	Written evidence will be provided to the Department.

1.6 Consultation with agencies

Per Approval Condition B33(b), this management plan was prepared in consultation with the Biodiversity Conservation Division (BCD) of DPIE (formerly BCS). A summary of this consultation is provided in Table 1-2.

Table 1-2: Consultation record

Agency	Feedback	Response and section reference
BCD (formerly BCS)	**1. Additional fauna management measures should be considered for the tree clearing protocols.** Table 3-1 Management and mitigation measures in the Biodiversity Management Plan (BMP) outlines the management measures which are to be implemented to minimise the impacts of the vegetation clearing on fauna. A Vegetation Pre-clearing Checklist and a Vegetation Clearing (during works) Checklist are presented in Appendices 1and 2 respectively. BCD considers that additional tree clearing protocols should be added to the BMP to ensure clearing activities at the site follow best practice methods. These protocols are described below.	
	Recommendation 1 ▪ Scheduling the clearing works for a time of year to avoid the breeding seasons of identified potential threatened species and other fauna that may breed on site.	There is no scope to alter the schedule of clearing or the commencement of construction for the Project. Further to this, there are very limited opportunities for threatened fauna species to breed on the site, due to a paucity of tree hollows and logs. The pre-clearing survey will target identification of any constructed bird nests on the site to be avoided or managed during the clearing works to further ensure that impacts to breeding fauna can be avoided or mitigated. Amendments have been to Table 3-1 to address the recommendations specifically.
	▪ Comparative habitat assessments should be conducted on clearing sites and proposed release sites to ensure that habitat features are available in the released sites.	All vegetation to be cleared borders an extensive area of comparative habitat in the proposed Regrowth Kurri Kurri offset area which will be maintained and managed by others. All fauna will be released at sites with suitable habitat features and vegetation composition to what has been removed. Table 3-1 has been updated.
	▪ Release sites should be identified and mapped prior to clearing and all appropriate approvals granted by the landholders	All release sites will be in vegetation at least 100 m north of the Project Site, approval will be obtained from the landowner (if required) prior to release. All locations will be captured by a handheld GPS unit as per updated Table 3-1.
	▪ Tree clearing should not be conducted above 35°C for the interests of animal welfare	Noted. This additional control has been added to Table 3-1.

Agency	Feedback	Response and section reference
	▪ Communication with rescue agencies and local veterinarians prior to the commencement of clearing to confirm the availability of resources for any captured/injured fauna that is unable to be released	Noted. This additional control has been added to Table 3-1.
	▪ Clearing should be conducted sequentially and directionally towards areas of refuge to prevent the creation of vegetation islands	Noted. This additional control has been added to Table 3-1.
	▪ Ensure that trees felled are positioned so that hollows are facing upwards and out to allow fauna to escape overnight.'	Noted. This additional control has been added to Table 3-1.
	2. How will captured fauna be relocated? Table 3-1 Management and mitigation measures and Appendix 3 (Fauna Rescue and Relocation Procedure) of the BMP provides some details on the protocols to be applied for any captured fauna (including threatened species) during the pre-clearing surveys, such as re-releasing in adjoining habitat, stopping work if a significant species and utilising WIRES or similar organisation etc., however; BCD considers that further details are required. Although BCD generally does not support relocation / translocation of captured threatened fauna due to impacts on resources, potential disease implications, and social disruption of other animals already utilising available habitat, the 'good intentions' of such measures are acknowledged. The proponent should specify in detail what will happen to displace threatened fauna in greater detail, and if it proposes relocation / translocation then the BMP should provide an appraisal of what the potential impacts of such relocations / translocations may be and what measures (e.g. monitoring) will be employed to minimise any detrimental effects on existing faunal populations and adjacent habitat. Any relocation / translocation of wildlife should be done in accordance with 'Translocation operational policy' (DPIE 2019), and translocation of threatened species will likely require a license under section 132 of the *National Parks and Wildlife Act 1974* or a threatened species licence, under Part 2 of the *Biodiversity Conservation Act 2016* if species are being relocated to areas outside the approved development consent area. The BMP needs to include these details.	

Agency	Feedback	Response and section reference
	Recommendation 2 ▪ BCD recommends that the Biodiversity Management Plan should provide a more detailed appraisal of what the potential impacts of any relocations / translocations of displaced fauna (particularly threatened species) may be on adjoining habitat and what measures (e.g. monitoring) will be employed to minimise any detrimental effects on existing faunal populations that utilise such areas	The Project will remove about 1.5 hectares of vegetation in different condition states, including low modified and maintained vegetation below an existing power easement. Of this impact, only around 0.4 hectares exists as intact vegetation with complex structural elements, matures trees and logs that may be occupied by resident or transient fauna. The BDAR discusses the potential, albeit low likelihood of the Common Planigale and Squirrel Glider. The Yellow-footed Antechinus was confirmed in the Project Site, as well as the Common Ringtail Possum. These mobile fauna species are considered likely to successfully disperse into the adjoining habitat outside of the Project Site during the clearing works. Comparable habitat is available and widespread surrounding the Project Site, with expansive areas of contiguous habitat to the north. Any dispersal of a small number of native mammals into this adjoining habitat is considered unlikely to place significant pressure on existing resident fauna, due to the expanse of habitat available. The small area of vegetation to be disturbed (0.4 hectares) will only be occupied by a few individuals of the species discussed. On this basis further mitigation and monitoring of resident fauna in adjacent habitats is deemed not to be required for this Project.
	▪ All relocations and translocations of wildlife must be done in accordance with the 'Translocation operational policy' (DPIE 2019), and any appropriate licensing under the *National Parks and Wildlife Act 1974* or *Biodiversity Conservation Act 2016* be obtained.	It is not proposed to translocate any threatened plant species from the Project Site and therefore a licence to translocate a threatened species under Section 132 of the National Parks and Wildlife Act 1974 is not required. While there may be capture and relocation of fauna outside of the Project Site during the clearing works, this activity will be conducted under the Project approval and will be necessary for the carrying out of the development consent. While the likelihood of a threatened fauna species being captured and requiring relocation to adjacent habitat is considered very low, nonetheless prior to the clearing works, the Proponent will apply for a threatened species licence under Part 2 of the BC Act, to ensure that if this event occurs, that the appropriate licence is in place. Additional detail has been provided to consider impact to displaced fauna (see Section 2.5).

Agency	Feedback	Response and section reference
	3. Weed populations within 200 metres of the area managed under the management **plan should be managed / controlled.** The BMP refers to the management and control of thigh threat weed species, which BCD consider the main environmental weeds within the boundaries of the BMP managed site. If these species, or other environmental weeds occur on adjoining roads or adjacent land within 200 metres of the of the areas the BMP applies to, they represent potential source populations (i.e. seeds) to future or ongoing management of the site. If such weed infestations occur, they should also be managed / controlled, where achievable. This may require a co-ordinated approach with neighbouring landholders, if not on land owned by the proponent. Access and management of environmental weeds not on land owned by the proponent must secure the permission of the relevant owner before undertaking any works, including access.	
	Recommendation 3 ▪ Infestations of all environmental weeds within 200 metres of the areas managed under the Biodiversity Management Plan should be managed / controlled. Management / control of such weeds may need to include a co-ordinated approach with neighbouring landholders, if not on land owned by the proponent.	The location of weeds will be mapped within a 200 metre radius of the Project Site to monitor future possible Project related infestations. Regular follow up and treatment of weeds in adjoining areas of the Project, including vegetation within a 200 metres radius of the Project, where it is evident that the weed infestation has occurred post-clearing and is Project-related. This will be informed by the pre-construction weed mapping exercise. Monitoring and the treatment of weeds will occur for a period of six months post-construction. If post-clearing weed infestations become evident (within a 200 metre radius of the project Site) and are deemed to be Project related, the Proponent will consult with the adjacent landowner to implement control. Table 3-1 has been updated to reflect this additional measure.
	4. Biobanking Assessment Method plots should be used for monitoring vegetation and rehabilitation. Section 1.6 of the BMP acknowledges the requirement of monitoring and evaluating the effectiveness of the measures utilised in the plan to manage biodiversity issues. However, this section along with Table 3.1 and the Appendices provide very little detail to actually how the monitoring will be	

Agency	Feedback	Response and section reference
	carried out other than stating that it will be 'periodic'. BCD assumes that this will involve some form of photo-point (camera) monitoring and recording of vegetation status such as cover, dominant species and rehabilitation success, likely utilising the under random transects method. BCD suggests that the collection of full floristics and structural data will provide a more usable data set, rather than just the dominant species, condition etc. This will provide a more useful data set to explain and describe the site condition, detail competition from other vegetation (i.e. weeds), provide early detection of weediness or identify other management issues and provide a greater resource to explain changes to vegetation structure and plant composition over time. This additional data will also compliment any photo monitoring program that the proponent may employ. BCD recommends that the Biodiversity Assessment Method (https://www.environment.nsw.gov.au/topics/animals-and-plants/biodiversity-offsets-scheme/accredited-assessors/biodiversity-assessment-method-2020), utilising the quadrat method, be used to collect long-term monitoring data on the vegetation of the offset site.	
	Recommendation 4 ▪ BCD recommends that vegetation monitoring is done using the Biodiversity Assessment Method, to be consistent with current best practice.	The Proponent has elected to make payments into the Biodiversity offset fund, in accordance with approval condition B37(B), and therefore does not intend to implement a monitoring program to manage biodiversity issues. Monitoring as described in this BMP is targeted at compliance in accordance with the mitigation and management actions provided in Table 3.1. The series of appendices provided in this BMP are essentially a checklist to ensure compliance with the construction activities proposed. The wording in the BMP has been amended to include the word 'compliance' to clarify the intent of the monitoring that is proposed. The Project impact is very small (0.4 hectares) and occurs on the southern edge of a large expansive area of comparable vegetation. It is not intended to monitor the long-term condition of the vegetation in the adjoining and surrounding area, and the use of the BAM is deemed not to be required.

1.7 Legislation framework

The CEMS reflects current legislation, policies, and strategies at both a Commonwealth and State level, as relevant to the Project.

Key legislation relevant to biodiversity and this BMP are listed below:

- *Environment Biodiversity Conservation Act 1999* (EP&A Act)
- *Biodiversity Conservation Act 2016* (BC Act).

Snowy Hydro are responsible for obtaining EPBC Act approvals relating to the Project. The CEMS and this BMP (if required) will be updated to reflect the EPBC Act approval conditions once received.

2. Ecological impacts

The potential for direct impacts to biodiversity as a result of the Project are limited to the clearing of native vegetation and habitat. The Project will not impact any areas of land that the Minister for Energy and Environment has declared as an area of outstanding biodiversity value in accordance with Section 3.1 of the BC Act.

The Project has the potential to impact on the following biodiversity values:

- Clearance of native vegetation, including the threatened ecological community (TEC) listed under the BC Act- Parramatta Red Gum – Narrow-leaved Apple – Prickly-leaved Paperbark shrubby woodland in the Cessnock-Kurri Kurri area
- Removal of threatened plant species including *Eucalyptus parramattensis subsp. decadens* (Earps Gum)
- Removal of habitat for threatened species including the Southern Myotis, Regent Honeyeater and Common Planigale
- Potential to result in the introduction and spread of weeds
- Potential to introduce or spread disease or pathogens such as the amphibian chytrid fungus, *Phytophthora cinnamomi* and Exotic Rust Fungi
- Impacts to aquatic habitat as a result of sedimentation.

The majority of the Project Site (90 per cent) is located on cleared land. Of the remaining 10 per cent (1.54 hectares), 64 per cent of this land (1.09 hectares) comprises regrowth and ground layer vegetation with maintained power easement or fire protection zones. The impact to the intact vegetation (0.40 hectares) is therefore a minor, as the Project has been deliberately planned to be constructed on the former Kurri Kurri aluminium smelter site.

2.1 Plant community type

Despite avoidance and minimisation measures, the Project will result in the direct removal of some native vegetation (Figure 2-1). This includes the Project Site, and adjacent land required for a 10-metre-wide Asset Protection Zone (APZ). The clearing is approximately 1.54 hectares and consists of the following PCTs:

- Parramatta Red Gum – Narrow-leaved Apple – Prickly-leaved Paperbark shrubby woodland in the Cessnock-Kurri Kurri area (PCT 1633) – 1.49 hectares
- Typha rushland (PCT 1737) – 0.05 hectares.

Around 1.09 hectares a of PCT1633 that occurs within the Project Site is within the existing power easement and APZ where vegetation is regularly maintained. The intact vegetation, outside the power easement, comprises the remaining 0.40 hectares.

2.2 Threatened ecological communities

One Threatened Ecological Community (TEC) listed under the BC Act will be impacted by the Project:

- Parramatta Red Gum – Narrow-leaved Apple – Prickly-leaved Paperbark shrubby woodland in the Cessnock-Kurri Kurri area (PCT 1633) – 1.49 hectares.

The TEC within the Project Site is mostly in low condition (1.09 hectares), represented by native species within maintained power easements and regrowth from previously cleared fire protection zones surrounding the former Kurri Kurri aluminium smelter site.

2.3 Threatened flora

One threatened plant species *Eucalyptus parramattensis* subsp. *decadens* (Earps Gum) listed as vulnerable under both the EPBC Act and the BC Act occurs within the Project Site. The species occurs within vegetation zone 1 of PCT 1633 (Figure 2-2).

The Project will directly impact 23 individuals of the vulnerable species, *Eucalyptus parramattensis* subsp. *decadens* (Earp's Gum), identified within the Project Site. Trees were identified from a range of age classes, from small juvenile trees in regrowth areas within existing power easement (c.1-2 metres tall) to mature trees 8-10 metres tall in intact forest areas. A further 14 trees were identified from a 10-metre buffer surrounding the Project Site that has been allocated for asset protection zone (APZ), and these trees will also be impacted. Therefore, the total impact will be 37 trees (Table 2-1).

Table 2-1: Direct impact to *Eucalyptus parramattensis* subsp. *decadens*

Species name	Common name	EPBC Act	BC Act	Sensitivity to gain class	SAII candidate	Area (ha) in Project Site or direct count
Eucalyptus parramattensis subsp *decadens*	Earp's Gum	V	V	High	No	37 plants

SAII - Serious and irreversible impacts

Of these, there are nine immature trees that occur inside the maintained Ausgrid power transmission easement and which are already subject to approved regular slashing and trimming as required (five within the Project Site and four within the 10-metre APZ buffer).

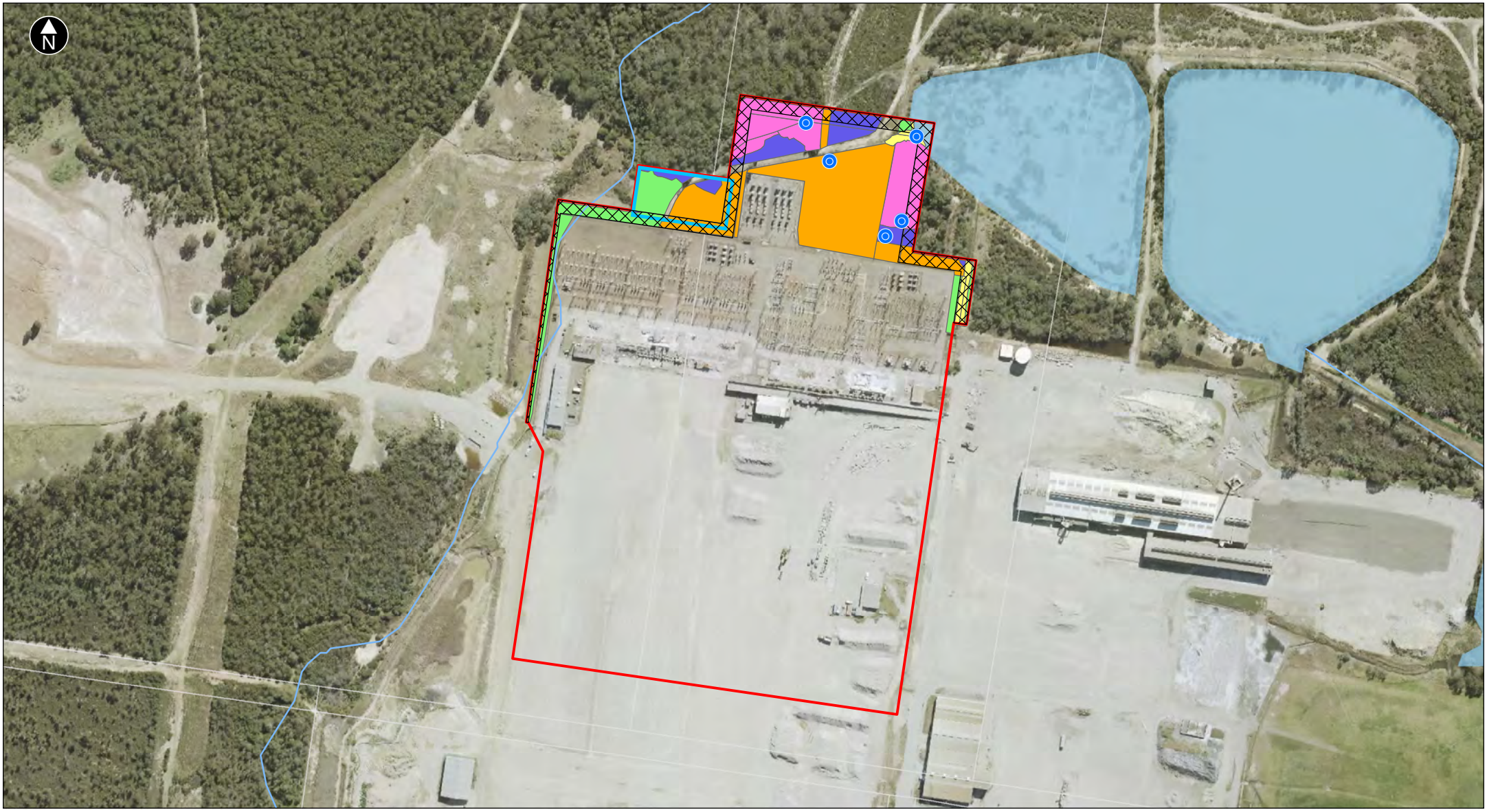

Figure 2-1 Plant community types and vegetation zones

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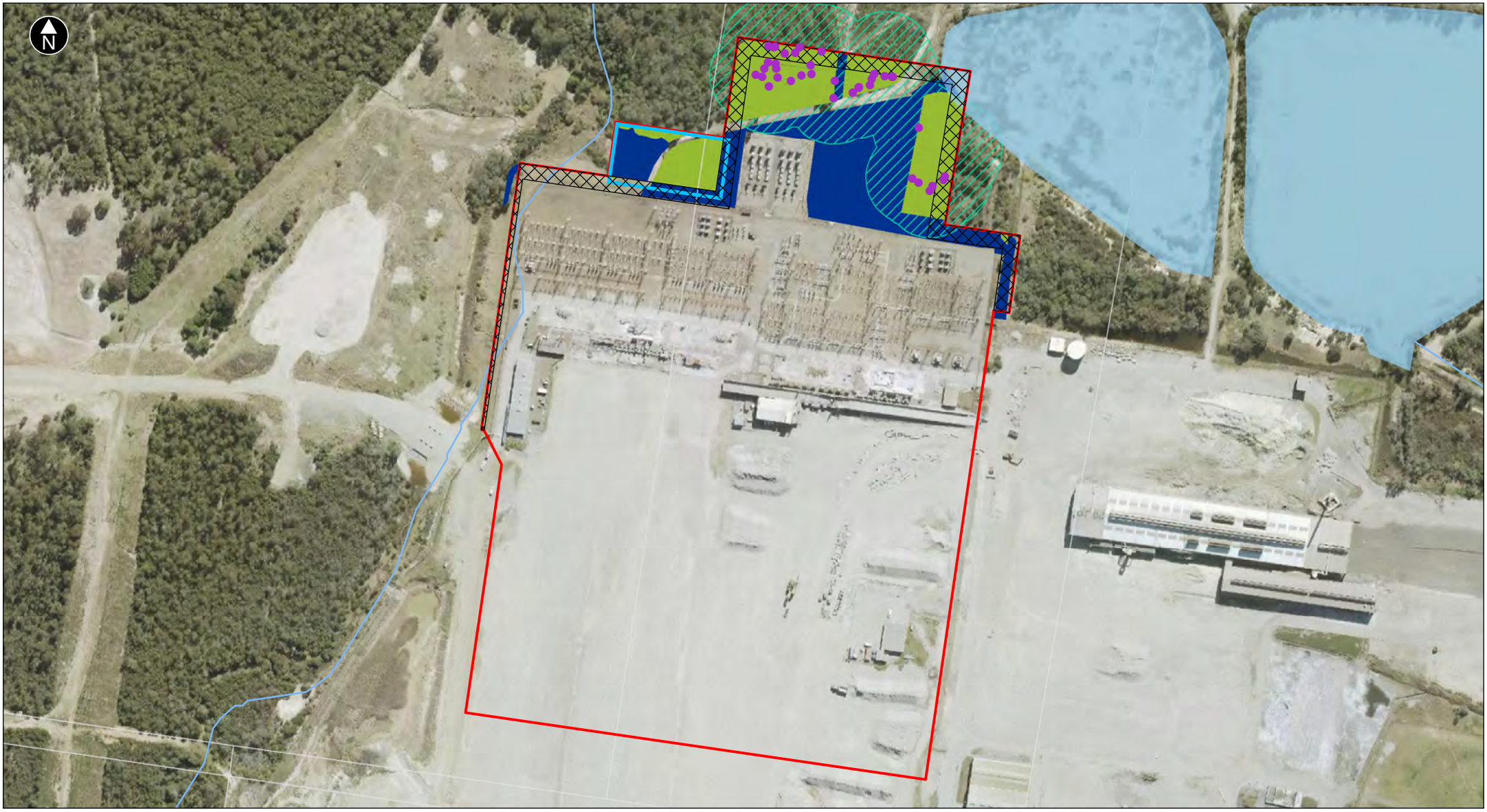

Figure 2-2 Impacts to vegetation and threatened flora

2.4 Threatened fauna

One threatened fauna species, the Southern Myotis (*Myotis macropus*), was positively identified during survey and one threatened fauna species, the Common Planigale (*Planigale maculate),* was assumed present based on the availability of suitable habitat within the Project Site. Both species are listed vulnerable under the BC Act.

Both the Regent Honeyeater (*Anthochaera phrygia*) has mapped breeding habitat and the Swift Parrot (*Lathamus discolor*) has mapped foraging habitat in the woodlands in the vicinity of the Project Site but have not been identified within the Project Site (Figure 2-3). The Regent Honeyeater habitat is intersected by the Project Site. Direct impacts on threatened species habitat associated with the clearing of native vegetation are provided in Table 2-2.

Table 2-2: Direct impacts on threatened species-credit species habitat

Species name	Common name	EPBC Act	BC Act	Sensitivity to gain class	SAII candidate	Area (ha) in Project Site or direct count
Myotis macropus	Southern Myotis		V	High	No	0.40 ha
Anthochaera phrygia	Regent Honeyeater	CE	CE	High	Yes	0.40 ha
Planigale maculata	Common Planigale		V	High	No	0.40 ha

SAII - Serious and irreversible impacts

The Southern Myotis was positively identified foraging over the North Dam (surge pond) which is located to the immediate east of the Project Site. This habitat will not be removed or impacted by the Project, though mitigation techniques will be implemented. The surge pond, and a section of the Typha wetland PCT on the western side of the Project Site, represent potential foraging habitat (pools >3 metres wide). The Project Site contains native vegetation within 200 metres of these suitable watercourses (including areas of PCT 1633, and PCT 1737) and are associated with the Southern Myotis. There are tree hollows associated with the intact vegetation zone (Zone 1 PCT 1633) and therefore potential for roosting by this species. The impact to the Southern Myotis habitat within the Project Site is estimated at 0.40 hectares. This species breeds in early spring, having one young in November or early December, clearing of native vegetation should be avoided during this time.

For the Common Planigale the species polygon included the area of intact woodland associated with Vegetation Zone 1 (0.40 hectares). This habitat contains microhabitat features considered important for this species, including woody debris, tall groundcover vegetation, and structural complexity including shrubs, and trees. In contrast the regrowth and ground layer vegetation has been previously cleared, there is no remaining woody debris, and very simple structural complexity. This habitat is not expected to be preferred by this small mammal species, due to the lack of shelter and cover. This species breeds from October to January, clearing of native vegetation should be avoided during this time.

Based on available literature and current knowledge of habitat preferences for the Regent Honeyeater in the Hunter Valley, the habitat within the Project Site will not be considered important, despite overlaying a portion of the important habitat mapping, as it contains no key foraging species, with exception of low numbers of Stringybark. Therefore, there are no significant impacts predicted to foraging habitat for the Regent Honeyeater as a result of the minor clearing required for the Project. Approximately 0.40 hectares of habitat suitable for the Regent Honeyeater will be impacted by the Project. Breeding mostly occurs during spring and summer, from August to January for this species. Clearing of native vegetation should be avoided during this time.

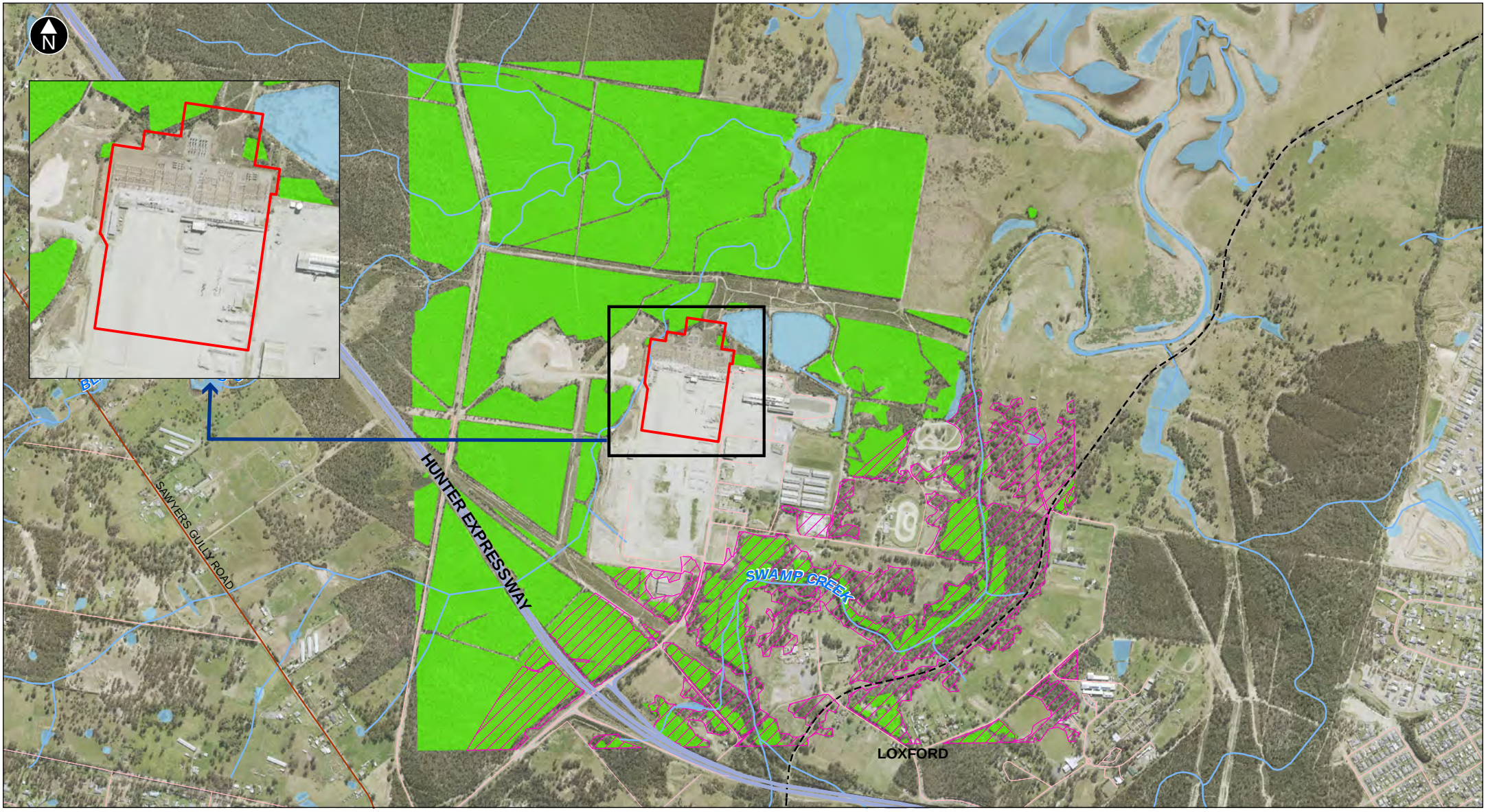

Figure 2-3 Regent Honeyeater and Swift Parrot important areas map

Date: 10/03/2021 Path: J:\IE\Projects\04_Eastern\IS354500\22_Spatial\GIS\Directory\Templates\Figures\KurriKurriEIS\Specialists\Biodiversity\IS354500_KKOCGT_EIS_BDAR_F011_RegentHSwiftP_R2.mxd
Created by : AA | QA by : KI

2.5 Biodiversity offsets

Ecosystem and species biodiversity offset credits based on clearing of all vegetation on the Project Site are shown below.

Table 7: Ecosystem Credit Requirements

Vegetation Community	PCT ID	Credits Required
Parramatta Red Gum – Narrow-leaved Apple – Prickly-leaved Paperbark shrubby woodland in the Cessnock-Kurri Kurri area	1633	13

Table 8: Species Credit Requirements

Species	Credits Required
Earp's Gum	74
Southern Myotis	9
Regent Honeyeater	14
Common Planigale	9

2.6 Consideration of displaced fauna

The Project will remove around 1.5 hectares of vegetation in varying condition, including low modified and maintained vegetation below an existing power easement. Of the vegetation to be impacted, only around 0.4 hectares is intact, having complex structural elements, matures trees and logs which may be occupied by resident or transient fauna. The BDAR discusses the potential, albeit low likelihood of the Common Planigale and Squirrel Glider. The Yellow-footed Antechinus was confirmed in the Project Site, as well as the Common Ringtail Possum. These mobile fauna species are considered likely to successfully disperse into the adjoining habitat outside of the Project Site during the clearing works.

Comparable habitat is available and widespread surrounding the Project Site, with expansive areas of contiguous habitat to the north. Any dispersal of a small number of native mammals into this adjoining habitat is considered unlikely to place significant pressure on existing resident fauna, due to the expanse of habitat available. The small area of vegetation to be disturbed (0.4 hectares) will only be occupied by a few individuals of the species discussed. On this basis further mitigation and monitoring of resident fauna in adjacent habitats is deemed not to be required for this Project.

It is not proposed to translocate any threatened plant species from the Project Site and therefore a licence to translocate a threatened species under Section 132 of the *National Parks and Wildlife Act 1974* is not required. While there may be capture and relocation of fauna outside of the Project Site during clearing works, this activity will be conducted under the project approval and will be necessary for the carrying out of the development consent. While the likelihood of a threatened fauna species being captured and requiring relocation to adjacent habitat is considered very low, nonetheless prior to the clearing works, the proponent will apply for a threatened species licence under Part 2 of the BC Act, to ensure that if this event occurs, that the appropriate licence is in place.

2.7 Weeds and pathogens

Invasive weed species, including high threat weeds such as *Andropogon virginicus* (Whiskey Grass), *Cortaderia selloana* (Pampas Grass) and *Hyparrhenia hirta* (Coolatai Grass), were noted in the edges of the intact forest, regrowth forest and along cleared tracks and land, although in very low abundance within the intact forest. Future weed invasion into adjoining habitats is possible, although, based on observation with the intact areas of forest, this is predicted to be low.

Construction works can result in the spread of weeds, dependent on the type of weeds present on site and the activities being undertaken. Appropriate weed management and disposal minimises the risk of spreading weeds to surrounding areas.

Before pre-clearing and construction activities commence, invasive weed species will need to be identified by a suitably qualified ecologist and removed accordingly from the Project Site. Removal techniques, such as hand removal, will be dependent on the identified weed species, and the appropriate management of weed disposal is to be conducted.

Wherever possible, removal of weeds will be undertaken prior to seed developing, which for most species occurs during the warmer months (summer). Therefore, early spring is generally a suitable time for weed removal. This will reduce the likelihood of propagation material spreading and creating new infestations both within the site and in other areas. Where this is not possible and weed removal must take place at a time when seed production has commenced, seeds are to be removed from plants where possible prior to removal of the plant.

Hand removal will be undertaken where herbicides may impact on crops or native grasses. Hand removal will be undertaken when soils are moist and must be thorough to ensure removal of all roots. Herbicide application should ideally be undertaken during the growing season, however, not during extended dry periods.

Pathogens are agents that cause disease in flora and fauna and are usually living microorganisms such as bacterium, virus, or fungus. Pathogens can be spread on footwear, vehicles and machinery. Precautions are necessary to limit the spread of pathogens during pre-clearance and construction works.

2.8 Aquatic habitat

The Project Site is on the fringe of the Hunter River floodplain. There are no named or unnamed watercourses that intersect the boundaries of the Project Site. However, named watercourses which occur in the landscape buffer include:

- Black Waterholes Creek, located immediately to the west of the Project Site and which flows from south to north
- Swamp Creek, 900 metres to the east of the Project Site, which flows in a northward direction
- Both Black Waterholes Creek and Swamp Creek drain to Wentworth Swamp about 1.5 kilometres north of the Project Site, which drains to the Hunter River at Maitland.

The development will have no direct impacts to any aquatic environments. No significant impacts to important waterways, wetlands and / or key fish habitats are expected. There is a small potential for construction works to increase sedimentation and erosion along drainage lines which has been considered for mitigation.

3. Mitigation and management measures

BMP Mitigation measures to manage potential impacts to biodiversity include:

- Procedures for the identification and protection of retained vegetation, including all vegetation outside and adjacent to the Project Site
- Measures to reduce disturbance to sensitive flora and fauna
- Procedures for the clearing of vegetation and the relocation of flora and fauna, including pre-clearing surveys and hollow-bearing tree identification
- Procedures for dealing with unexpected finds of threatened species identified during construction
- Weed management measures in accordance with the *Biosecurity Act 2015*
- Pathogen management measures to prevent introduction and spread of amphibian chytrid fungus, *Phytophthora cinnamomi* and Exotic Rust Fungi
- Inspection and monitoring requirements
- Working in and around aquatic habitats and riparian zones.

Mitigation measures are to be undertaken during the pre-construction and construction phases. The proposed techniques, timing, frequency, and responsibility for implementing each measure are outlined in Table 3-1. These measures are to be applied as and when any of these activities are undertaken.

It is noted that the total vegetation clearance within the Project Site is yet to be verified, however, the Project is deliberately planned to be constructed on the former Kurri Kurri aluminium smelter site to minimise impacts on the natural environment, including biodiversity values. Confirmation is required to determine whether all areas of native vegetation need to be cleared (as per the EIS) or whether some areas can be conserved due to detailed design refinements. Overall, the Project has sought to avoid and minimise impacts to native vegetation.

The vegetation pre-clearing checklist included in Appendix A, is to be completed by the Principal Contractor to ensure that the actions outlined below have been considered and have been complied with.

Table 3-1: Management and mitigation measures

BDAR mitigation reference number	Mitigation measure	Timing and duration	Responsibility
Procedures for the identification and protection of retained vegetation, including all vegetation outside and adjacent to the Project Site			
B1	The limits of the work zone, areas for parking and turning of vehicles and plant equipment will be accurately and clearly marked out prior to commencement of works. These areas will be located so that vegetation disturbance is minimised as much as possible, and the dripline of trees avoided.	Prior to clearing and during construction	Principal Contractor
B2	Exclusion zones will be established around high-quality vegetation, particularly the location of Threatened Plant Species. Periodic monitoring will be undertaken to ensure all controls are in place and no inadvertent impacts are occurring.	Prior to clearing and during construction	Principal Contractor
B3	Materials, plant, equipment, work vehicles and stockpiles will be placed to avoid damage to surrounding vegetation and will be outside tree driplines.	During construction	Principal Contractor
B4	If any damage occurs to vegetation outside of the nominated work area, Snowy Hydro will be notified so that appropriate remediation strategies can be developed.	During construction	Principal Contractor
B6	Construction personnel are to be informed of the environmentally sensitive aspects of the Project Site, including plans for impacted and adjoining areas showing vegetation communities; important flora and fauna habitat areas; and locations where threatened species, populations or ecological communities have been recorded.	Prior to clearing and during construction	Principal Contractor
Additional mitigation	▪ A qualified ecologist/surveyor is required to set out and clearly identify the clearing limits at the site to ensure that no habitat areas that will be retained adjacent to the Project are not unnecessarily damaged or removed. The clearing limit will be delineated using high visibility temporary fencing (paraweb). ▪ Signage will be erected at all exclusion zones advising persons not to enter and the nature of the exclusion zone, i.e., environmental protection area, weed management area, APZ boundary. ▪ All vegetation requiring protection, areas which are known to contain biodiversity hazards (weeds, pathogens or pests) and exclusion zones are to be clearly identified on construction drawings.	Prior to clearing and during construction	Principal Contractor
Measures to reduce disturbance to sensitive flora and fauna			
B10	Construction crews will be made aware that any native fauna species encountered must be allowed to leave site without being harassed and a local wildlife rescue organisation must be called for assistance where necessary.	Prior to clearing and during construction	Principal Contractor

BDAR mitigation reference number	Mitigation measure	Timing and duration	Responsibility
B11	Where possible, hollows will be cut out of hollow-bearing trees and re-established in large trees to mitigate the loss of hollow habitat on fauna. Re-establishing existing hollows into trees is more likely to encourage uptake than use of artificial nest boxes.	Prior to clearing and during construction	Principal Contractor
Additional mitigation	If hollow-bearing trees are required to be felled, the following additional measures must also be implemented: ▪ A suitably qualified person is to inspect the tree prior to felling and capture/relocate residing fauna as required ▪ Equipment is to be used which allows the trees to be lowered to the ground with minimal impact ▪ Once hollow-bearing trees have been felled, they are to be left for a period of at least 24 hours before being moved to allow any fauna which may be residing in the tree to escape ▪ Ensure that trees felled are positioned so that hollows are facing upwards and out to allow fauna to escape overnight	Prior to clearing and during construction	Principal Contractor
Additional mitigation	Tree removal will be undertaken during daylight hours to minimise the chance of disturbing any foraging bat species such as the Grey-headed Flying Fox and the Southern Myotis.	At all times	Principal Contractor
Additional mitigation	A local wildlife rescue organisation will be made aware of the Project and consulted if any injured protected native animals are found or if any protected native animals are injured as a result of the works.	Prior to clearing and during construction	Snowy Hydro
Additional mitigation	Construction night works will consider measures to minimise light spill to areas surrounding the Project Site that contain native vegetation that may support sensitive fauna. Light spill will be minimised by adhering to Australian Standards (AS/NZ 4282 Control of the obtrusive effects of outdoor lighting), implementing measures such as baffling, downward direction of lighting and minimising the lighting duration.	During construction (night works)	Principal Contractor
Procedures for the clearing of vegetation and the relocation of flora and fauna, including pre-clearing surveys and hollow-bearing tree identification			
Additional mitigation	A suitably qualified ecologist is required to be present at the site during all clearance works. The pre-clearing procedure provided in **Appendix A** and vegetation clearing during works checklist in **Appendix B** will be implemented during construction.	Prior to clearing and during construction	Principal Contractor
B7	A pre-clearing inspection will be undertaken 48 hours prior to any native vegetation clearing by a suitably qualified ecologist and the Principal Contractor. The pre-clearing inspection will include, as a minimum: ▪ Identification of hollow bearing trees or other habitat features	Prior to clearing and during construction	Principal Contractor

BDAR mitigation reference number	Mitigation measure	Timing and duration	Responsibility
	▪ Identification of any threatened flora and fauna ▪ A check on the physical demarcation of the limit of clearing ▪ Implementation of the Erosion and Sediment Control Plan (ESCP) for the worksite, including erosion control structures ▪ The completion of any other pre-clearing requirements required by any project approvals, permits or licences The completion of the pre-clearing inspection will form a HOLD POINT requiring sign-off from the Principal Contractor and a qualified ecologist.		
B8	Vegetation clearing will follow a rigorous process detailed below: ▪ Communication with rescue agencies and local veterinarians prior to the commencement of clearing to confirm the availability of resources for any captured/injured fauna that is unable to be released ▪ Clearing is to be conducted sequentially and directionally towards areas of refuge to prevent the creation of vegetation islands ▪ Non-habitat trees to be cleared first after sign-off of the pre-clearing inspection. ▪ Habitat trees to be cleared no sooner than 24 hours after non-habitat trees have been cleared. A suitably qualified ecologist to be present on the Project Site during the clearing of habitat trees. ▪ Felled habitat trees are to be left on the ground for 24 hours or inspected by the ecologist prior to further processing. All trees felled must be in a positioned so that hollows are facing upwards and out to allow fauna to escape overnight ▪ Tree clearing of habitat trees will not be conducted when the temperature is above 35^0C for the interests of animal welfare ▪ If clearing takes place over multiple days, subsequent clearance pre-clearance surveys will be completed prior to clearing activities so that any fauna which may have returned to the site between works can be found and relocated. ▪ Clearing is to occur outside of the breeding season for threatened species (spring and early summer).	Prior to clearing and during construction	Principal Contractor
Additional mitigation	Clearing of the APZ involves selective fuel reduction and the following measures will be applied when constructing the APZ:	Prior to clearing and during construction	Principal Contractor

BDAR mitigation reference number	Mitigation measure	Timing and duration	Responsibility
	▪ Remove any noxious and environmental weeds if present before pre-clearing commences ▪ Removal of vegetation within the APZ will be treated sensitively, ensuring that there are minimal impacts to the topsoil. This will require removal of all vegetation within the APZ to ground layer using manual techniques such as chainsaws and brush cutters. Particular care in the north-west corner of the Project Site will be required, to ensure no impacts occur to the adjacent vegetation ▪ A canopy will not overhang within two to five metres of the Project Site ▪ No vegetation outside of the Project Site (including the APZ) is to be removed or impacted ▪ Install erosion and sediment controls, such as bunding, along the western edge of the Project, to prevent run-off into the creek line. Further erosion mitigation measures are presented in the Erosion and Sediment Control Management Plan in the CEMS ▪ The inside boundary of the APZ, will be adequately identified using signage specifying the beginning of the 10 metre wide APZ, where the outer boundary of the APZ will be fenced and signed as a "No-go Zone' or "Environmentally Sensitive Area" ▪ Drainage areas are to be confirmed.		
B9 and additional mitigation	A post clearance report will be produced during the clearing phase of the Project and submitted to Snowy Hydro., including any relevant Geographical Information System files, will be produced that validates the type and area of vegetation cleared including confirmation of the number of hollows impacted and the corresponding nest box requirements to offset these impacts. The completed report will include the following: ▪ The name and qualifications of the ecologist or wildlife carer present during clearing ▪ An assessment of the habitat and handling of fauna ▪ Information on clearing operations, dates, areas, and procedures, including inspections immediately prior to tree removal ▪ Type and area of vegetation cleared including confirmation of the number of habitat trees impacted ▪ Live animal sightings, captures, any releases/relocations or injured/shocked wildlife ▪ Any dead animals located ▪ Photographs of any rescued fauna.	During construction	Principal Contractor

BDAR mitigation reference number	Mitigation measure	Timing and duration	Responsibility
Additional mitigation	▪ If a potential incident occurs such as a breach of the clearing limits or exclusion zones, or interaction with fauna, stops works and immediately report the incident to the Site Supervisor who will co-ordinate responsive actions. ▪ The Fauna Rescue and Relocation Procedure outlined in Appendix C of this BMP is to be followed. ▪ Key contacts for fauna emergencies are also provided in Appendix C.	Prior to clearing and during construction	Principal Contractor
Additional mitigation	▪ Identify a proposed fauna release area that is outside of the Project Site and in proximity, ensure the habitat at the release site is comparable with the habitat being disturbed (same vegetation type and contains hollow bearing trees and logs). The release site will be immediately north of the Project Site and a map provided to the project ecologist. ▪ Appropriate approvals (if required) will be obtained (landowner) prior to release of fauna species. ▪ All locations will be captured by a handheld GPS unit.	Prior to clearing and during construction	Principal Contractor
Procedures for dealing with unexpected finds of threatened species identified during construction			
B12 and additional mitigation	A procedure for dealing with unexpected presence of threatened species will be implemented during construction, including cessation of work and notification of the appointed Principal Contractor (or delegate) and Snowy Hydro and determination of appropriate mitigation measures (including relevant relocation measures). Refer to Appendix D for the unexpected finds procedure. Photos and descriptions of threatened species occurring or likely to occur will be included in site inductions.	During construction	Principal Contractor
Additional mitigation	DPIE Environment, Energy and Science group (EESG) will be informed of any previously unidentified threatened species finds (flora and fauna) that are encountered during construction and consulted on management measures proposed for the species. It is advised that DPIE is also to be notified if EPBC Act listed threatened species that were not previously identified are found (refer to Appendix D for the unexpected finds procedure). The notification to these agencies must occur before the end of shift on the day of the discovery so that the correct management strategies can be implemented.	All times	Snowy Hydro
Weed management measures in accordance with the *Biosecurity Act 2015*			

BDAR mitigation reference number	Mitigation measure	Timing and duration	Responsibility
B13, B14 and additional management	Weed management is to be undertaken in areas affected by construction prior to any clearing works, in accordance with the *NSW Biosecurity Act 2015*, to ensure they are not spread to the surrounding environment; including during transport off-site to a licenced waste disposal facility. Weed control will be undertaken by suitably qualified and/or experienced personnel. This will include: ▪ Engage a suitably qualified person to identify, map, and remove priority weeds before clearing for construction, and record location for use in ongoing weed monitoring program. The location of weeds will also be mapped within a 200 metre radius of the Project Site to monitor future possible project related infestations ▪ Manual weed removal in preference to herbicides where suitable ▪ Ensure plant, equipment and clothing are free of soil and vegetative matter prior to being brought to site ▪ During the clearing works, weeds will be disposed and managed appropriately to stop the spread of existing weed species ▪ Place waste containing seed and vegetative material in bags or on plastic sheeting during weed removal, where practicable ▪ Separate weed infested soils from clean soils ▪ Monitor high-risk areas such as access roads, stockpiles and bare ground ▪ Regular follow up and treatment of weeds in adjoining areas of the project including vegetation within a 200-metres radius of the project, where it is evident that the weed infestation has occurred post-clearing and is project-related. This will be informed by the pre-construction weed mapping exercise. Monitoring and treatment of weeds will occur for a period of 6 months post-construction ▪ If post-clearing weed infestations become evident (within a 200 metre radius of the Project Site) and are deemed to be project related, the proponent will seek to consult with and coordinate with the adjacent landowner to control these weeds. Mixing and loading herbicides and cleaning equipment away from waterways and drains.	Prior to clearing and during construction	Principal Contractor
B15 and additional mitigation	All weeds, propagules, other plant parts and/or excavated topsoil material that is likely to be infested with weed propagules that are likely to regenerate will be treated on site or bagged, removed from site and disposed of at a licensed waste disposal facility. Measures will include:	Prior to clearing and during construction	Principal Contractor

BDAR mitigation reference number	Mitigation measure	Timing and duration	Responsibility
	▪ Place waste containing seed and vegetative material in bags or on plastic sheeting during weed removal, where practicable and remove weed infested plant material from the site, preferably on the same day ▪ Dispose of weed infested plant material in accordance with the waste management legislation and approved procedures for the site.		
Additional mitigation	Ensure that any machinery arriving on site be inspected for any foreign soil or plant matter/weed material and be washed down at the premises in which the plant is dispatched from before entering the site. This mitigation measure will be mainly applicable to the pre-clearance works when working with vegetation in the north west portion of the Project Site.	Prior to clearing and during construction	Principal Contractor
Additional mitigation	Manage localised weed issues through the application of herbicides in accordance with the *Pesticides Act 1999 (NSW)* including: ▪ Adhering to the information contained on herbicide labels and material safety data sheets ▪ Use appropriate technique of application for the identified weed ▪ Avoid application of herbicides during times when plants will be dormant, such as winter and the hottest times of day in summer. Avoid application during windy conditions and before rain avoid application near waterways, such as the surge pond and the drainage line. The following planning measures will be considered and implemented as required: ▪ Engage a suitably qualified ecologist to conduct a site inspection and identify the type and location of weeds on the Project Site, and potential sources of weed propagation. ▪ Review the requirements for the management of weeds on the Project Site, particularly as they relate to prohibited matter weeds, identified priority weeds for the region, the relevant Regional Strategic Weed Management Plan and weed management strategies of local authorities. ▪ Ecologist to then advise how to properly remove weeds, with particular emphasis on high threat weeds. High threat weeds such as *Andropogon virginicus* (Whiskey Grass) and *Cortaderia selloana* (Pampas Grass) were identified within the Project Site. Remove and bag any seed heads before removing the plant. Follow up weed control will be required to prevent reestablishment and spread. ▪ *Andropogon virginicus* (Whiskey Grass) can be sprayed using a glyphosate-based herbicide. Follow label directions as to appropriate concentrations.	Prior to clearing and during construction	Principal Contractor

BDAR mitigation reference number	Mitigation measure	Timing and duration	Responsibility
	▪ Manual removal of *Cortaderia selloana* (Pampas Grass) is recommended. Removal of all the crown and root system, which spreads out from the plants, will be required. On larger plants, remove seed heads first and place them in a plastic bag for disposal. Then slash the plant and dig out the crown and roots. Herbicide application is advised before plants establish seeds. Use herbicides only where the risk of causing new infestations is low. *Cortaderia selloana* (Pampas Grass) can be sprayed using a glyphosate-based herbicide. Follow label directions as to appropriate concentrations. ▪ Principal Contractor is to incorporate specific weed management measures and awareness into the site inductions, toolbox talks and pre-starts to ensure that the relevant employees are aware of the requirements ▪ Infestations of all environmental weeds within 200 metres of the areas managed under this BMP will be managed / controlled. Areas north of the watercourse are excluded from weed management as the land is already being manged in perpetuity under an existing offset strategy.		
Pathogen management measures to prevent introduction and spread of amphibian chytrid fungus, *Phytophthora cinnamomi* and Exotic Rust Fungi			
B16 and additional mitigation	▪ All vehicles driving to and from the Proposal Site will follow a protocol to prevent the spread or introduction of phytophthora, namely vehicles will be clean, including the tyres and any equipment. ▪ Minimise work during excessively wet or muddy conditions as pathogens can be spread on footwear, vehicles and machinery, particularly during wet weather or in wet conditions.	During construction (earthworks machinery during vegetation clearance and bulk earthworks/site levelling phases)	Principal Contractor
Inspection and monitoring requirements			
Additional mitigation	▪ The Proponent has elected to retire the biodiversity credits in accordance with approval condition B37(B) and will be making payments into the offset fund. No monitoring other than weed control is proposed. ▪ Internal audits will be undertaken to assess the effectiveness of the management measures and compliance with this BMP and the Infrastructure Approval. Internal audit frequency for the CEMS and all management plans is expected each month through construction, and independent audits will follow the frequency and triggers listed in Section 7.6.3 of the CEMS.	All times	Snowy Hydro

BDAR mitigation reference number	Mitigation measure	Timing and duration	Responsibility
Additional mitigation	All complaints / incidents regarding fauna / flora control will be reported to Snowy Hydro.	Following complaint / incident	All staff
Additional mitigation	Snowy Hydro will investigate all complaints / incidents. Environmental Incident reports will be completed and included in compliance reporting.	All times	Snowy Hydro

BDAR mitigation reference number	Mitigation measure	Timing and duration	Responsibility
Working in and around aquatic habitats and riparian zones			
B5 and additional mitigation	▪ Erosion and sediment measures will be implemented in accordance with the principles and requirements in Managing Urban Stormwater – Soils and Construction, Volume 1 (Landcom, 2004) and Volume 2D (NSW Department of Environment, Climate Change and Water 2008), commonly referred to as the 'Blue Book'. ▪ Sediment and erosion controls, such as bunding and sediment traps, to manage exposed soil surfaces and stockpiles to prevent sediment discharge into waterways, vegetation and fauna habitat. Control measures are further discussed in the CEMS.	Prior to clearing and during construction	Principal Contractor

4. Compliance management

The Construction Environment Management Strategy is the overarching document outlining compliance management and should be referred to together with this plan. Summary level detail of the requirements of Infrastructure Approval conditions C5 through to C13 (Incident notification and reporting related to non-compliance), C14 (notification of commencements) and C21 (Management Plan reviews) are included in this section so that the reader can operate and manage effectively from a reading of this Plan.

4.1 Project team

The Project team's organisational structure and overall roles and responsibilities are outlined the CEMS.

4.2 Monitoring

The Proponent has elected to make payments into the Biodiversity offset fund, in accordance with Infrastructure Approval Condition B34(b), and therefore does not intend to implement a monitoring program to manage biodiversity issues. Monitoring as described in this BMP is targeted at compliance in accordance with the mitigation and management actions provided in Table 3.1. No monitoring other than weed control is proposed.

4.3 Auditing

Internal audits will be undertaken to assess the effectiveness of the management measures and compliance with this BMP and the Infrastructure Approval.

Internal audit frequency for the CEMS and all management plans is expected each month through construction, and independent audits will follow the frequency and triggers listed in Section 7.6.3 of the CEMS.

4.4 Staging and Review of Management Plans

The Department's approval for the staging of management plans into construction and operation phases was provided on 22 December 2021, and is appended to this Plan (Appendix F).

Regular reviews of management documentation will also occur, as well as after certain trigger events. The triggers for further review of this Management Plan include:

- The submission of an incident report under condition C6
- The submission of an audit report under conditions C15 to C19
- The approval of any modification to the conditions of this approval
- A direction of the Secretary (Department of Planning Industry and Environment) under condition A2 of Schedule 2
- As initiated by the Principal Contractor or Snowy Hydro
- Upon the advice of the Environmental Representative.

Within 3 months, unless the Secretary agrees otherwise, of any of the above triggers this document must be reviewed and if necessary, revised to the satisfaction of the Secretary. Where revisions are made, then within 4 weeks of the review the revised document will be submitted to the Secretary for approval, unless otherwise agreed with the Secretary, or within the scope of the Environmental Representative role as set out in condition A23.

4.5 Incident notification

The Principal Contractor will notify Snowy Hydro upon becoming aware of an incident, and Snowy Hydro will then notify the Secretary in writing via the Major Projects website immediately. The notification must identify the development (including the application number and the name of the development.

The key aspects the notification will address are:

- The development and application number (ie 12590060)
- Details of the incident (date, time, location, a brief description of what occurred and why it is classified as an incident)
- How the incident was detected
- When the Proponent became aware of the incident
- Any actual or potential non-compliance with conditions of approval
- What immediate steps were taken in relation to the incident
- Further action(s) that will be taken in relation to the incident
- A development contact for further communication regarding the incident. Unless otherwise stated in the incident notification, this is the Snowy Hydro Approvals Manager on 0409 840 165.

4.6 Non-compliance notification

In the instance of a non-compliance, the Secretary will be notified in writing via the Major Projects website within seven days after the Proponent becomes aware of any non-compliance. Snowy Hydro will lodge the notification.

The Principal Contractor must notify Snowy Hydro whenever it is aware of a non-compliance.

The key aspects a non-compliance notification will address are:

- The development and application number (ie12590060)
- The condition of approval that the development is non-compliant with
- The way in which the development does not comply
- The reasons for the non-compliance (if known)
- The corrective and preventative actions undertaken to address the non-compliance.

For clarity, a non-compliance which has been already been notified as an incident does not need to also be notified as a noncompliance to the Major Projects website.

4.7 Compliance reporting

Compliance Reports of the development will be carried out by Snowy Hydro with the support of the Principal Contractor, and also upon the advice of the Environmental Representative where applicable. Reporting is to be in accordance with, and upon the timing set out in, the *Compliance Reporting Post Approval Requirements (2020*) or subsequent version.

Snowy Hydro must make each Compliance Report publicly available within 60 days of submitting it to the Secretary.

There is an opportunity to request and agree an alternative reporting method and timing with the Secretary to those identified in this section. If sought, this is to be done by Snowy Hydro in consultation with the Department.

4.8 Reporting and incidents

This BMP will be included within the relevant project compliance reports. A post-earthworks report and post construction report will be prepared to account for the variety of biodiversity matters addressed in this plan. These reports, which will be made available to Department of Agriculture Water and the Environment (DAWE) and BCS, will include the following matters:

- Summary of weed control activities undertaken
- Account of all clearing activities including tracking against clearing limits and threatened species habitat limits
- Post-clearing biodiversity management compliance reports
- Account of any relevant incidents and non-compliances.

Environmental incidents relating to biodiversity may include but not be limited to:

- Clearing or damage to vegetation outside of the designated clearing areas
- Unauthorised damage or interference to threatened species or endangered ecological communities
- Unauthorised/accidental death or injury of native fauna within the Project Site.

An environmental monitoring checklist is provided in Appendix E.

5. References

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Appendix A. Vegetation pre-clearance checklist

In completing this form, it is assumed that all necessary environmental assessment and approvals have been completed/attained. All actions/requirements below are required to be completed prior to the commencement of vegetation clearing works in addition to any specific obligations or directives required in the environmental assessment and approval documents.

Project No. / Name:	
Project Location:	
Date:	
Checklist completed by:	

ID	Action/requirement	Status	Comment
1	Identification of weeds within the Project Site and surrounding area by a suitably qualified ecologist		
2	Removal and disposal of weeds from the Project Site prior to vegetation clearance		
3	Establishment of on-site clearing limits by a qualified surveyor		
4	Identification of all habitat requiring protection within clearing limits by a suitably qualified person		
5	All habitat trees required to be cleared have been identified and clearly marked by a suitably qualified person		
6	Establishment of exclusion zones around habitat requiring protection and where necessary, areas known to contain biodiversity hazards (weeds, pathogens or pests)		
7	Erection of signage around exclusion zones		
8	Identification of potential equipment and materials setting and storage locations away from tree protection zones		
9	All equipment inspected and cleaned to remove materials and debris prior to entering site		
10	Environmental control measures including erosion and sediment controls are in place to prevent down-stream biodiversity impacts		
11	Workers associated with clearing activities have been inducted on measures and practices to be implemented during clearing		
12	A pre-clearance ecological survey has been completed by a suitably qualified person within 24 hours of commencing clearing works		

Appendix B. Vegetation clearing (during works) checklist

Project No. / Name:	
Project Location:	
Date:	
Checklist completed by:	

ID	Action/requirement	Status	Corrective actions (if status non-compliant)
1	Exclusion zone fencing and signage, and environmental controls (e.g., erosion control measures) are in good working order and remain fit for purpose		
2	All plant/equipment is being clean and dry prior to entering site		
3	Clearing limits remain clearly visible and are being adhered to		
4	Pre-clearance ecological surveys are being undertaken as required		
5	Where possible, equipment and materials are being set and stored away from tree protection zones		
6	Mulch, topsoil and other materials are being stockpiled separately and stockpile heights are being limited to two metres		
7	Cleared weeds are being stockpiled separately and lawfully disposed of		
8	A suitably qualified person is present when necessary to supervise clearing works and relocate or rescue fauna as required		
9	A register of fauna encountered during the works is being kept and is up to date		
10	All hollow-bearing trees required to be cleared are being inspected by a suitably qualified person prior to being felled		
11	Hollow-bearing trees required to be cleared are felled in a controlled manner by lowering them to the ground		
12	Hollow-bearing trees are to be left for a period of at least 24 hours after being felled, before being moved.		

Appendix C. Fauna Rescue and Relocation Procedure

C.1 Scope

This procedure is applicable to all native and introduced fauna species that are found in the Project Site.

C.2 Purpose

This procedure outlines the correct process to follow for the interaction with any fauna on site during construction activities. In particular the clearing operations. This procedure will cover instances where fauna is shocked, trapped, injured, or if eggs or juvenile fauna are discovered.

C.3 Training

This procedure will be communicated during the site induction, and during toolboxes.

C.4 Responsibilities

The Principal Contractor in conjunction with the consultant ecologist will have the responsibility of ensuring this procedure is followed.

C.5 Procedure

1) Stop work if encounter any fauna within the work area
   - If fauna is not injured allow it to move out of work area. If fauna will not move out of work area due to injury or other reasons, contact the Site Supervisor. The Site Supervisor is to contact the ecologist or WIRES.
2) For Injured Fauna – to be handled by a person licenced to handle fauna
   - Minimise stress to fauna – cover fauna with large blanket or towel and place in a cotton bag and contain the animal inside a pet carrier.
   - Retain the animal in a quiet, warm location that is well ventilated.
   - The Site Supervisor will contact the relevant fauna rescue service and /or local veterinary surgery Contacts are:

WIRES (Rescue Hotline)	**1300 094 737**
RSPCA (Hunter Shelter)	**02 4939 1555**
Cessnock Veterinary Centre and Hospital	**02 4991 2377**
Vet Care Kurri	**02 4937 3744**
Koala Rescue (Port Stephens Koala Sanctuary)	**02 4988 0800**
Project Ecologist	**TBA**

   - Once the rescue agency arrives at the site, they are responsible for the animal. Any decisions regarding the care of the animal will be made by the rescue agency.
   - In the event the rescue service and/or local veterinary service cannot be contacted, the Site Supervisor and/or the Ecologist will deliver the injured/captured animal to the rescue agency within 24hrs.

3) For Threatened Fauna Species

- Advise the Project Manager and cease all work that may affect the threatened species.
- Notify the EESG (threatened species unit) and consult with EESG on proposed management strategies for the species. DPIE will also be notified if EPBC Act listed threatened species that were not previously identified are found.
- Do not recommence work likely to affect the threatened species until the EESG have given advice to do so.
- Relocation of fauna species of conservation significance will be undertaken by WIRES or a suitably qualified fauna specialist in consultation with EESG.
- Project Manager to record the location, number, species, relocation of the threatened species.

4) For Venomous reptiles, or raptors, other venomous animals

- Only to be handled by an appropriately trained and registered handler.
- If the animal cannot be handled (i.e., venomous reptiles), the exact location of the animal is to be recorded and provided to the appropriate rescue agency and all workers to be excluded from the vicinity.

5) Release Process

If the animal is not injured or stressed it may be released nearby, in accordance with the following:

- If the species is nocturnal, release will be carried out at dusk.
- The release area will be as close to the original habitat as possible, in an area that is not to be disturbed by the construction. Note that the open woodland habitat to be cleared in the Project Site is widespread to the north and if any fauna is captured it is to be released in this contiguous (commensurate) habitat type
- No releases are to take place during periods of heavy rainfall, unless WIRES or the ecologist determines that the species of fauna is too stressed to be held any longer
- Project Manager is to record the details of the release in a Register for relocation of native fauna. This register is also to be used for all fauna deaths and injuries on site.

Appendix D. Unexpected Finds Procedure

In the event that a threatened species or Endangered Ecological Communities not previously identified during the EIS is unexpectedly encountered during construction, the unexpected finds procedure will the followed.

D.1 Purpose

This procedure details the actions taken when any unexpected, threatened fauna or flora species is unexpectedly encountered during the construction activities.

D.2 Induction / training

Personnel involved in any aspect of activities that have a risk of discovering new threatened species, such as clearing, will be trained in the requirements of this procedure. Training will include inductions, toolbox talks, pre-starts and targeted training as required.

Photos and descriptions of threatened species occurring or likely to occur will be included in site inductions. All personnel are to be inducted on the potential threatened species occurring on site and the unexpected threatened species finds procedure.

D.3 Scope

This procedure is applicable to all activities conducted by personnel that have the potential to come into contact with threatened flora species during the project.

Where threatened fauna is unexpectedly encountered, refer to Figure D-1 of this BMP.

D.4 Procedure

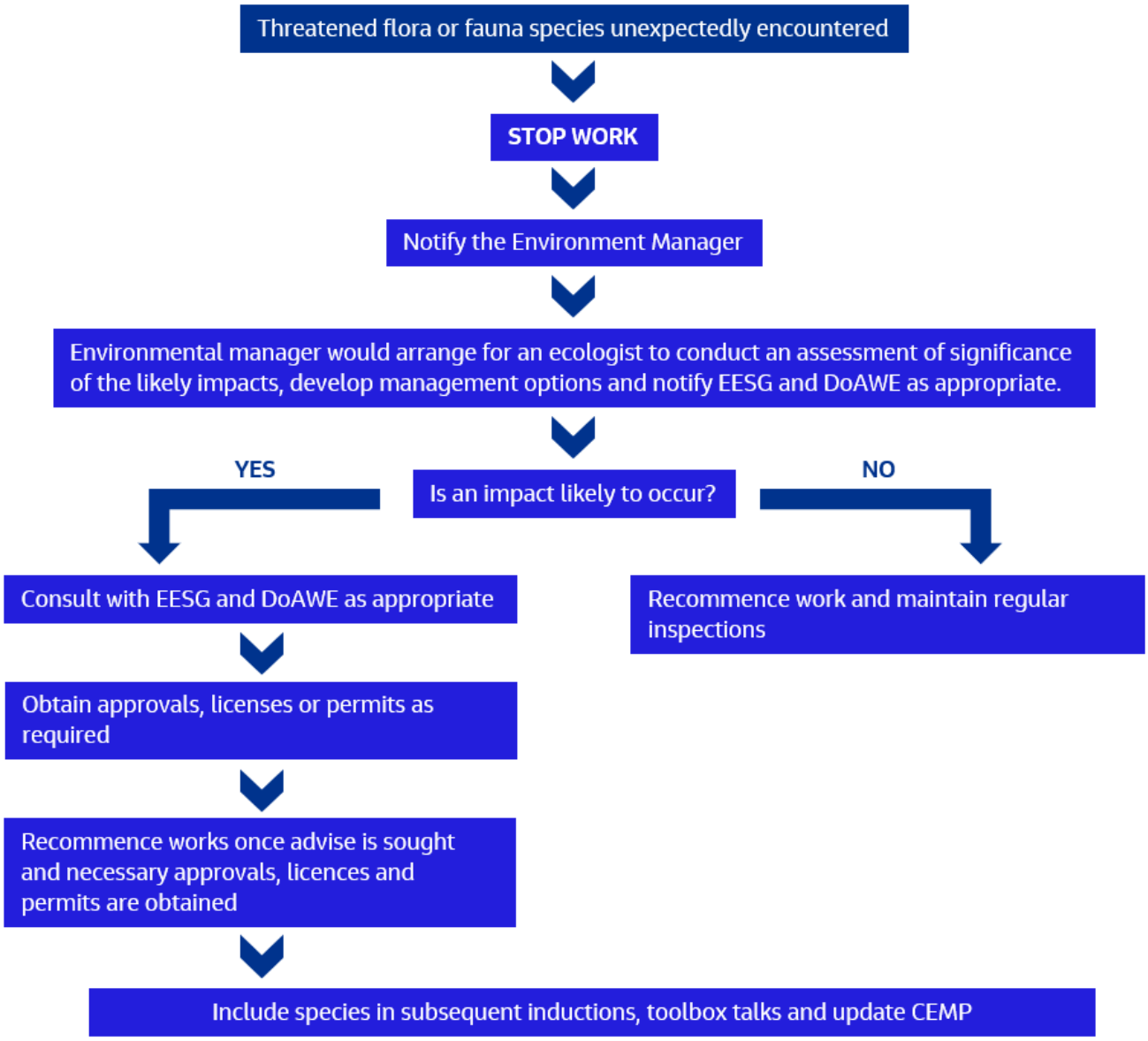

Figure D-1: Unexpected finds flowchart

Appendix E. Environmental Compliance Monitoring Checklist

The following checklist provides an example pro-forma that can be used for monitoring compliance with the procedures outlined in this BMP. Copies of the pro-forma are to be used as required for inspections by the Principal Contractor. The pro-forma provided is an example only and is to be used as a guide in the absence of the Principal Contractor's or Snowy Hydros' own environmental compliance sheets.

Completed compliance sheets are to be filed in an Environmental Log Folder. An Environmental Improvement Notice is to be completed for all Non-Conformances or rectification requirement.

Hunter Power Project Biodiversity Management Plan Compliance Monitoring Checklist					
Inspection No:			**Inspection Date:**		
Completed by:					
Item No.	**Control Measure**	**Ref. Section in plan**	**COMPLETED**		**Comments / Corrective Action for Follow-up**
			YES	**NO**	

Appendix F. Management Plan Staging

NSW GOVERNMENT | Planning, Industry & Environment

Ian Smith
Approvals Manager – Hunter Project
Snowy Hydro Limited
PO Box 332
Cooma, NSW, 2630

22/12/2021

Dear Mr. Smith

Hunter Power Project (SSI-12590060)
Management Plan Staging

I refer to the Management Plan Staging request submitted in accordance with Condition C21 of Schedule 2 of the Infrastructure Approval for the Hunter Power Project (SSI-12590060).

The Department has carefully reviewed the document and notes that Snowy Hydro propose to submit the Management Plans in two stages, construction and operation.

Accordingly, the Secretary has approved the staged submission of Management Plans for the Hunter Power Project.

Please note, a full set of revised Management Plans, consistent with relevant Conditions of Approval, must be submitted and approved prior to the commencement of Operations.

If you wish to discuss the matter further, please contact Wayne Jones on (02) 6575 3406.

Yours sincerely

Stephen O'Donoghue
Director Resource Assessments

As nominee of the Secretary