

Biodiversity Offset Package

Devil's Pulpit Pacific Highway Upgrade (EPBC 2010/5586)

Transport for NSW | April 2020







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About this release

Title	Devils Pulpit Upgrade–Biodiversity offset package
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Declaration of accuracy

In making this declaration, I am aware that section 491 of the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act) makes it an offence in certain circumstances to knowingly provide false or misleading information or documents to specified persons who are known to be performing a duty or carrying out a function under the EPBC Act or the *Environment Protection and Biodiversity Conservation Regulation 2000* (Cth). The offence is punishable on conviction by imprisonment or a fine, or both. I am authorised to bind the approval holder to this declaration and that I have no knowledge of that authorisation being revoked at the time of making this declaration.

Signed

Full name (please print)

Stuart Webster

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Transport for NSW

Date

26/05/2020

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1. Introduction

1.1 Background

The Devils Pulpit Pacific Highway upgrade project was approved by the NSW Minister for Planning on 1 February 2011. The project was approved under Part 3A of the NSW *Environmental Planning and Assessment Act 1979* (Approval 09_0179) and Part 9 of the *Environment Protection and Biodiversity Conservation (EPBC) Act 1999* (EPBC 2010/5586).

The project was jointly funded by the Australian and NSW governments. Transport for NSW (TfNSW), formerly Roads and Maritime Services engaged John Holland Pty Ltd in July 2011 to construct the upgrade.

The overall upgrade length is 7.3 kilometres (km) and includes 7.3km of new dual-lane southbound carriageway and approximately 2 kilometres of new dual-lane northbound carriageway. The old Pacific Highway was used for the remainder of the northbound carriageway. The upgrade extends from chainage 65640 to 73000. Construction started in December 2011 and the project was opened to traffic in March 2014.

1.2 Purpose of this report

The Minister's Condition of Approval (MCoA) number B5 required preparation of a Biodiversity Offset Package, whilst approval under the EPBC Act was granted subject to submission of an Offset Plan (CoA 7). Table 1.1 summarises the relevant conditions of approval and references the sections of this report where each Condition element is addressed.

Table 1.1: Minister's conditions of approval and relevant sections of report.

MCoA Element	Section of this report
Within 12 months of the approval of the Biodiversity Offset Strategy, unless otherwise agreed by the Director-General, the Proponent shall prepare and submit the Biodiversity Offset Package for the approval of the Director-General.	Report approved 17 November 2014 and this update.
The Package shall be developed in consultation with DECCW and DSEWPC and shall include, but not necessarily be limited to:	Section 1.3 and Appendix A
a) the final suite of the biodiversity offset measures selected in accordance with the Biodiversity Offset Strategy;	Section 4.2
b) the management and monitoring requirements for compensatory habitat works and other ecological amelioration measures proposed under the Package to ensure the outcomes of the Strategy are achieved; and	Section 4.5, 4.6 & 4.7
c) timing and responsibilities for the implementation of the provisions of the Package over time.	Section 4.8
The requirements of the Package shall be implemented by the responsible parties according to the timeframes set out in the package.	Section 4.8

EPBC Act Element	Section of this report
The person taking the action must submit an Offset Plan for approval by the Minister within 12 months of the date of this approval to provide for the conservation and management in perpetuity of a minimum of 152 hectares of habitat for the Grey-headed Flying-fox, the Spotted-tail Quoll, the Regent Honeyeater and the Swift Parrot. The approved plan must be implemented. The Offset Plan must include, but not be limited to:	Report submitted 17 October 2014, December 2017, November 2019 and this update.
a. The acquisition and conservation of land containing a minimum of 152 hectares of habitat for the Grey-headed Flying-fox, the Spotted-tail Quoll, the Regent Honeyeater and the Swift Parrot that is of equal or greater quality to that to be removed for the Pacific highway upgrade;	Section 4.2
b. The land referred to at condition 7(a) must be located within 50km of the Pacific Highway upgrade at Devils' Pulpit, unless otherwise agreed to by the department;	Section 4.2 & Figure 4.1
c. The land referred to at condition 7(a) must be protected by a legal instrument under relevant nature conservation legislation on the title of the area within 18 months of the date of this approval.	Section 4.4
d. The instrument referred to in Condition 7(c) must provide for: i. The protection of the land in perpetuity ii. Prevent any future development activities iii. Ensure the active management of the land;	Section 4.4
i. The land referred to at condition 7(a) must provide linkages to existing habitat for the species of concern.	Section 4.2 & Figure 4.1
e. The Offset Plan must include a clear commitment to ongoing management of the land at Condition 7(a). Management works must be consistent with advice from a suitably qualified expert. These measures must commence within 3 months of the legal protection of the land.	Section 4.5
f. The Plan must include key milestones, performance indicators, corrective actions and timeframes for the completion of all actions outlined in the Plan.	Section 4.6
g. The Plan must include clear outline of funding for the management in perpetuity of the land at Condition 7(a).	Section 4.4
h. The Plan must be developed in consultation with the department.	Section 1.3 & Appendix A

The Devils Pulpit upgrade Biodiversity Offset Strategy (Hyder, 2012a) was approved in February 2012 and the Offset Package was required within 12 months of this date, or February 2013. TfNSW was granted an extension until December 2013 to allow for consultation with the Office of Environment and Heritage (OEH)/Environmental Protection Agency (EPA) and the National Parks and Wildlife Service (NPWS), and property negotiations regarding acquisition of land. TfNSW received a further extension until 30 September 2014 to allow sufficient time for negotiation and transfer of the offset property to the NPWS.

The purpose of this report is to address the requirements of MCoA B5 and CoA 7 and detail the biodiversity offset and mitigation completed on the project.

1.3 Consultation

The details within this plan have been completed through ongoing consultation with the OEH/EPA and NPWS and the Department of Agriculture, Water and the Environment (DAWE), formerly the Department of the Environment. The NPWS agreed to add the offset property to the National Parks Estate on 13 September 2013. Subsequently there has been ongoing negotiation regarding property transfer, ongoing management actions and funding. DAWE was consulted during the offset property assessment phase and confirmed on 5 September 2013 that the entire property will be acceptable as an offset for the project.

The Offset Package was submitted to the Department of Planning and Environment for approval and subsequently approved by the Secretary on 17 November 2014.

The Offset Package was submitted to the Department of Agriculture, Water and the Environment for approval on 17 October 2014. Following an audit of the Devils Pulpit Upgrade by DAWE that was undertaken between March and August 2017, DAWE contacted TfNSW and requested that the Offset Package be resent to the Department for approval. A revised Offset Package was submitted for approval in December 2017 and again in November 2019. This Offset Package has been revised as a result of comments received from DAWE in October 2018 and February 2020. Further detail on consultation undertaken with stakeholders is included at Appendix A.

2. Project Impacts

The Biodiversity Offset Strategy (Appendix B) detailed the vegetation types that were expected to be impacted by the Upgrade (Table 2.1). As detailed in the Strategy, Endangered Ecological Communities (EEC) impacted by the project are offset at a ratio of 4:1, with non-EEC impacted offset at a ratio of 2:1.

Table 2.1: Vegetation types predicted to be impacted in the Biodiversity Offset Strategy and the final 'as built' impacts on native vegetation types, with the approved offset requirement.

Biometric Vegetation Type	BoS impact—direct and indirect (ha)	As built impact – direct and indirect (ha)	Offset ratio	BoS Offset requirement (ha)
Blackbutt-Spotted Gum shrubby open forest on sandstones of the lower Clarence Valley of the North Coast	35.35	28.72	2:1	105.84
Scribbly Gum-Red Bloodwood heathy open forest of the coastal lowlands of the North Coast	13.2	10.7		
Spotted Gum-Grey Ironbark-Pink Bloodwood open forest of the Clarence Valley lowlands	4.37	2.94		

of the North Coast				
Narrow-leaved Red Gum woodlands of the lowlands of the North Coast (EEC)	10.39	10.17	4:1	71.52
Narrow-leaved Red Gum woodlands of the lowlands of the North Coast – modified (EEC)	4.64	4.5		
Forest Red Gum-Swamp Box of the Clarence Valley lowlands of the North Coast (EEC)	2.85	2.72		
TOTAL	70.8	59.75		177.36

Despite the reduced clearing impact, TfNSW will offset the entire 70.8 ha clearing impact identified in the offset strategy. This will account for the majority of tie-in works associated with the Woolgoolga to Ballina upgrade project. Any additional impact areas will be offset under the Woolgoolga to Ballina Biodiversity Offset Package.

3. Management of Biodiversity Impacts

3.1 Biodiversity Mitigation Measures

Biodiversity offset and mitigation measures are outlined in the Biodiversity Offset Strategy and follow the Avoid, Minimise, Mitigate and Offset approach. The key biodiversity mitigation measures for the Devils Pulpit upgrade include:

- Fauna Crossing Measures;
- Revegetation Measures;
- Salvage Translocation Plan;
- Other Fauna Mitigation Measures; and
- Biodiversity Monitoring Measures.

3.2 Fauna Crossing Measures

Fauna crossing structures have been designed and located to coincide with identified fauna corridors (Table 3.1). All underpasses listed in the table are combined drainage and fauna passages. An additional eight incidental structures have also been constructed (see Hyder 2012a). Table 3.1 identifies the structure type, its location within the upgrade, current status and relationship with the northbound and southbound carriageways.

Table 3.1: Combined Fauna Crossing Structures: Devils Pulpit Project. RCBC = Reinforced Concrete Box Culvert

Approximate Chainage	Type of facility	Current Status	Carriageway
66270	3 x 2400mm x 900mm RCBC	complete	Both carriageways
67170	1 x 2100mm x 2100mm RCBC	complete	NB carriageway
67185	2 x 2400mm x 1500mm RCBC	complete	SB carriageway
67250	2 x 2400mm x 2400mm RCBC	complete	SB carriageway
68500	Aerial rope bridge	complete	Both carriageways

69025	2 x 2400mm x 1500mm RCBC	complete	Both carriageways
69100	2 x 2400mm x 2400mm RCBC	complete	Both carriageways
71480	Large bridge over Tabbimoble Floodway No. 3	complete	Both carriageways
71900	Large bridge over Tabbimoble Floodway No. 2	complete	Both carriageways

Floppy-top fauna (exclusion) fence was installed 200m either side of four underpasses (Table 3.2). Frog fence was integrated into the design of floppy-top fencing and extended for 100m either side of the underpasses listed in Table 2.2. Two vegetated medians have been retained between chainages 66300-67800 and 69300-70700 to provide crossing opportunities for squirrel and yellow-bellied gliders. In addition, a rope bridge has been installed at Chainage 68500 to provide a linkage between Devils Pulpit State Forest and Bundjalung National Park. Monitoring of the rope bridge commenced in August 2013. All waterway crossings were designed to minimise impacts on fish passage.

Table 3.2: Location of floppy-top fauna (exclusion) fence.

Chainage	Comment
67170	Associated with combined fauna structures at Ch67170 (northbound carriageway) and Ch67185 and 67250 (southbound carriageway) with combined fencing between carriageways to funnel fauna.
69060	Associated with combined fauna structure at Ch69100 with combined fencing between culverts to funnel movement.
71480	Tabbimoble floodway No. 3 with combined fencing between carriageways to funnel movement.
71900	Tabbimoble floodway No. 2 with fencing between carriageways to funnel movement.

3.3 Revegetation Measures

Re-vegetation and rehabilitation of disturbed areas within the project boundary occurred progressively during the construction phase to reduce erosion risk, manage water quality impacts and improve habitat connectivity. Revegetation measures included:

- Establishing a fauna movement corridor within a 60m wide strip of degraded Sub-tropical Coastal Floodplain Forest near the Tabbimoble No 2 and No 3 bridges, between chainages 70200 and 71900.
- Planting a range of locally occurring native shrubs, trees and ground covers endemic to Dry Sclerophyll Forest and Sub-tropical Floodplain Forest communities impacted by the upgrade.
- Restoring and rehabilitating riparian vegetation in and around watercourses affected by the upgrade.
- Targeted planting of key food plants, including: *Allocasuarina* spp. for Glossy Black Cockatoo, *Eucalyptus propinqua* for Koala, *Corymbia* and *Angophora* spp. for Little Lorikeet, gliders and Grey-headed Flying-fox and *E. tereticornis* and *E. siderophloia* for Black-chinned Honeyeaters.
- Providing fringing vegetation around water bodies to enhance habitat for

- amphibians, including Green-thighed Frogs and Wallum Froglets.
- Hydromulching all areas of exposed soil using a seed mix of locally endemic species.
- Replacing topsoil that was removed and stockpiled from areas formerly containing the Eastern Red Gum Floodplain forest community.
- Controlling weeds in regeneration areas for one year after construction was completed.

TfNSW sought an amendment, from the Department of Planning and Infrastructure (DP&I), to the approved rehabilitation plan to delay rehabilitation of the Devils Pulpit site compound. The proposed delay in rehabilitation would enable the site to be used as an ancillary construction facility for the proposed Woolgoolga to Ballina Upgrade. On 2 December 2014 the Secretary approved the transfer of the Devils Pulpit site compound to the Woolgoolga to Ballina upgrade approval.

3.4 Salvage Translocation Plan

The Biodiversity Offset Strategy found that no threatened flora species were likely to be affected by the upgrade and that flora translocation was unnecessary (Hyder, 2010 & 2012a). Pre-clearing surveys targeting threatened flora were undertaken in the clearing footprint prior to commencement of clearing (Geolink, 2012). A small number of Koala Bells (*Artanema fimbriatum*), a regionally significant plant species, were translocated from the impact area in March 2012. Monitoring results indicate that translocation was successful (John Holland, 2013).

There was a low risk of impact to *Cyperus aquatilis* with one known record of this species on the upstream side of Tabbimoble Floodway No 2. To ensure impacts were avoided temporary fencing was installed to restrict access to that area.

3.5 Other Fauna Mitigation Measures

Additional commitments identified in the Biodiversity Offset Strategy and completed during the construction phase included:

- Preclearing surveys to identify and mark hollow-bearing trees, sap feed trees, nests and possum dreys, rock outcrops and boulders, burrows, koala habitat areas, aquatic habitats, significant hollow logs.
- Implementing a two-stage clearing protocol which involved:
 - Initial removal of all non-habitat trees (i.e. trees that do not contain hollows, nests, dreys or other important habitat features).
 - 48 hours after initial clearing controlled felling of habitat trees under supervision of an ecologist and inspection of trees to capture and relocate fauna into adjacent forest.
 - Relocation of hollow logs and limbs into adjoining habitat.
- Targeted survey for Green-thighed Frog at the unnamed drainage (Chainage 69000).

3.6 Biodiversity Monitoring Measures

To satisfy MCoA B6 an Ecological Monitoring Program (EMP) was prepared in consultation with the OEH/EPA (Hyder, 2012b). The broad objective of the EMP was to monitor the effectiveness of mitigation measures identified in the biodiversity offsets strategy for threatened species directly impacted by the project. The effectiveness of mitigation measures have/will be assessed by:

- Monitoring construction related impacts during construction;

- Monitoring threatened species adjacent to the project footprint;
- Identifying changes to habitat usage and assess whether changes can be attributed to the project.

The agreed scope of the monitoring program was to:

- Develop monitoring methodology for threatened species occurring adjacent to the project footprint. Target species include Oxleyan Pygmy Perch, Rufous Bettong, Spotted-tail Quoll, Green-thighed Frog, Yellow-bellied Glider, Squirrel Glider, Brush-tailed Phascogale and Koala;
- Develop an adaptive monitoring program to assess the effectiveness of the mitigation measures identified in condition B3 and B4(C) and allow their modification if necessary. Target measures to be monitored include: fauna underpasses, rope bridge, fauna fencing, vegetated median and restoration of vegetated connectivity corridor.
- Monitoring shall be undertaken during construction (for construction-related impacts) and from opening of the project to traffic until such time as the effectiveness of mitigation measures can be demonstrated to have been achieved over a minimum of three consecutive monitoring periods;
- Provision for the assessment of the data to identify changes to habitat usage and if this can be attributed to the project;
- Details of contingency measures that would be implemented in the event of changes to habitat usage patterns directly attributable to the construction or operation of the project; and
- Provision for annual reporting of monitoring results to the Director General, the DECCW (now OEH) and SEWPac (now DAWE), or as otherwise agreed by those agencies.

The EMP provides details on the timing of monitoring, monitoring procedure and potential indicators of success. Monitoring during construction is reported in the various compliance reports. Monitoring of the rope bridge commenced in August 2013 and monitoring of selected underpasses and threatened fauna populations commenced in year 3, and will continue in years 4 and 6 post-construction. Results of operational monitoring of Spotted-tail Quoll and Oxleyan Pygmy Perch have been reported in the annual compliance reports and are available on the TfNSW website.

4. Biodiversity Offsets

4.1 Options for Biodiversity Offsets

The approved Biodiversity Offset Strategy (Hyder, 2012a) proposed three options for consideration:

- Option A** Secure additional native vegetation protected through an appropriate legal instrument that ensures the land is managed for conservation.
- Option B** Additional revegetation in strategic locations that have the potential to complement existing regional natural resource management activities. Under this secondary option, similar vegetation communities of similar conservation status to those impacted by the project would be targeted.
- Option C** Investment in management research related to the rehabilitation and protection of relevant threatened species, such as the Yellow-bellied Glider, Squirrel Glider and/or Oxleyan Pygmy Perch.

TfNSW has secured lands to meet Option A of the Strategy. Section 4.2 details how these lands meet the objectives outlined in the Strategy.

4.2 Summary of proposed offset measures

TfNSW proposes to offset biodiversity impacts associated with the Devils Pulpit upgrade through transferring to the National Park Estate a property at 1457 Myall Creek Road, Bungawalbin (Figure 4.1). The property consists of Lot 21 DP755601 and Lot 2 DP 1112483, which collectively cover 386 ha of lowland floodplain forest.

The subject property compares favourably to the selection criteria for offset lands as detailed in the Devils Pulpit upgrade Biodiversity Offset Strategy. The Biodiversity Assessment for this property, prepared by Benchmark Environmental Management (2013), and supplementary assessment prepared by Sandpiper Ecological Surveys (2013a & b) are detailed in Appendix C and Appendix D respectively. Key features of the offset property include:

- Situated within 50 km of the upgrade project;
- Situated within the Bungawalbin Creek catchment, an area known for its biodiversity;
- Contains a diverse range of habitat types that provide suitable habitat resources for 34 threatened fauna species, 30 threatened flora species and nine migratory species;
- Contains important habitat resources including a number of seasonal drainage lines and permanent lagoons, old growth riparian forest along Physics and Bungawalbin Creeks, a moderate number of hollow bearing trees with a range of arboreal hollow sizes, a variety of ground vegetation including grassland and sedgeland and a reliable blossom resource including winter flowering eucalypts;
- The subject land contains five vegetation types (Table 4.1 and Figure 4.2) that cover a total of 386 ha, three of which are Endangered Ecological Communities that cover a total of 271 hectares;
- All vegetation communities, except the small area of cleared land, had low weed infestation and were in moderate to good condition;
- The property provides a vegetative connection between the riparian corridor of Bungawalbin Creek and Bungawalbin Nature Reserve, an abundant seasonal blossom resource (forest red gum, grey ironbark, flooded gum, and paperbark) and is located within an extensive area of contiguous floodplain forest linked to coastal escarpment forest in the Richmond Range.

The disused mill was removed from the site in May 2016 and the site was rehabilitated.

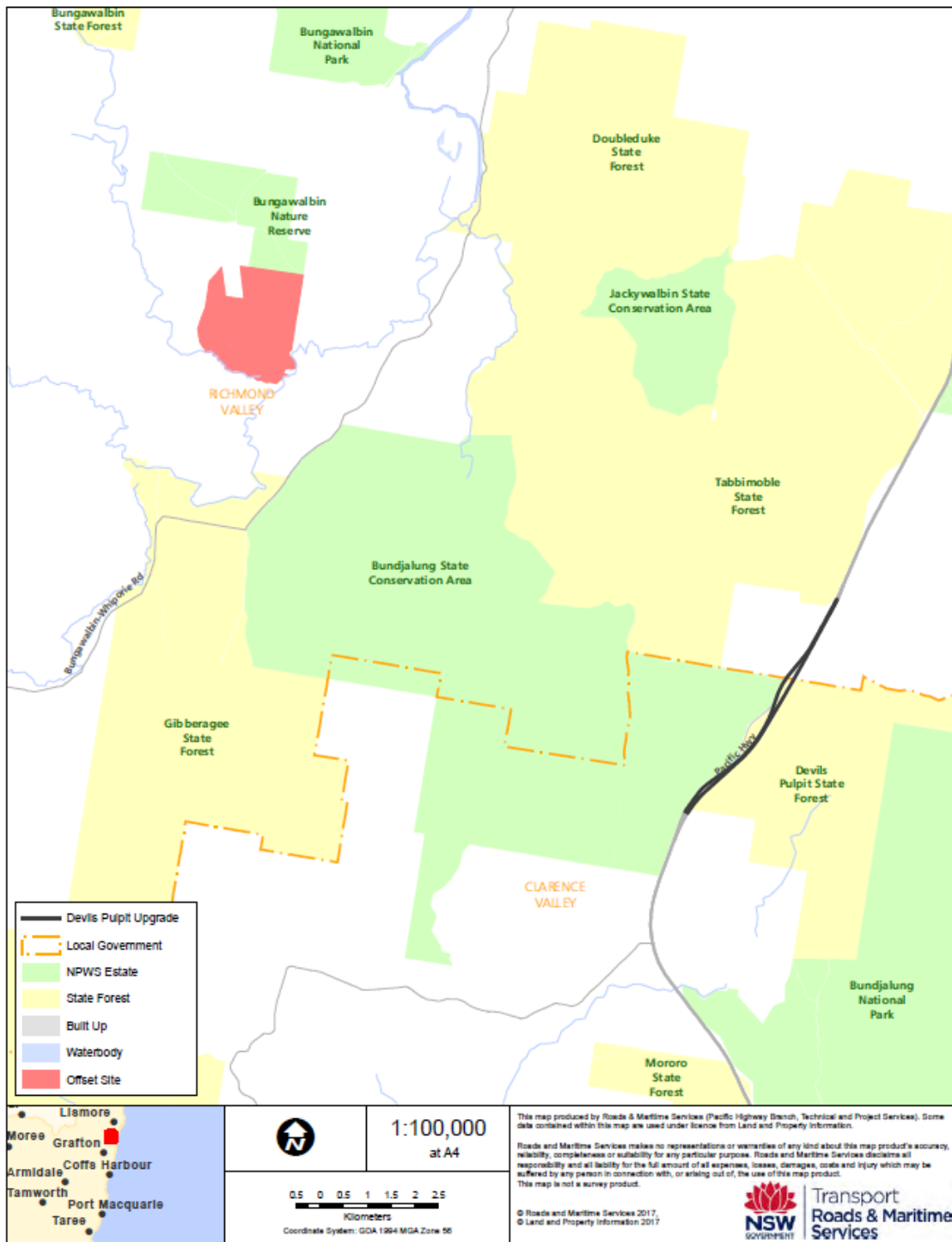


Figure 4.1: Location of the offset site in relation to the Devils Pulpit Upgrade

Table 4.1: Biometric vegetation types identified on the Bungawalbin offset site (Benchmark Environmental Management, 2013).

Keith (2004) Formation-Vegetation Class	Biometric Vegetation Type	Offset Area (ha)	EEC
Forested Wetlands – Coastal Floodplain Wetlands	Forest Red Gum-Swamp Box of the Clarence Valley Lowlands of the North Coast	249.11	Yes
	Narrow-leaved Red Gum Woodlands of the Lowlands of the North Coast		Yes
Forested Wetlands – Coastal Swamp Forests	Paperbark Swamp Forest of the Coastal Lowlands of the North Coast	22.21	Yes
Dry Sclerophyll Forests – Clarence Dry Sclerophyll Forest	Grey Gum-Grey Ironbark Open Forest of the Clarence Lowlands of the North Coast	92.35	No
North Coast Wet Sclerophyll Forests	Flooded Gum-Tallowood-Brush Box Moist Open Forest of the Coastal Ranges of the North Coast	22.61	No
TOTAL		386.28	

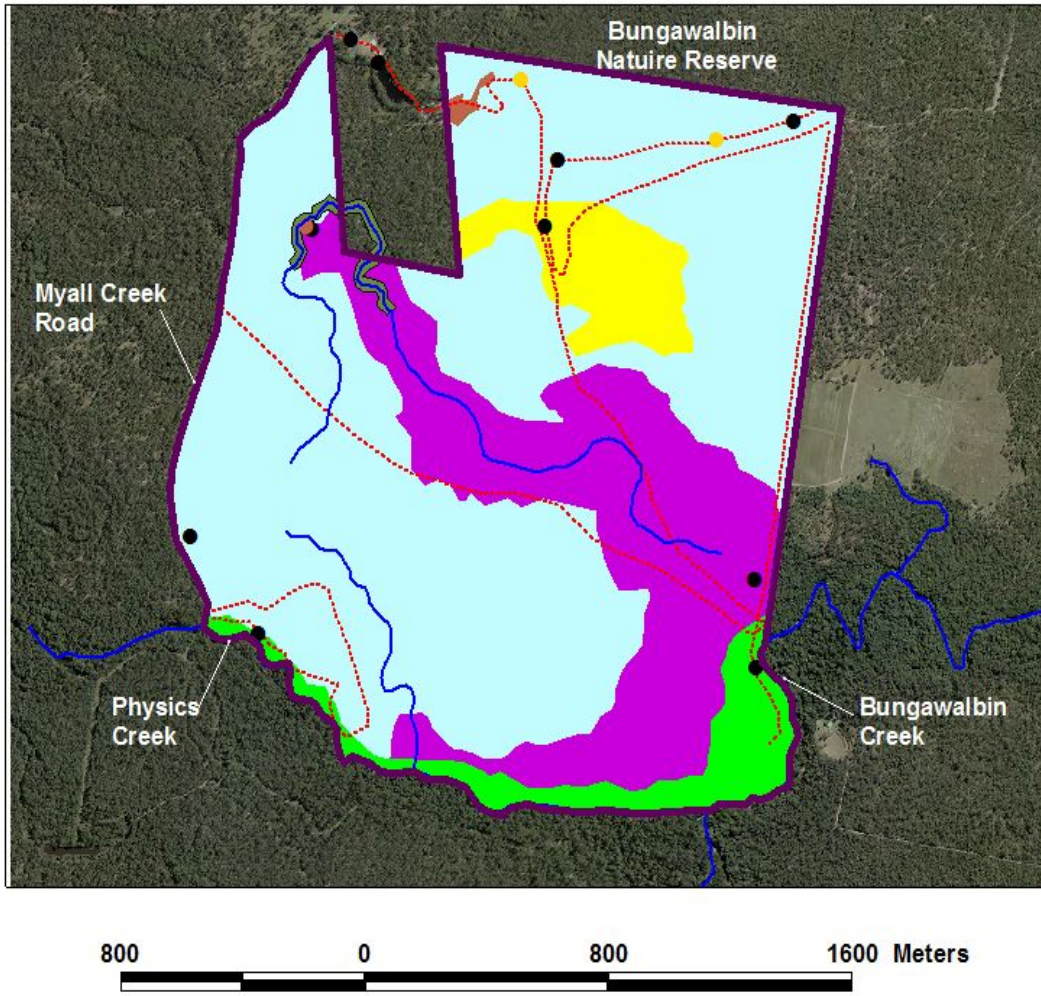


Figure 4.2: Distribution and extent of vegetation types at 1457 Myall Creek Road.

Table 4.2: State listed threatened species predicted to be impacted by the project (Hyder, 2012a) and known or potential habitat on the Bungawalbin offset property (BEM, 2013 unless otherwise stated).

Threatened species predicted to be impacted	Known or potential habitat on offset site
Recorded during project surveys	
Brown Treecreeper (<i>Climacteris picumnus victoriae</i>)	Associated with all vegetation classes found on site (OEH TSBPS ¹).
Glossy Black-Cockatoo (<i>Calyptorhynchus lathami</i>)	Foraging.
Barking Owl (<i>Ninox connivens</i>)	Roosting, foraging, breeding.
Masked Owl (<i>Tyto novaehollandiae</i>)	
Powerful Owl (<i>Ninox strenua</i>)	
Little Lorikeet (<i>Glossopsitta pusilla</i>)	Roosting, foraging, breeding.
Black-chinned Honeyeater (<i>Melithreptus gularis</i>)	Roosting, foraging.
Squirrel Glider (<i>Petaurus norfolcensis</i>)	Shelter, foraging, breeding.
Yellow-bellied Glider (<i>Petaurus australis</i>)	Shelter, foraging, breeding.
Greater Broad-nosed Bat (<i>Scoteanax rueppellii</i>)	Roosting, foraging.
Yellow-bellied Sheath-tail Bat (<i>Saccolaimus flaviventris</i>)	Roosting, foraging.
Hoary Wattled Bat (<i>Shalinolobus nigrogriseus</i>)	Associated with all vegetation classes found on site (OEH TSBPS).
Eastern False Pipistrelle (<i>Falsistrellus tasmaniensis</i>)	Associated with all vegetation classes found on site (OEH TSBPS).
Grey-headed Flying Fox (<i>Pteropus poliocephalus</i>)	Roosting, foraging.
Southern Myotis (<i>Myotis macropus</i>)	Roosting, foraging, breeding
Little Bentwing-bat (<i>Miniopterus australis</i>)	Roosting, foraging, breeding
Eastern Bentwing-bat (<i>Miniopterus schreibersii</i>)	Foraging.
Eastern Cave Bat (<i>Vespadelus troughtoni</i>)	Associated with 3 of the vegetation classes found on site (OEH TSBPS).
Potential habitat identified during project surveys	
Grey-crowned Babbler (<i>Pomatostomus temporalis temporalis</i>)	Known – roosting, foraging, breeding
Koala (<i>Phascolarctos cinereus</i>)	Potential – shelter, foraging, breeding.
Spotted-tail Quoll (<i>Dasyurus maculatus</i>)	Potential – shelter, foraging, breeding.
Eastern Freetail Bat (<i>Mormopterus norfolkensis</i>)	Potential (OEH TSBPS). Linked with all vegetation classes found on site.
Green-thighed Frog (<i>Litoria brevipalmata</i>)	Potential – shelter, foraging, breeding.
Wallum Froglet (<i>Crinia tinnula</i>)	
Brush-tailed Phascogale (<i>Phascogale tapoatafa</i>)	Potential – shelter, foraging, breeding.

Rufos Bettong (<i>Aepyprymnus ru fescens</i>)	Potential – shelter, foraging, breeding.
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¹Office of Environment and Heritage Threatened Species Biodiversity Profile Search.

Offset Summary

The Biodiversity Offset Strategy proposed a variable offset ratio of:

- Endangered Ecological Communities (EEC) and poorly conserved vegetation communities impacted by the project would be offset at a ratio of **4:1**; and
- Non-EEC vegetation communities impacted by the project would be offset at a ratio of **2:1**.

The combined (overall) offset ratio proposed in the Biodiversity Offset Strategy was 3.2:1. The final offset ratio delivered is 5.5:1, due to the size of the proposed offset property. Information presented in the Strategy was based on principles developed by the Office of Environment and Heritage (OEH). Subsequent to approval of the Strategy the DAWE (formerly SEWPaC) released an Offsets Assessment Policy with accompanying Offsets Assessment Guide and offsets assessment calculator (SEWPaC 2012).

The policy and guide provide a decision support framework in order to normalise the judgments associated with determination of proposed offsets for a given impact. The approach is superior to previously used offset ratios as it considers the ecological value of offset properties in a standardised and equitable manner. In this case the offsets calculator was used to determine the suitability of the Myall Creek Road property as an offset for impacts on Spotted-tailed Quoll, Grey-headed Flying-fox, Regent Honeyeater and Swift Parrot. According to the offsets policy a property must directly offset 100% of the impact of an activity (SEWPaC 2012). Whilst a minimum direct offset of 90% is acceptable the remaining 10% must be made up of other compensatory measures, such as education or research projects. The “Area of Habitat” component of the impact calculator was used to assess the suitability of the Myall Creek Road property as an offset (Sandpiper Ecological Surveys 2013a).

Conditions of approval relating to offset requirements are detailed in the Biodiversity Offsets Strategy (Hyder 2012a). In summary the major components are:

- MCoA B4 required the offset of 80 ha of Dry Sclerophyll Forest and 72 ha of Sub-tropical Coastal Floodplain Forest.
- The *EPBC Act* Conditions of Approval required:
 - The acquisition and conservation of 152 ha of habitat for Grey-headed Flying Fox, Spotted-tailed Quoll, Regent Honeyeater and Swift Parrot that is of equal or greater quality to that removed;
 - Habitat must be within 50 km of the Devils Pulpit Upgrade;
 - The land must be protected by a legal instrument under relevant nature conservation legislation on the title of the land within 18 months of this approval;
 - The instrument referred to (above) must provide for; protection of the land in perpetuity, prevent any future development activities, ensure the active management of the land; and
 - The land must provide linkages to existing habitat for the species of concern.

The total area proposed for offset is 386.28 ha (Table 4.1). This includes 92 ha of Dry Sclerophyll Forest and 249 ha of vegetation equivalent to Sub-tropical Coastal

Floodplain Forest, which satisfies MCoA B4. The suitability of the Myall Creek Road property as an offset was assessed using the offset calculator (see Sandpiper Ecological Surveys 2013a & b) (Appendix D). The final assessment concluded that the “% of impact offset” was:

- 103% for spotted-tailed quoll;
- 241% for Grey-headed Flying-Fox;
- 183% for Regent Honeyeater; and
- 181% for Swift Parrot.

To be considered suitable, habitat quality at the offset site must be equal to or better than the habitat impacted (SEWPaC 2012). The offset property had higher quality habitat than the impact site for all species except Spotted-tailed Quoll. Habitat at the offset site scored lower than the impact site (for quolls) due to forest age and the absence of abundant arboreal hollows and large logs. DAWE advised they are willing to forgo the quality of habitat requirement given the quality and extent of the proposed site and as the project approval predated the *EPBC Act Offsets Policy* (Appendix A).

EPBC Act conditions of approval satisfied by the offset property include:

1. Conserves over 152 ha of habitat for Spotted-tailed Quoll, Grey-headed Flying fox, Swift Parrot and Regent Honeyeater.
2. Site located within 50 km of the Devils Pulpit Upgrade.
3. The land will be protected under the *National Parks and Wildlife Act 1974*.
4. The land will be protected in perpetuity, be free from development and actively managed for conservation.
5. The land provides a direct linkage between riparian corridors and Bungawalbin Nature Reserve.

4.3 Future Offset Value

The offset property includes a substantial area of creek line and riparian forest that is known Giant Barred Frog (*Mixophyes iteratus*) habitat (see Lewis & Rohweder 2005; SES unpub data). The extent of Giant Barred Frog habitat is broadly analogous to the Flooded Gum/Tallowood/Brush Box Moist Open Forest shown on Figure 4.2. That community covers an area of 22.6 ha and extends along the edge of Physics and Bungawalbin Creeks. The broader extent in the southeast corner is associated with a series of seasonal creek channels and swales that are linked to Bungawalbin Creek during floods.

Bungawalbin and Physics Creeks contain high quality habitat that is characterised by slow stream flow with regular pool/riffle intervals, sandy banks and bars, steep banks with undercuts, abundant woody debris and good ground cover. The riparian zone is dominated by mature *Syzygium floribundum* that provides a dense litter layer. The riparian zone has experienced limited disturbance from fire, logging and cattle. The confluence of Bungawalbin and Physics Creeks is a complex system with multiple floodways and swales extending on either side of the main channel.

Giant Barred Frog is not required to be offset under this offset package. In line with advice received from the DAWE on 19 February 2014 (Appendix A), the Giant Barred Frog habitat area on this site could be used to offset another project providing additional management measures, above and beyond that required as part of the Devil’s Pulpit approval which provide an additional conservation gain for the relevant species are implemented. TfNSW intends to include 22.6 ha of this property to assist in offsetting the impacts to the Giant Barred Frog from the Woolgoolga to Ballina

Pacific Highway Upgrade and will provide details of the additional management actions and conservation gains achieved for this species in the Biodiversity Offset Package that will be developed for that project.

Table 4.3: Comparison of equivalent vegetation types available as compensatory habitat on the subject land.

Affected Vegetation Communities	Area Impacted by the Upgrade Project (ha)	Equivalent Vegetation Types on the Subject Land	Available Offset Area (ha)
Blackbutt - Spotted Gum shrubby open forest on sandstones of the lower Clarence Valley of the North Coast	52.92	Grey Gum-Grey Ironbark Open Forest of the Clarence Lowlands of the North Coast	92.35
Scribbly Gum - Red Bloodwood heathy open forest of the coastal lowlands of the North Coast			
Spotted Gum - Grey Ironbark - Pink Bloodwood open forest of the Clarence Valley lowlands of the North Coast			
Narrow-leaved Red Gum woodlands of the lowlands of the North Coast	17.88	Narrow-leaved Red Gum woodlands of the lowlands of the North Coast	249.11
Forest Red Gum - Swamp Box of the Clarence Valley lowlands of the North Coast		Forest Red Gum - Swamp Box of the Clarence Valley lowlands of the North Coast	

Comparison with Biodiversity Offsets Strategy Objectives

A summary of how the offset property satisfies the objectives of the Biodiversity Offset Strategy is provided in Table 4.4.

Table 4.4: Compliance of the offset property with the Biodiversity Offset Strategy objectives.

Objective	Comment
Maintains or improves biodiversity values	Offset property is situated in an area renowned for its biodiversity and links riparian corridor to conservation reserves.
Secure the long-term protection and management of land containing EEC and habitat for threatened species	The offset property contains 271ha of EEC and an equivalent area of suitable habitat for a number of threatened species, including those affected by the upgrade.
Meet the minimum requirements for offsets as specified in the NSW & Commonwealth CoA.	The offset property exceeds the area of offset stipulated in both the state and commonwealth conditions and exceeds the 100% threshold of Commonwealth Biodiversity Offsets Policy.
The total area of land offset exceeds the direct and indirect (edge effects) impacts of the project.	The area of land offset is more than 5 times greater than the direct and indirect impacts of the project.
The process for setting the scope and quantum of the biodiversity offsets is transparent and justifiable on environmental, social & economic grounds.	The offset assessment process has been fully transparent. Ongoing consultation has been undertaken with State and Commonwealth departments during the assessment phase and post approval.

4.4 Protection mechanism

The Myall Creek Road property will be transferred to the National Parks & Wildlife Service (NPWS) to maintain and manage in perpetuity. TfNSW currently owns the Myall Creek Road property and has agreed to transfer the property to NPWS who would undertake the long-term management and conservation of the property. TfNSW will transfer ownership of the property to NPWS to be included initially in the Bungawalbin State Conservation Area. NPWS will continue to request the property be incorporated into the Bungawalbin Nature Reserve as part of a routine five-year statutory review of all State Conservation Areas (Appendix A).

TfNSW has conducted a MinView search of the property and at the time of submission of this package can confirm that there is no current mining or exploration leases or applications over the property (Appendix A).

The offset site will be managed as native vegetation for biodiversity conservation. To ensure in-perpetuity funding will be available to manage the site, TfNSW has agreed to provide funding (based on that provided for a Biodiversity Stewardship Agreement (BSA), created under the *Biodiversity Conservation Act 2016*, to NPWS. The property will be managed under the existing NPWS Plan of Management for the Bungawalbin and Yarrungully Parks and Reserves (NPWS, 2012) (Appendix E). The broad

management strategies for the site are outlined in Section 4.5 and planned monitoring in Section 4.7 of this offset package. The agreed payment to NPWS has been calculated to provide for ongoing management of the property. The funding provided will be used to implement the on-ground works required by each of the management strategies. This includes funds sufficient to undertake the fencing, track maintenance, weed control, pest control and ecological fire management that is required on this property.

4.5 Offset area management framework

Within three months of the property being gazetted as a SCA, the management framework for the offset site will be incorporated into the Plan of Management Bungawalbin and Yarringully Parks and Reserves (NSW NPWS, 2012) and required management actions will be commenced. Additional management actions for species that will be offset by other projects, for example, Giant Barred Frog, will also be incorporated into this management plan. A copy of the revised Plan of Management will be provided to DP&E and DAWE when finalised.

Sandpiper Ecological Surveys endorsed the recommended management framework detailed in Table 4.5.

Table 4.5: Offset area management framework to be incorporated into the current Plan of Management within three months of the property being gazetted as a SCA.

Objective	Strategy	Measures of success	Timeframe
<p>Achieve an appropriate conservation agreement and land zonings for the site</p> <p>Protection and conservation of key biodiversity values of the site under a conservation agreement including those values that require protection in perpetuity.</p>	Formalise protection of property for conservation of biodiversity values in perpetuity	Property protected as a State Conservation Area.	Upon transfer of the property to NPWS.
<p>Management of impacts from adjacent land uses</p>	Ensure that management of residual lands are consistent with the objectives of the biodiversity offset areas	Adequate fencing of the proposed offset area maintained in perpetuity to exclude livestock entering the site from adjoining landholdings including private property.	Commence within 3 months of gazettal, on-going.

Objective	Strategy	Measures of success	Timeframe
		Establishment of access trails to provide access to management vehicles.	
Manage pest animals	Comply with the Pest Management Strategy for the planning area.	Implementation of pest animal management actions for the offset area. Reduction in evidence of pest animal species (refer to Section 4.6).	Commence within 3 months of gazettal, ongoing.
Manage weed species	Comply with the Pest Management Strategy for the planning area.	Implementation of weed management actions for the offset area. Reduction of cover of exotic species and weeds reduced to a maintenance level of control in perpetuity (refer to Section 4.6).	Commence within 3 months of gazettal, ongoing.
Fire management	Comply with the Fire Management Strategy for the planning area.	Implementation of fire management actions for the offset area including biodiversity management.	Commence within 3 months of gazettal, ongoing.

4.6 Specific milestones for MNES impacted

The following table shows the specific milestones, performance indicators, corrective actions and completion timeframes for each of the MNES impacted, based on advice received from Sandpiper Ecological Surveys. These are consistent with the desired outcomes and management responses included in the NPWS Plan of Management Bungawalbin and Yarrungully Parks and Reserves (NSW NPWS, 2012).

Table 4.6: Specific milestones, performance indicators, corrective actions and completion timeframes for MNES impacted by the project.

MNES impacted	Specific milestones	Performance indicators	Corrective actions	Completion timeframes
Spotted-tailed quoll	Native vegetation is maintained or improved from current state.	Annual vegetation and habitat monitoring identifies no improvement, or a decline in (vegetation/habitat) condition, from baseline state.	<ul style="list-style-type: none"> • Additional remedial actions to restrict vehicle access if any illegal clearing detected. • Restriction of vegetation management to essential management trails and management of exotic species. • If deemed necessary, introduce additional fallen dead timber and rocks. 	<ul style="list-style-type: none"> • Within 3 months • Immediately upon detection • Completed prior to next annual monitoring event
	Weeds controlled and where possible eliminated	Annual vegetation and habitat monitoring shows no decrease in weed levels or the establishment of new weed incursions.	<ul style="list-style-type: none"> • Review of pest (weed) management strategy for the planning area if emerging weed threat detected through annual assessment. 	<ul style="list-style-type: none"> • Completed prior to next annual monitoring event.

MNES impacted	Specific milestones	Performance indicators	Corrective actions	Completion timeframes
	No removal of standing dead timber, fallen logs or rocks.	Annual vegetation and habitat monitoring detects removal of standing dead timber, fallen logs or rocks.	<ul style="list-style-type: none"> Additional remedial actions to restrict vehicle access if any removal of fallen timber or rocks is detected. 	<ul style="list-style-type: none"> Within 3 months of issue being identified.
	Fire regimes are appropriate for conservation of native plant and animal communities,	Annual vegetation and habitat monitoring shows decline in quality due to fire regime.	<ul style="list-style-type: none"> Review of the Fire Management Strategy (2006) for the planning area. 	<ul style="list-style-type: none"> Following two successive monitoring events where a decline related to fire is demonstrated and prior to the next annual monitoring event and/or proposed burn.
	Pest fauna controlled and where possible eliminated.	Results of bi-annual survey of pest fauna populations indicate maintained or increased number or density of pest fauna species.	<ul style="list-style-type: none"> Review of pest management strategy for the planning area. 	<ul style="list-style-type: none"> Annually
Grey-headed flying fox	Native vegetation is maintained or improved from current state.	Annual vegetation and habitat monitoring identifies no improvement, or a decline in (vegetation/habitat) condition, from baseline state.	<ul style="list-style-type: none"> Additional remedial actions to restrict vehicle access if any illegal clearing detected. Restriction of vegetation management to essential management trails and management of exotic species. 	<ul style="list-style-type: none"> Within 3 months Immediately upon detection

MNES impacted	Specific milestones	Performance indicators	Corrective actions	Completion timeframes
	Weeds controlled and where possible eliminated	Annual vegetation and habitat monitoring shows no decrease in weed levels or the establishment of new weed incursions.	<ul style="list-style-type: none"> Review of pest (weed) management strategy for the planning area if emerging weed threat detected through annual assessment. 	<ul style="list-style-type: none"> Completed prior to next annual monitoring event.
	Fire regimes are appropriate for conservation of native plant and animal communities.	Annual vegetation and habitat monitoring shows decline in quality due to fire regime.	<ul style="list-style-type: none"> Review of the Fire Management Strategy (2006) for the planning area. 	<ul style="list-style-type: none"> Following two successive monitoring events where a decline to fire is demonstrated and prior to the next annual monitoring even and/or proposed burn.
Swift parrot	Native vegetation is maintained or improved from current state.	Annual vegetation and habitat monitoring identifies no improvement, or a decline in (vegetation/habitat) condition, from baseline state.	<ul style="list-style-type: none"> Additional remedial actions to restrict vehicle access if any illegal clearing detected. Restriction of vegetation management to essential management trails and management of exotic species. 	<ul style="list-style-type: none"> Within 3 months Immediately upon detection
	Weeds controlled and where possible eliminated	Annual vegetation and habitat monitoring shows no decrease in weed levels or the establishment of new weed incursions.	<ul style="list-style-type: none"> Review of pest (weed) management strategy for the planning area if emerging weed threat detected through annual assessment. 	<ul style="list-style-type: none"> Completed prior to next annual monitoring event.
	Fire regimes are appropriate for conservation of	Annual vegetation and habitat monitoring shows decline in quality due to fire	<ul style="list-style-type: none"> Review of the Fire Management Strategy (2006) for the planning area. 	<ul style="list-style-type: none"> Following two successive monitoring events where a decline related to fire is

MNES impacted	Specific milestones	Performance indicators	Corrective actions	Completion timeframes
	native plant and animal communities.	regime.		demonstrated and prior to the next annual monitoring event and/or proposed burn.
Regent honeyeater	Native vegetation is maintained or improved from current state.	Annual vegetation and habitat monitoring identifies no improvement, or a decline in (vegetation/habitat) condition, from baseline state.	<ul style="list-style-type: none"> • Additional remedial actions to restrict vehicle access if any illegal clearing detected. • Restriction of vegetation management to essential management trails and management of exotic species. 	<ul style="list-style-type: none"> • Within 3 months • Immediately upon detection
	Weeds controlled and where possible eliminated	Annual vegetation and habitat monitoring shows no decrease in weed levels or the establishment of new weed incursions.	<ul style="list-style-type: none"> • Review of pest (weed) management strategy for the planning area if emerging weed threat detected through annual assessment. 	<ul style="list-style-type: none"> • Completed prior to next annual monitoring event.
	Fire regimes are appropriate for conservation of native plant and animal communities.	Annual vegetation and habitat monitoring shows decline in quality due to fire regime.	<ul style="list-style-type: none"> • Review of the Fire Management Strategy (2006) for the planning area. 	<ul style="list-style-type: none"> • Following two successive monitoring events where a decline related to fire is demonstrated and prior to the next annual monitoring event and/or proposed burn.

4.7 Monitoring

The NPWS will monitor biodiversity values at the Myall Creek Road offset site as part of their management of the Bungawalbin and Yarringully Parks and Reserves. Monitoring will include an annual assessment of the general extent and quality of habitat for the affected threatened fauna and the effectiveness of management actions as per the BSA requirements. The following monitoring programs and reports will apply:

- Vegetation and habitat monitoring, comprising a monitoring program to be completed by the NPWS annually, and including preparation of annual overviews of the condition of vegetation and habitat.
- Pest fauna control monitoring, comprising bi-annual survey of pest fauna populations and documenting of control activities.

4.8 Timing and responsibility for implementation of package

Table 4.7 details the timing and responsibility for the expected actions required to protect the site in perpetuity and for on-going management of the offset site.

Table 4.7: Required actions, timing and responsibility for implementation of the Devils Pulpit offset package.

Protection mechanism	Actions required	Target timeframe	Responsibility
NPWS Transfer	Submit revised Biodiversity Offset Package to DAWE	April 2020	TfNSW
	Approve Biodiversity Offset Package	May 2020	DAWE
	Transfer title to NPWS	July 2020	TfNSW
	Include in National Parks Estate	Upon property transfer	NPWS
	Commence management actions and annual monitoring	Within 3 months of gazettal	NPWS

5. Conclusion

The approved Biodiversity Offset Strategy for the Devils Pulpit upgrade identified biodiversity mitigation and offsetting measures to be implemented including fauna crossings, revegetation, flora salvage and translocation, two-stage clearing protocol, additional fauna mitigation measures, biodiversity monitoring during the construction and operational phases and biodiversity offsetting.

The Biodiversity Offset Package provides detail of the offsets undertaken for the Devils Pulpit upgrade including timeframes and completion status. This package has been developed in consultation with stakeholders and will deliver environmental outcomes for the community.

Under the Package, 386 ha of floodplain and riparian forest has been acquired and will be protected in perpetuity through environmental protection zoning provisions enacted under the *National Parks and Wildlife Act, 1974*. The property will initially be managed as a State Conservation Area in accordance with National Parks and Wildlife Service policies and the Plan of Management Bungawalbin and Yarringully Parks and Reserves (NSW NPWS, 2012).

The offset property contains a substantial area of known Giant Barred Frog habitat that is proposed to be available to offset impacts associated with other projects, with the addition of species specific management actions not required under the Package.

6. References

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- SEWPaC (2012). *Environment Protection and Biodiversity Conservation Act 1999: Environmental Offsets Policy*. Commonwealth of Australia.

Appendix A - Consultation with Stakeholders

Appendix B - Offset Strategy

Appendix C - Compensatory Habitat Assessment

Appendix D - DAWE offset assessment

Appendix E – NPWS Plan of Management for the Bungawalbin and Yarringully Parks and Reserves