Threatened Biodiversity Offset Status Report

Offset Status Report for MNES (Update 3)

23 June 2016

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ROADS AND MARITIME SERVICES

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JACOBS

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Document history and status

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Contents

Glossary

BOS	Biodiversity Offset Strategy
BOSR	Biodiversity Offset Status Report
CRAFTI	Comprehensive Regional Assessment Aerial Photography Interpretation
D4	Condition D4 of the Ministers Conditions of Approval
DEC	NSW Department of Conservation – now OEH
DECC	NSW Department of Environment Climate Change – now OEH
DECCW	NSW Department of Environment Climate Change and Water – now OEH
DEH	Department of Environment and Heritage (Commonwealth) – now DoE
DoE	Department of Environment (Commonwealth)
DPE	NSW Department of Planning and Environment
DPI	NSW Department of Primary Industries (Fisheries)
DSEWPaC	Department of Sustainability Environment, Water, Population and Communities (Commonwealth) – now DoE
EEC	Endangered Ecological Community
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
EP&A Act	*Environmental Planning and Assessment Act 1979*
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
FM Act	*Fisheries Management Act 1994*
GPS	Global Positioning System
HQS	Habitat Quality Score
IBRA	Interim Biogeographic Regionalisation for Australia
LGA	Local Government Area
LRSA	Lowland Rainforest of Subtropical Australia
MCoA	Ministers Conditions of Approval
MNES	Matters of National Environmental Significance (Commonwealth)
NCT	Nature Conservation Trust
NPWS	National Parks and Wildlife Service (now included under OEH)
NSW	New South Wales
OEH	Office of Environment and Heritage
PMST	Protected Matters Search Tool
Project	The Woolgoolga to Ballina Pacific Highway upgrade project and the associated area of direct impact required for the project and the associated infrastructure and construction compounds
Roads and Maritime	Roads and Maritime Services
RTA	Roads and Traffic Authority – now Roads and Maritime
SPIR	Submissions and Preferred Infrastructure Report
Study Area	Includes proposed offset properties and the Woolgoolga to Ballina Pacific Highway upgrade project
SSI	State Significant Infrastructure

Executive Summary

NSW Roads and Maritime Services (Roads and Maritime) has obtained approval for the Woolgoolga to Ballina (W2B) Pacific Highway upgrade project (the project) under Part 5.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) and the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). An Environmental Impact Statement (EIS) was prepared for the project which addressed the EPBC Act Environmental Offsets Policy (DSEWPaC 2012) and describes the Roads and Maritime commitment to provide offsets for Matters of National Environmental Significance (MNES) significantly impacted by the project.

The purpose of this report is to provide details to the Commonwealth Department of the Environment (DoE) as required by EPBC Act Condition 17, specifically on the status of offset site investigations for high priority MNES documented in Condition D4 of the NSW Minister for Planning's Conditions of Approval (MCoA). This Update 3 report follows the Update 2 and Update 1 offset status reports. Update 2 focused on the offset requirements for the two MNES listed in MCoA D4 impacted by early stage works (Section 1, 2 and soft-soil works) comprising Moonee Quassia (*Quassia* sp. Moonee Creek) and Sandstone Rough-barked Apple (*Angophora robur*), along with Singleton Mintbush and the Woombah/Iluka koala population. This report (Update 3) addresses the remaining shortfall in offset requirements for the Broadwater and Coolgardie/Bagotville Koala populations identified in Update 2, and confirms the security of offset requirements for Lowland Rainforest.

Detailed assessments have been completed for 26 properties to meet offsets requirements for high priority threatened communities and species. Of these 26 properties, 21 of these currently have proposed conservation areas developed in consultation with the landowners and a proposed works program. All properties are located within 30 kilometres of the project. Desktop assessments were undertaken in Update 1 to identify the type and extent of vegetation in the locality and on the properties being assessed and to identify threatened flora and fauna species and endangered ecological communities that may occur within proximity to these properties. Following the desktop assessment, site surveys were conducted on 18 properties during Update 2. In Update 3 the shortfalls identified for the Broadwater and Coolgardie/Bagotville Koala populations in Update 2 are specifically being addressed with an additional eight offset properties subject to biodiversity offset assessments, making a total of 26 properties ground-truthed to date. A separate Biodiversity Offset Assessment has been prepared for each property that details the field methods used and identifies the ecological values on the property and suitability of the site for meeting the offset requirements of the project (refer to Appendix E for separate Biodiversity Offset Assessments for each of the 26 properties). In summary the field survey activities in relation to high priority MNES included:

- Identification and mapping of critically endangered vegetation types present (ie. Lowland Rainforest). This included an assessment of key diagnostic characteristics and condition thresholds for Lowland Rainforest of Subtropical Australia.
- Targeted population counts and/or mapping of occupied habitat for nationally threatened flora populations with particular emphasis on Moonee Quassia (*Quassia sp. Moonee Creek*), Singleton Mint Bush (*Prostanthera cineolifera*) and Sandstone Rough-barked Apple (*Angophora robur*).
- Assessment of habitat condition by applying the BioBanking assessment condition methodology (DECC 2008a) to determine the condition of the vegetation relative to benchmark scores for regional vegetation (Biometric vegetation types). The number of plots applied at each property is described in the individual property reports (refer to Appendix E).
- Determine habitat quality scores for priority MNES and other threatened species.
- Assessment of the presence of and value of the habitat for Koala (*Phascolarctos cinereus*) by identifying and quantifying the proportion of Koala feed tree species present, identifying local Koala activity and determining appropriate habitat quality scores.

This report summarises the offset requirements for each of the priority MNES as documented in the EIS and identifies how the proposed offset properties achieve these offsets. Detailed information on the population size and distribution of ecological values is documented in individual property reports (refer to Appendix E), and the intent of the status report is to provide a summary of these outcomes. It is evident from the site surveys and

biodiversity offset assessments that the proposed offset areas investigated by Roads and Maritime will adequately meet 100 per cent or greater of the offset requirements for all of high priority MNES listed in Condition D4 of the MCoA.

In order to meet the requirement to secure offset properties for the priority MNES listed in MCoA D4, Roads and Maritime have, in addition to detailed ecological assessments, negotiated conservation areas to be protected in-perpetuity with required management actions. Conservation areas have been approved for seven of the Update 2 properties (Sites 2, 3, 9, 10, 12, 13 and 25) as a priority to meet the offset requirements for Moonee Quassia and Sandstone Rough-barked Apple, in addition to meeting offset requirements for Singleton Mint Bush and the Iluka/Woombah Koala population. As part of Update 3, conservation areas have been identified for Lowland Rainforest on four of the Update 2 properties (Sites 17, 22, 23 and 24) and for the Coolgardie/Bagotville koala population on two Update 2 properties (Sites 19 and 21). Draft conservation areas have been identified for the eight Update 3 properties (Sites 29, 30, 31, 32, 33, 34, 35 and 36) which includes the remaining offset requirements for the Broadwater and Coolgardie/Bagotville Koala populations. Roads and Maritime are awaiting final approval of these 14 assessed sites from DoE and the NSW Department of Planning and Environment (DPE), prior to finalising the conservation agreements with landowners.

The offset requirements for non-priority MNES and the NSW vegetation communities will be finalised within 24 months of approval of the offset strategy and outlined in the Biodiversity Offset Package. Offset implementation reports will be provided twice yearly, commencing in July 2016, or as agreed by the Department of Planning and Environment, until such time as the Biodiversity Offset Package is finalised.

Following final approval of the assessed sites, Roads and Maritime will provide funding in accordance with the Biodiversity Offset Strategy to undertake the required management actions on each site.

1. Introduction

1.1 Project overview

NSW Roads and Maritime Services (Roads and Maritime) has obtained approval for the Woolgoolga to Ballina (W2B) Pacific Highway upgrade project (the project/activity) under Part 5.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) and the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

An Environmental Impact Statement (EIS) and Submissions and Preferred Infrastructure Report (SPIR) was prepared for the project which addressed the EPBC Act Environmental Offsets Policy (DSEWPaC 2012) and describes the Roads and Maritime commitment to provide offsets for Matters of National Environmental Significance (MNES) significantly impacted by the project.

1.2 Purpose and objectives

The purpose of this report is to provide details to the Commonwealth Department of the Environment (DoE) as required by EPBC Act Condition 17, specifically on the status of offset site investigations for high priority MNES documented in Condition D4 of the NSW Ministers for Planning's Conditions of Approval (MCoA). This Update 3 report addresses the remaining shortfall in offset requirements for the Broadwater and Coolgardie/Bagotville Koala populations identified in Update 2, and confirms the security of offset requirements for Lowland Rainforest.

The following is an extract of Condition D4, and outlines the details addressed by this Update 3 report. Species and communities i-v below are described in this report as high priority MNES.

> *D4. Prior to the commencement of construction work that would result in the disturbance of the relevant existing ecological communities, threatened species, or their habitat, unless otherwise agreed by the Secretary, the Applicant shall submit for the approval of the Secretary, the offset sites for the species listed under condition D4(a). The selection of the offset sites should be undertaken in consultation with the OEH, DPI (Fisheries) and DoE.*
>
> *Submission of the offset sites for approval shall be accompanied by:*
>
> *(a) details of offset sites to compensate the impacts on:*
>
> *(i) Koala populations in Coolgardie/Bagotville, Broadwater and Woombah/Iluka;*
>
> *(ii) Moonee Quassia (Quassia sp. Moonee Creek);*
>
> *(iii) Sandstone Rough–Barked Apple (Angophora robur);*
>
> *(iv) Singleton Mint Bush (Prostanthera cineolifera); and*
>
> *(v) Lowland Rainforest in Sub-tropical Australia;*
>
> *(b) a map that defines the locations and boundaries of the sites;*
>
> *(c) demonstration, through ground truthing survey or an alternative method(s), the adequacy of the site(s), in terms of habitat suitability and presence of the relevant species, to offset the impacts of the SSI;*
>
> *(d) consideration of how the offsets achieve the outcomes required by the Environment Protection and Biodiversity Conservation Act 1999 Environmental Offsets Policy to the satisfaction of DoE; and*
>
> *(e) details of how the offset sites would be secured and managed in perpetuity.*

Update 2 focused on the offset requirements for the four MNES listed in MCoA comprising Moonee Quassia (*Quassia* sp. Moonee Creek), Sandstone Rough-barked Apple (*Angophora robur*), Singleton Mint Bush (*Prostanthera cineolifera*) and the Iluka/Woombah Koala population.

The MCoA D4 are listed in Table 1-1 along with the relevant section of the status report where each condition is addressed.

Table 1-1 NSW Ministers for Planning's Conditions of Approval D4 and relevant section of report

Condition No.	Condition	Relevant section
D4	The selection of the offset sites should be undertaken in consultation with the OEH, DPI (Fisheries) and DoE.	Section 1.3; Appendix D
D4a	Details of offset sites to compensate the impacts on:	
D4a(i)	*Koala populations in Coolgardie/Bagotville, Broadwater and Woombah/Iluka;*	Section 3.5
D4a(ii)	*Moonee Quassia (Quassia sp. Moonee Creek);*	Section 3.2
D4a(iii)	*Sandstone Rough–Barked Apple (Angophora robur);*	Section 3.3
D4a(iv)	*Singleton Mint Bush (Prostanthera cineolifera); and*	Section 3.4
D4a(v)	*Lowland Rainforest in Sub-tropical Australia;*	Section 3.1
D4b	A map that defines the locations and boundaries of the sites;	Figure 1-1; Appendix E
D4c	Demonstration, through ground truthing survey or an alternative method(s), the adequacy of the site(s), in terms of habitat suitability and presence of the relevant species, to offset the impacts of the SSI;	Appendix E
D4d	Consideration of how the offsets achieve the outcomes required by the *Environment Protection and Biodiversity Conservation Act 1999* Environmental Offsets Policy to the satisfaction of DoE; and	Section 3
D4e	Details of how the offset sites would be secured and managed in perpetuity.	Section 4

1.3 Selection of offset sites

The selection of offset sites was influenced by a number of criteria and aimed to find offsets that were of similar habitat and condition to the ecological values being impacted, this included:

- Consideration of the distance of the site to the project being within 30 kilometre radius of the upgrade where possible.
- Site habitat is of equal or greater quality to that being impacted.
- Habitat/vegetation types are the same or similar type.
- Direct offset to maintain biodiversity or suitability for revegetation to improve biodiversity on the site.

The properties detailed in this report are being presented as part of the ongoing consultation process with the agencies and for review and approval by DoE to allow finalisation of conservation agreements. Roads and Maritime are proceeding with conservation agreements on Sites 2, 3, 9, 10, 12, 13 and 25 as approved in Update 2. Roads and Maritime are seeking final approval to proceed with conservation agreements on Update 3 Sites 17, 19, 21, 22, 23, 24, 29, 30, 31, 32, 33, 34, 35 and 36. Detailed information is provided on each of these properties in this report.

Detailed assessments have been completed for 26 of the 36 properties identified during Updates 1, 2 and 3 to meet offset requirements for the high priority threatened communities and species likely to be impacted by the project. Detailed assessments also identify the presence of non-priority threatened species and ecological communities listed under state and federal legislation including habitat values, vegetation types and ecological condition.

The status of the remaining 10 properties is detailed in Table 1-2. Six of these sites will be assessed for inclusion in the final Biodiversity Offset Package to offset non-priority MNES and NSW vegetation communities, with the remaining four already assessed as unsuitable for the offset program or withdrawn by private landowners.

Separate biodiversity offset assessments are provided in Appendix E for each of the 26 properties that are the subject of this Update 3 report. Of these 26 properties, 21 currently have proposed conservation areas developed in consultation with the landowners (refer Table 1-2) and a proposed works program (refer to property reports in Appendix E). These properties meet the offset requirements for all of the priority MNES identified in the MCoA. The remaining five sites will be considered for inclusion in the Biodiversity Offset Package. The list of the properties is provided in Table 1-2 and their location shown on Figure 1-1.

Table 1-2 Potential offset sites for high priority species and communities (Update 2 and 3 properties shaded)

Site ID.	Adjacent Project Section	Location (Lot / DP)	Tenure	Area (approx. ha)	Investigation Status	Proposed covenant area (approx. ha)
1	1	Dirty Creek [redacted]	Private	42	Update 1 preliminary investigations only – unsuitable.	
2	3	Pillar Valley [redacted]	Private	363	Update 2 detailed targeted surveys and proposed covenant established	233
3	3	Tucabia [redacted]	Private	339		250
4	3	Pillar Valley [redacted]	Private	116	Update 2 detailed targeted surveys. Site will be assessed as part of the Biodiversity Offset Package.	
5	3	Pine Brush [redacted]	Private	341	Update 1 preliminary investigations only - unsuitable.	
6	3	Tyndal [redacted]	Private	152	After withdrawing from Update 1, landowner has re-entered the program. Site will be assessed as part of the Biodiversity Offset Package.	
7	3	Tyndale (Lot 7002 / DP92575 and Lot 7001 / DP92573)	Crown	249	Property withdrawn	
8	3	Tyndale [redacted]	Private	36	Update 1 preliminary investigations only – unsuitable.	
9	3	Tyndal [redacted]	Private	68	Update 2 detailed targeted surveys and proposed covenant established.	53
10	3	Tucabia [redacted]	Private	409		394
11	5	Maclean (Lot 20 and 23 / DP230180) (Lot 7040 / DP1115009 and Lot 1 / DP230182)	RMS	20	Update 1 preliminary investigations only – Some areas of this site have been offered to NPWS as a direct land transfer so will not be included in the offset	

Site ID.	Adjacent Project Section	Location (Lot / DP)	Tenure	Area (approx. ha)	Investigation Status	Proposed covenant area (approx. ha)
					package. Residual areas will be assessed for inclusion in the Biodiversity Offset Package.	
12	6	Mororo [redacted]	Private	160	Update 2 detailed targeted surveys and proposed covenants established.	106
13	6	Jackybulbin [redacted]	Private	585		517
14	8	Broadwater (Lot 6, 64 / DP755624)	RMS	22	Update 2 detailed targeted surveys. Site will be assessed as part of the Biodiversity Offset Package.	
15	8	Broadwater (Lot 212 / DP851963) (Lot 133 / DP839607) and (Lot 1 DP618666)	RMS	65	Update 1 preliminary investigations only. Some areas of this site have been offered to NPWS as a direct land transfer so will not be included in the offset package. Residual areas will be assessed for inclusion in the Biodiversity Offset Package.	
16	8	Bungawalbin (Lot 21 / DP 755601 and Lot 2 DP 1112483)	RMS	386	This property includes biodiversity offsets for the Devil's Pulpit Upgrade. 23 ha surplus area of habitat available for W2B project. Update 2 detailed assessment undertaken of surplus area. Will be included in the Biodiversity Offset Package.	
17	8	Buckombil [redacted]	Private	61	Update 2 detailed targeted surveys and proposed covenant established.	32
18	10	Wardell (Lot 7 / DP866508; Lot 1 and 2 / DP1123846; Lot 2 / DP1113572)	RMS	86	Update 1 preliminary investigations only – habitats suitable. Site will be assessed as part of the Biodiversity Offset Package.	
19	10	Wardell (Lot 2 / DP614714)	RMS	36	Update 2 detailed targeted surveys and proposed covenant established	19
20	10	Wardell (Lot 174 and Lot 154 / DP755731)	RMS	52	Site will be assessed as part of the Biodiversity Offset Package.	
21	10	Wardell (Lot 1 and Lot 2 / DP733934)	RMS	28	Update 2 detailed targeted surveys and proposed covenant established	24
22	10	Wardell (Lot 2 / DP543525)	RMS	72		30
23	10	Wardell [redacted]	Private	25		19
24	10	Wardell (Lot 61 / DP1088684)	RMS	31		26

Site ID.	Adjacent Project Section	Location (Lot / DP)	Tenure	Area (approx. ha)	Investigation Status	Proposed covenant area (approx. ha)
25	3	Pillar Valley (Lot 2 DP718612; Lot 9 DP1163255)	RMS	426	Property identified in Update 2 with detailed targeted surveys undertaken and proposed covenant established.	395
26	3	Tucabia [redacted])	Private	16	Property identified in Update 2 with detailed targeted surveys undertaken.	
27	1	Dirty Creek [redacted]	Private	160	Property identified in Update 2 with detailed targeted surveys undertaken. Landowner withdrew from Update 2. Property will be assessed for inclusion in the Biodiversity Offset Package.	
28	2/3	Lot 109 (DP751374) Sunnyside Road, Glenugie	RMS	600	This property includes biodiversity offsets for the Glenugie Upgrade. 219 ha surplus areas of habitat available for W2B project. Will be included in the Biodiversity Offset Package.	
29	10	[redacted] Wardell	Private	55	Additional properties identified in Update 3 with detailed targeted surveys undertaken in April/March 2016 and proposed covenants established.	16
30	10	[redacted] Wardell	Private	63		29
31	10	[redacted] Wardell	Private	19		19
32	10	Lot 6 (DP843369) Old Bagotville Road, Wardell	RMS	47		20
33	8	Lot 140 (DP755624) Pacific Highway, Woodburn	RMS	15		13
34	8	Lot 5 (DP1151619) Pacific Highway, Woodburn	RMS	23		14
35	8	[redacted] Doonbah	Private	104		99
36	8	[redacted] Woodburn	Private	107		17

1.4 Consultation

This Biodiversity Offset Status Report has been prepared in consultation with the Commonwealth Department of the Environment (DoE), the NSW Department of Primary Industries (Fisheries) and the NSW Office of Environment and Heritage (OEH), the NSW Environment Protection Agency (EPA) and the NSW Department of Planning and Environment (DPE). Comments on the status report were provided by the DoE, the DPE and the EPA. These comments along with how they were addressed in the report are provided in Appendix D. The key modifications to the report as a result of this consultation with consent authorities (refer to Appendix D) are listed below:

- All Update 1 and Update 2 properties are now listed in Table 1-2 and as part of Update 3, eight additional properties have also been added.

- Survey limitations have been added to the status report (Section 2.5).
- Impacts and offsets for Koala populations identified in MCoA D4 have been assessed separately rather than collectively.
- A summary is now provided of the actions that will be undertaken to deliver the offset sites and an indicative timeframe.
- Inconsistencies between the Biodiversity Offset Strategy and the Biodiversity Offset Status Report have been addressed.
- Biodiversity Offset Assessment reports for each of the 26 Update 2 and Update 3 properties are attached as Appendix E.
- Suitable habitat for all non-priority threatened species and ecological communities on the offset properties is now summarised in Appendix B and C, and the area of biometric vegetation types is summarised in Appendix A.
- Further detail is provided in the Biodiversity Offset Assessment reports for each of the 26 Update 2 and Update 3 properties in regard to where the proposed offset properties are located relative to identified key habitat and corridors and how these offsets provide strategic habitat linkages.
- Further detail regarding potential indirect impacts from the project to each of the offset properties is now provided in the Biodiversity Offset Assessment reports for each of the 26 Update 2 and Update 3 properties, along with discussion of proposed connectivity structures in the vicinity of proposed offsets.
- Targeted surveys have been undertaken for priority species which cannot be accurately predicted based on habitat assessment (ie Long-nosed Potoroo, Giant Barred Frog, and Oxleyan Pygmy Perch).

2. Site Assessment

2.1 Desktop appraisal

Desktop assessment was undertaken to identify the type and extent of vegetation in the locality and associated with the properties being assessed and to identify previous data and records of threatened flora and fauna species and endangered ecological communities that may occur within proximity to these properties. The data sources used in the review included:

- Mitchell Landscapes (Mitchell 2003).
- Regional vegetation maps; CRAFTI (NPWS 1998).
- OEH Atlas of NSW Wildlife for records of threatened flora and fauna species in the region.
- EPBC Act Protected Matters on-line Search Tool (PMST) for records and predictions of threatened flora and fauna in the region (MNES).
- Key habitats and wildlife corridors (DEC 2003; DECC 2007).
- High-Resolution Aerial Photography.

2.2 Ground-truthing surveys

Following the desktop assessment, site surveys were conducted on each of the 26 properties identified in Table 1-2. A separate report was then prepared for each property that details the field methods used and identifies the ecological values on the property and suitability of the site for meeting the offset requirements of the project (refer to Appendix E). Section 3 of the report describes the offset requirements for high priority MNES and the offsets achieved by each property. In summary the field survey activities in relation to high priority MNES included:

- Identification and mapping of critically endangered vegetation types present (ie. Lowland Rainforest). This included an assessment of key diagnostic characteristics and condition thresholds for Lowland Rainforest of Subtropical Australia.
- Targeted population counts and/or mapping of occupied habitat for nationally threatened flora populations with particular emphasis on Moonee Quassia (*Quassia sp. Moonee Creek*), Singleton Mint Bush (*Prostanthera cineolifera*) and Sandstone Rough-barked Apple (*Angophora robur*).
- Assessment of habitat condition by applying the BioBanking assessment condition methodology (DECC 2008a) to determine the condition of the vegetation relative to benchmark scores for regional vegetation (Biometric vegetation types). The intent of the method was to determine habitat quality for priority MNES. The number of plots applied at each property is described in the individual property reports (refer to Appendix E).
- Assessment of the presence of and value of the habitat for Koala (*Phascolarctos cinereus*) by identifying and quantifying the proportion of Koala feed tree species present and recording evidence of koala activity.

Further details on field survey methods for each of the priority MNES are specified below:

Lowland Rainforest of Subtropical Australia

The EPBC Act focuses legal protection on patches of the critically endangered Lowland Rainforest of Subtropical Australia that are most functional, relatively natural and in relatively good condition. Heavily degraded or modified patches are largely excluded. As such, the EPBC Act listed critically endangered Lowland Rainforest of Subtropical Australia ecological community is differentiated from the state listed community through the application of key diagnostic characteristics and condition thresholds.

The field surveys were designed to collect data on these key diagnostic characteristics which included:

- Distribution of the ecological community is primarily in the NSW North Coast and South Eastern Queensland bioregions, according to Interim Biogeographic Regionalisation for Australia (IBRA) version 6.1.
- The ecological community occurs on: soils derived from basalt or alluvium; or enriched rhyolitic soils; or basaltically enriched metasediments.
- The ecological community generally occurs at an altitude less than 300 metres above sea level.
- The ecological community typically occurs in areas with high annual rainfall (>1300 millimetres).
- The ecological community is typically more than 2 kilometres inland from the coast.
- The structure of the ecological community is typically a tall (20–30 metres) closed forest, often with multiple canopy layers.
- Patches of the ecological community typically have high species richness (at least 30 woody species from Appendix A of the commonwealth listing advice for the community).

The condition thresholds assessed in the field are outlined in Table 2-1.

Table 2-1: Condition threshold for the EPBC Act listed Lowland Rainforest of Subtropical Australia

Patch Type (evidence of remnant vegetation & regeneration status)	**A** Natural remnant evidenced by the persistence of mature residual trees as listed in the listing advice for this community. **AND**	**B** Some residual trees from listing advice of this community are present plus evidence of either; natural regeneration*1 **AND/OR** regeneration with active management*2 **AND**	**C** A non-remnant patch that has recovered through a) natural regeneration*1 **AND/OR** b) supplementary planting that has stature and quality that is reflective of the „Description*3 **AND**
Patch Size (excludes buffer zone)	≥ 0.1 hectares **AND**	≥ 1 hectares **AND**	≥ 2 hectares **AND**
Canopy Cover (over entire patch)*4	Emergent/canopy/sub-canopy cover is ≥ 70% **AND**		
Species Richness (over entire patch)	contains ≥ 40 native woody species*5 from listing advice (for this community **AND**	contains ≥ 30 native woody species *5 from listing advice (Appendix A) **AND**	
Percent of total vegetation cover that is native *6 (use sample plot)	≥ 70% of vegetation*6 is native	≥ 50% of vegetation*6 is native	

Notes:

*1 Evidence of natural regeneration is shown by the presence of seedlings of a range of native species that did not originate through deliberate plantings.

*2 A patch that is **actively managed** has regular (eg every 1–2 years) on the ground human regenerative activity such as weed control or supplementary plantings.

*3 Closed canopy, 20–30 m tall, of representative species (eg white booyong, hoop pine, figs, brush box, yellow carabeen, red cedar, rosewood, white beech)

*4 Canopy cover (projective foliage cover) is estimated over the entire patch. When assessing the ecological community, the canopy includes the emergents and subcanopy (everything above 10 m tall). Canopy/sub-canopy includes all trees and vines (native and non-native).

*5 Woody species are trees, shrubs or vines hat contain wood or wood fibres that consist mainly of hard lignified tissues. Excluded from woody species are graminoids, o her herbs and non-woody vines.

*6 Total vegetation cover includes emergents/canopy/subcanopy and understorey and ground layers.

Koala (populations in the Coolgardie/Bagotville, Broadwater and Woombah/Iluka areas)

The proportion of Koala feed tree species (primary, secondary and supplementary species) was quantified for each map unit on the property. The list of feed tree species for the NSW North Coast Management area follows Appendix 2 of the Koala Recovery plan (DECC 2008). The count of tree species proportion was conducted at each habitat assessment plot. A search was conducted at each habitat assessment plot for Koala scats by sampling a minimum of 20 trees. As the Condition D4 of the MCoA specifies offset requirements for areas occupied by three important Koala populations, the inputs into the calculator are based on the impacts and potential offsets for the three separate population areas in the project and not Koala habitat across the entire project. Koala habitat being impacted outside of these three population areas will be offset as part of the Biodiversity Offset Package.

The classification of Koala habitat followed those described in the Koala Recovery Plan (DECC 2008) as described in the following:

- **Primary habitat:** Areas of forest or woodland where primary Koala food tree species comprise at least 50% of the overstorey trees. Capable of supporting high-density Koala populations.
- **Secondary habitat (class A):** Areas of forest or woodland where primary Koala food tree species comprise less than 50% but at least 30% of the overstorey trees; or Areas of forest or woodland where primary Koala food tree species comprise less than 30% of the overstorey trees, but together with secondary food tree species comprise at least 50% of the overstorey trees; or Areas of forest or woodland where secondary food tree species alone comprise at least 50% of the overstorey trees (primary Koala food tree species absent). Capable of supporting high to medium-density Koala populations.
- **Secondary habitat (class B):** Areas of forest or woodland where primary Koala food tree species comprise less than 30% of the overstorey trees; or Areas of forest or woodland where primary Koala food tree species together with secondary food tree species comprise at least 30% (but less than 50%) of the overstorey trees; or Areas of forest or woodland where secondary food tree species alone comprise at least 30% (but less than 50%) of the overstorey trees (primary Koala food tree species absent). Capable of supporting medium to low-density Koala populations.
- **Secondary habitat (class C):** Areas of forest or woodland where Koala habitat is comprised of secondary and supplementary food tree species (primary Koala food tree species absent), where secondary food tree species comprise less than 30% of the overstorey trees. Capable of supporting low-density Koala populations.
- **Tertiary habitat:** Areas of forest or woodland where food tree species are absent. These areas provide refuge and connectivity between patches of primary and secondary habitat.

Primary and secondary habitats in addition to supporting being dominated or co-dominated by primary and secondary feed tree species, may also include a range of supplementary tree species. Tertiary habitats support supplementary tree species and primary and secondary feed species are absent.

Moonee Quassia (*Quassia* sp. *Moonee Creek*)

Suitable habitat for this species was targeted on rocky slopes and gullies with sandstone influence by initial random meander. Where individuals and populations were encountered counts of stems were then undertaken and recorded as a series of GPS waypoints which is consistent with methodology for the data collected in the project footprint for the EIS. The counting of stems was considered more appropriate as the extent of each individual was unknown (as this plant is known for suckering, shoots would grow from lateral roots or buried stems and may emerge some distance from the originating plant). Therefore the offset assessment has been based on the number of stems.

Sandstone Rough-barked Apple (*Angophora robur*)

The methods for mapping known occupied habitat by *Angophora robur* were consistent with the methods used for mapping the species in the project footprint undertaken for the EIS. Suitable habitat was targeted using a

random meander approach targeted at undulating sandstone habitat. Where the species was encountered the distribution was mapped as a series of waypoints including rapid point counts, and the edges of the species distribution was identified in the field, including mapping polygons. Occupied habitat was primarily mapped using field survey data and field observations of the habitat preferences, distribution and abundance of Sandstone Rough-barked Apple on each offset site. Spatial layers including topography, soil landscapes and vegetation communities also facilitated mapping of habitat considering the widespread distribution of this species in the locality particularly in areas where field data was limited.

Singleton Mint Bush (*Prostanthera cineolifera*)

The methods for mapping known occupied habitat by *Prostanthera cineolifera* were consistent with the methods used for mapping the species in the project footprint undertaken for the EIS. Suitable habitat was targeted using a random meander approach. Where the species was encountered the distribution was mapped as a series of waypoints including stem counts and suitable adjacent habitat was identified and mapped within 5-10 metres of plant occurrences. Considering this species tends to regrow following disturbance from buried stems or the root system, the offset calculator for this species is based on the area of occupied habitat.

2.3 EPBC Act Environmental Offsets Policy and calculator

The EPBC Act Environmental Offsets Policy (DSEWPaC, 2012) and the Offset assessment guide (the calculator) provide a methodology for the calculation of offset requirements for MNES. This methodology was applied at the EIS stage based on the area and quality of habitat to be impacted by the project, to calculate the offset requirements for high priority MNES. These offset requirements are presented in Section 3 of this report along with an accompanying section to detail how the offsets are achieved using the field survey data and offset calculator.

2.4 Habitat quality scores

Habitat quality scores (HQS) were assigned to habitat polygons for the five priority MNES on the offset properties using a similar methodology and rationale as detailed for the impacted habitats in the W2B Biodiversity Offset Strategy. The habitat quality scores were consistent across the offset properties for Lowland Rainforest (9) and *Prostanthera cineolifera* (9). Habitat quality scores were attributed to habitat polygons for *Angophora robur* and Koala habitat and were based on habitat condition, stocking rates and site context such as connectivity and patch size, taking into consideration future impacts from the project. No habitat quality scores were used for *Quassia* sp. Moonee Creek due to stem counts being used in the EPBC Act offsets assessment guide calculations. A conservative approach to the habitat quality scores on the offset properties has been implemented to take into account future indirect impacts from the project.

2.5 Survey limitations

Biodiversity surveys undertaken on the offset properties targeted the above high priority MNES, and seasonal and climatic conditions were sufficient to detect these species and/or suitable habitat, however, the following limitations apply:

- Survey timing limited the potential for cryptic and seasonal species being detected which have potential to be present. Some cryptic species were recorded on site in low abundance which are likely to expand as conditions become more favourable (ie increased rainfall and temperature).
- Considering the large size of some of the properties and extent of potential habitat for threatened flora species, there is potential for other threatened flora and fauna populations that were not identified from the survey to be present in parts of the site not covered by the general traverses and stratified plot-based assessment or identified in opportunistic surveys. Several surveys over different seasons are often required to identify the full suite of flora and fauna species that occur over large sites.

3. Outcomes of the Offset Assessment

Section 3 summarises the offset requirements for each of the priority MNES as documented in the EIS and identifies how the offset properties proposed achieve these offsets. Detailed information on the population size and distribution of ecological values is documented in individual property reports (Appendix E), and the intent of the status report is to provide a summary of these outcomes.

3.1 Lowland Rainforest of Subtropical Australia

Offset requirements

The project would result in direct impacts on 1.88 hectares of Lowland Rainforest, with HQS ranging from 7 to 9. There would also be potential indirect impacts on the remaining areas of the impacted patches, comprising about 1.37 hectares. Indirect impacts have been calculated by measuring the remaining area of rainforest patches where patch viability is expected to be reduced (all of the remaining areas of patch 1 (1.29 hectares) and the remaining areas of patch 2 downslope on the eastern side of the project (1.36 hectares)) and a small area of patch 3 comprising the area within 20 metres of the construction edge (0.09 hectares). As mitigation measures would be implemented to minimise potential indirect impacts, and because of the conservative nature of the above estimate, only half of this potential indirect impact has been assigned to the calculator (that is, 1.37 hectares). This approach is consistent with the Threatened Flora Management Plan for the project.

According to the values assigned to the calculator (refer to Table 3-1), the proposed offset properties supporting a total of 49.2 hectares of Lowland Rainforest with similar habitat quality would be sufficient to offset greater than 100% of the 1.88 hectares of direct impacts and the 1.37 hectares of indirect impacts. Due to the critically endangered status of this ecological community a larger degree of offset is required compared with endangered and vulnerable listed protected matters.

Table 3-1 Lowland Rainforest – impacts and rationale for offset measures

Attribute	Values				Rationale
	HQS 7	HQS8	HQS 9	HQS 9	
IMPACT AREA					
Area (ha)	0.5	1.05	1.7		The area of direct impact to rainforest habitats which conform to the condition criteria for the critically endangered community. The total area comprises 1.88 ha of direct impacts and 1.37 ha of indirect impacts, of which 0.5 ha has a HQS of 7, 1.05 ha has a HQS of 8 and 1.7 ha with a HQS of 9
Start quality (scale of 0-10)	7	8	9	9	Scores are based on the habitat quality scores assigned to each patch impacted by the proposal from habitat quality field assessments.
OFFSET AREA					
Risk-related time horizon (max. 20 years)	20	20	20	20	This describes the timeframe over which changes to the in the level of risk to a proposed offset site can be considered and quantified. This value is capped at 20 years or the life of an offset whichever is shorter. Considering the offset is proposed to be established in perpetuity, the maximum risk-related time horizon was assigned.

Attribute	Values				Rationale
Time until ecological benefit (years)	10	10	10	10	Although an offset site would support high quality rainforest habitats, restoration measures would likely be required to manage/eliminate existing threatening processes and improve habitat quality attributes. Management activities to minimise existing threats are likely to be achieved within 10 years.
Area (ha)	5.3 (100% of Site 24)	14.3 (100% of Site 23)	11.3 (100% of Site 17)	18.3 (100% of Site 22)	A total offset area of 49.2 hectares of high condition (HQS 9) lowland rainforest has been identified on Sites 17, 22, 23 and 24.
Start quality (scale of 0-10)	9	9	9	9	Scores are based on the good habitat condition, connectivity and high species diversity on the proposed offset properties (Sites 17, 22, 23 and 24).
Risk of loss (%) without offset	30	30	30	30	Considering the existing threats to areas of lowland rainforest on private property are likely to include weed invasion, livestock, feral fauna species, ongoing clearing and underscrubbing for development and/or other activities such as agriculture/hobby farming, a risk of loss without the offset has been identified as 30%.
Future quality without offset (scale of 0-10)	8	8	8	8	Considering the likely existing threats to areas of lowland rainforest on private property, the future quality has been reduced by a single point from the start quality.
Risk of loss (%) with offset	10	10	10	10	Considering the existing high level of threat to lowland rainforest a residual risk of 10% has been assigned.
Future quality with offset (scale of 0-10)	9	9	9	9	It is envisaged with the implementation of management and restoration measures the future quality of the offset would be maintained at existing levels
Confidence in result (%)	90	90	90	90	There is a high confidence of a potential offset providing an improved outcome for lowland rainforest provided adequate restoration, monitoring and management actions are implemented.
% of impact offset	115%	130%	147% (56% + 91%)		This scenario would provide for greater than 100% of the required offset.

Offsets achieved

The area required to meet greater than 100 per cent of the offset for Lowland Rainforest of Subtropical Australia (LRSA) can be achieved on the proposed offset properties. This is based on the presence of a total of around 49.2 hectares of high condition LRSA in the proposed conservation areas on Sites 17, 22, 23 and 24, and the specified parameters input into the calculator and associated rationale. The habitat quality of the proposed offset properties (HQS 9) is generally higher in comparison to areas of lowland rainforest in the impact area.

The potential area of LRSA within the conservation area on each of the proposed offset sites available for offsetting the impacts of the project are specified in Table 3-2 along with the proportion of impact for each HQS being offset by each site.

Table 3-2 Potential offsets available for Lowland Rainforest (EPBC Act)

Site	Offset area and HQS (ha)	Impact area and HQS (ha)	Proportion of total offset requirement achieved
17	11.3 (HQS 9)	1.7 (HQS 9)	56%
22	18.3 (HQS 9)		91%
23	14.3 (HQS 9)	1.05 (HQS 8)	130%
24	5.3 (HQS 9)	0.5 (HQS 7)	115%
Total	**49.2 hectares**	**3.25 hectares**	**>100%**

3.2 Moonee Quassia (Quassia sp. Moonee Creek)

Offset requirements

Surveys of this species for the EIS and SPIR recorded a total of 899 stems, of which 35 would be directly impacted in the project footprint and up to 167 stems within 10 metres of the construction edge would be indirectly impacted. Additional investigations during threatened flora preconstruction surveys (Jacobs 2014) found no major changes to the spatial distribution and abundance of *Quassia* sp. Moonee Creek from previous surveys.

Design amendments in Section 1 have resulted in an increased direct impact to 73 stems of *Quassia* sp. Moonee Creek, and indirect impacts of 137 stems within 10 metres of the clearing boundary. The total impact is 210 stems, an increase of eight stems.

Indirect impacts could result from altered exposure and light levels and increased potential for competition from weeds and other flora due to the altered conditions. The counting of stems was considered more appropriate as the extent of each individual was unknown (as this plant is known for suckering, shoots would grow from lateral roots or buried stems and may emerge some distance from the originating plant). Therefore the offset assessment has been based on the number of stems.

According to the calculator the combined total of *Quassia* sp. Moonee Creek stems (2530 stems) with restoration measures to increase the population by at least 10% would provide for 171 per cent of the required offset area. The values and a rationale for the offset measures are provided in Table 3-3.

Table 3-3 *Quassia sp.* Moonee Creek – impacts and rationale for offset measures

Attribute	Value	Rationale
IMPACT AREA		
Number of individuals impacted	210	A total of 210 stems will potentially be impacted (73 direct and 137 indirect)
OFFSET AREA		
Time horizon (years)	20	This describes the timeframe over which changes to the level of risk to a proposed offset site can be considered and quantified. This value is capped at 20 years or the life of an offset whichever is shorter. Considering the offset is proposed to be established in perpetuity, the maximum risk-related time horizon was assigned.
Start value (number of individuals)	2530	A total of 2530 stems of *Quassia* sp. Moonee Creek have been identified on offset properties (Sites 2, 3 and 25) with similar habitat quality to the impact area.
Future value without offset (number of individuals)	2277	The existing threats to areas of habitat on private property are likely to include ongoing clearing and underscrubbing for development and/or other activities such as agriculture/quarries. The future value of the offset includes a reduction of 253 stems (10%) in recognition of these ongoing threats.
Future value with	2783	A future site value of 2783 individuals has been assigned based on the potential for

Attribute	Value	Rationale
offset (number of individuals)		ongoing management improving habitat conditions to facilitate natural recruitment of individuals increasing the start value by 10% (253 stems). The future value may be greater than a 10% increase if translocation, plantings and/or direct seeding restoration activities are implemented on any of the proposed offset sites.
Confidence in result (%)	90	There is a high confidence of a potential offset considering the existing number of individuals that would potentially be protected providing an improved outcome for the species. This is based on adequate restoration, monitoring and management actions being implemented.
% of impact offset	171	This scenario would provide for 171% of the required offset.
Other measures (up to 10%)	10	There is potential to provide up to 10% of the offset as other measures. This may include restoration of areas of habitat and/or contributions towards research of the species. Other measures will also be implemented for the species recovery including translocation of potentially impacted plants within adjacent suitable habitat within the road boundary.

Offsets achieved

According to the calculator, the *Quassia* sp. Moonee Creek populations in proposed offset covenants would provide greater than 100% of the required offset (refer to Table 3-4).

Table 3-4 Potential offset sites for Moonee Quassia

Site	Offset value	Offset (no. of stems)	Approximate proportion of offset met
2	At least 405 stems of Moonee Quassia present.	405 stems	27.35%
3	Large populations of Moonee Quassia with at least 1308 stems counted	1308 stems	88.45%
25	Large population of Moonee Quassia with at least 817 stems counted	817 stems	55.37%
Total		**2530 stems**	**171.17%**

3.3 Sandstone Rough-barked Apple (*Angophora robur*)

Offset requirements

The SPIR assessed impacts to 84.1 hectares of occupied habitat for the species, containing an estimated 7,056 individuals. Additional investigations during threatened flora preconstruction surveys (Jacobs 2014) found several additional occurrences of *Angophora robur* on areas unable to be accessed during the SPIR surveys. The current clearing boundary will directly impact 91.68 hectares of occupied habitat for *Angophora robur,* containing an estimated 6,551 individuals.

The number of individuals that would be impacted has been quantified along with the area of habitat. However, for this assessment, the area of habitat is considered more appropriate to provide an estimate of the offset requirements, rather than population number.

Indirect impacts on the remaining individuals of *Angophora robur* adjacent to the project footprint are not anticipated to be substantial and mitigation measures would be implemented to manage weeds, water quality and diseases that may potentially result in indirect impacts on individuals and habitats. The project footprint would be downstream of the majority of the retained individuals. Considering *Angophora robur* has been observed growing in edge-affected habitats throughout the study area and grows in low nutrient soils with a lower susceptibility to weeds (including roadsides), impacts from edge effects are not anticipated to be substantial. The values and a rationale for the offset measures are provided in Table 3-5.

Table 3-5 *Angophora robur* – impacts and a rationale for offset measures

Attribute	Values				Rationale
	HQS 7	HQS 8	HQS 9	HQS 10	
IMPACT AREA					
Area (ha)	1.26	14.65	8.48	67.29	A total area of 91.68 of habitat occupied by *Angophora robur* will be directly impacted by the project.
Start quality (scale of 0-10)	7	8	9	10	The habitat quality scores were assigned based on the habitat quality scores within the area occupied by the species determined from habitat quality field assessments.
OFFSET AREA					
Time over which loss is averted (max. 20 years)	20	20	20	20	This describes the timeframe over which changes to the level of risk to a proposed offset site can be considered and quantified. This value is capped at 20 years or the life of an offset whichever is shorter. Considering the offset is proposed to be established in perpetuity, the maximum risk-related time horizon was assigned.
Time until ecological benefit (years)	5	5	5	5	Considering the relatively high condition and moderate/minimal threats to the majority of habitat in the locality occupied by *Angophora robur*, there is envisaged to be minimal management requirements on a potential offset site supporting a relatively large area of occupied habitat. Therefore five years has been assigned for the establishment and initial management of an offset site, and similarly the time until ecological benefit has been assigned the same value.
Area (ha)	10.4 (Site 2 100% of HQS 8)	60 (Site 2 100% of HQS 10)	61.2 (Site 3 100% of HQS 10)	360 (Site 25 100% of HQS 10)	A total offset area of 708.8 hectares of occupied habitat has been identified on Sites 2, 3, 4, 9, 10, 25 and 26. The habitat quality scores varied on the offset sites varied between 10 and 8. 501.4 ha of habitat on Sites 2, 3 and 25 are sufficient to meet the offset requirements.
Start quality (scale of 0-10)	8	10	10	10	Habitat quality of a potential offset site has been assessed and is generally higher (HQS 8-10) than the habitats in the impact area (HQS 7-10)
Risk of loss (%) without offset	16	16	16	16	The existing threats to areas of occupied habitat on private property are likely to include weed invasion, livestock, feral fauna species, ongoing clearing and underscrubbing for development and/or other activities such as agriculture/quarries and altered fire regimes. As such, a risk of loss without the offset has been identified as 16%.
Future quality without offset (scale of 0-10)	7	9	7	9	Considering the likely existing threats to areas of occupied habitat on private property, the future quality has been reduced by a single point from the start quality.
Risk of loss (%) with offset	1	1	1	1	An offset site would substantially reduce the risk of loss by eliminating the majority of threats to the species, however some residual risk is considered to be present and a value of 1% has been assigned.
Future quality with offset (scale of 0-10)	9	10	9	10	It is envisaged with the implementation of management and restoration measures, the future quality of the offset would be increased by at least one point (or maintained at existing levels where habitat quality is 10).

Attribute	Values				Rationale
Confidence in result (%)	90	90	90	90	There is a high confidence of a potential offset providing an improved outcome for *Angophora robur* provided adequate restoration, monitoring and management actions are implemented.
% of impact offset	314	105	164	109	This scenario would provide for greater than 100% of the required offset.

Offsets achieved

The above offsetting scenario (refer to Table 3-5) would provide for greater than 100 per cent of the offset required for *Angophora robur*. Occupied habitat was identified on seven potential offset sites together comprising up to 708.8 hectares, of which 501.4 hectares across three properties with proposed conservation covenants (Site 2, 3 and 25) have been identified to achieve greater than 100% of the required offset (refer to Table 3-6). The habitat quality of the proposed offset properties (8-10) is generally higher in comparison to areas of *Angophora robur* in the impact area.

Table 3-6 Potential offsets for *Angophora robur* (grey shading indicates same impact area (HQS 7) being assessed)

Site	Offset value	Habitat quality score	Occupied habitat (ha)	Impact area and HQS being offset (ha)	Proportion of offset requirement achieved
2	Several large to medium sized populations of *Angophora robur*	10	60	14.65 (HQS 8)	105%
		8	10.4	1.26 (HQS 7)	314%
3	Large populations of *Angophora robur* occurring across high quality habitats	10	61.2	8.48 (HQS 9)	164%
		8	3.8	1.26 (HQS 7)	115%
4	Moderate sized populations of *Angophora robur*	10	25.9		
		8	12.4		
9	Large population of *Angophora robur* occurring across high quality habitats	10	41.3		
		8	8.8		
10	Several large to medium sized populations of *Angophora robur*	10	113.2		
		8	0.1		
25	Very large population of *Angophora robur* occurring across several high quality habitat types	10	360	67.29 (HQS 10)	109%
		8	6	1.26 (HQS 7)	181%
26	Medium sized population of *Angophora robur* adjoining project	10	4.6		
		8	1.1		
Total			**708.8 ha**	**91.68 ha**	

3.4 Singleton Mint Bush (*Prostanthera cineolifera*)

Offsets required

Prostanthera cineolifera (Singleton Mint Bush) was recorded in Section 6. This species was recorded along Tabbimoble Creek inhabiting a narrow belt of deep sandy soils on the creek banks and surrounding flats. Impacts on *Prostanthera cineolifera* were estimated in the SPIR to consist of 250 individuals occurring over 0.4 hectares, from an estimated population of 5000 to 8000 individuals occurring over around 2.2 hectares surrounding Tabbimoble Creek. The taxonomic status and distribution of this species and other species in the same genus is uncertain.

Given the high density of plants of the species across a relatively small area, the assessment is based on the area of impact on habitat occupied by this species. The area of occupied habitat was mapped by enclosing all point records for the species with polygons and applying a five metre buffer to account for GPS error and

potential indirect impacts. HQS for the species were based on presence of suitable habitat, habitat disturbances and confirmed presence of the species.

There is potential for indirect impacts on this species, but habitat for the species impacted is currently edge-affected and open to livestock, so the species is likely to be somewhat tolerant of edge effects and it persists in areas adjacent to the existing highway. Proposed mitigation measures would limit the potential for indirect impacts to have a substantial impact on the surrounding population.

The values and a rationale for the offset measures are provided in Table 3-7.

Table 3-7 Prostanthera cineolifera – impacts and rationale for offset measures

Attribute	Value Site 12	Value Site 13	Rationale
IMPACT AREA			
Area (ha)	0.42	0.42	Impacts to occupied habitat are 0.42 hectares
Start quality (scale of 0-10)	8	8	Considering the existing habitat disturbances in the impact area from cattle grazing, weed invasion and edge effects, the habitat quality of the impact area has been reduced by two points
OFFSET AREA			
Time over which loss is averted (max. 20 years)	20	20	This describes the timeframe over which changes to the level of risk to a proposed offset site can be considered and quantified. This value is capped at 20 years or the life of an offset whichever is shorter. Considering the offset is proposed to be established in perpetuity, the maximum risk-related time horizon was assigned.
Time until ecological benefit (years)	5	5	Existing threats to the species on offset properties will need to be managed including fencing and weed removal. A 5 year period has been allowed for management actions to be implemented.
Area (ha)	2.5 (Site 12)	1.2 (Site 13)	A total 3.7 ha of habitat occupied by *Prostanthera cineolifera* was identified on the proposed offset properties, including 2.5 ha on Site 12 and 1.2 ha on Site 13.
Start quality (scale of 0-10)	8	9	The habitat quality of Site 12 is expected to be similar to that of the impact site (HQS) being part of the same patch with similar habitat conditions. The habitat quality of Site 13 is higher being subject to fewer disturbances.
Risk of loss (%) without offset	15	15	Considering the existing threats to this species on private property comprising ongoing degradation of habitat, weed invasion and removal of plants for agricultural activities the risk of loss without offset has been identified as 15%.
Future quality without offset (scale of 0-10)	7	8	Existing threats to populations on the potential offset site have the potential to further degrade habitat. It has been assumed the future quality is reduced by a single point from the start quality.
Risk of loss (%) with offset	1	1	An offset site would substantially reduce the risk of loss by eliminating the majority of threats to the species, however some residual risk is considered to be present and a value of 1% has been assigned.
Future quality with offset (scale of 0-10)	9	10	It is envisaged with the implementation of management and restoration measures the future quality of the offset would be improved primarily through weed management actions. The future quality has therefore been increase by one point from the start value.
Confidence in result (%)	90	90	There is a high confidence of a potential offset providing an improved outcome for Prostanthera cineolifera provided adequate restoration, monitoring and management actions are implemented.
% of impact offset	189	95	Both of the potential offset properties achieve the minimum offset

Attribute	Value Site 12	Value Site 13	Rationale
			requirement of 90%.
Other measures (up to 10%)	10	10	There is potential to provide up to 10% of the offset as other measures. This may include restoration of areas of habitat and/or contributions towards research of *Prostanthera cineolifera*. Considering the uncertain taxonomic status and distribution of the species, scientific research into these factors would substantially contribute towards the conservation of the species. There is potential for substantial translocations into disturbed areas of potential habitat within the existing road boundary.

Offsets achieved

Greater than 90 per cent of the offset requirements for *Prostanthera cineolifera* can be achieved on Site 12 or Site 13 (refer to Table 3-8).

Table 3-8 Potential offsets for *Prostanthera cineolifera*

Site	Offset value	Occupied habitat (ha)	Habitat quality score	Percentage of offset met
12	Large population of *Prostanthera cineolifera* present surrounding Tabbimoble Creek occurring over 2.5 hectares open to cattle grazing and edge effects.	2.5	8	189%
13	Two subpopulations identified along edges of Tabbimoble Creek with *Prostanthera cineolifera* occurring over approximately 1.2 hectares of high condition habitat with low to moderate weed levels.	1.2	9	95%
TOTAL		**3.7 hectares**		**284%**

3.5 Koala (Coolgardie/Bagotville, Broadwater and Woombah/Iluka)

Offsets required

The SPIR estimated that 375 hectares of primary and secondary 'habitat critical to the survival of Koala' habitat would be cleared throughout the Project footprint. This figure was derived from 160 habitat assessment plots, each 0.1 hectares in size and distributed throughout a similar number of vegetation polygons, in which absence of the required percentage composition (30% and 50%) of primary and secondary Koala food trees was interpreted as absence of primary and secondary Koala habitat within the entire vegetation polygon. This methodology was based on Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC, 2012) Interim Koala referral advice for proponents.

As part of the detailed vegetation surveys conducted across all sections, consultants assigned habitat quality scores (HQS) for all threatened species, including Koalas. The Koala habitat score methodology was in accordance with the EPBC Act's Environmental Offset Policy (October 2012), using the three generic habitat quality categories found in the Offsets Assessment Guide (stocking rate, condition and landscape connectivity).

The area of habitat to be removed that has been assigned a habitat quality score for Koala, as estimated using this method, is larger than the 375 hectares estimated as 'habitat critical to the survival of the Koala' (DSEWPaC 2012) in the SPIR. This is because Roads and Maritime Services decided to take a more

conservative approach to estimating the area of Koala habitat that would be removed as part of the Project. Roads and Maritime have assumed that all Biometric Vegetation Types that nominally contain Koala food tree species (regardless of percentage tree cover) or provide resting or connecting habitat were included in determining habitat quality scores. As such calculations included all possible Koala habitat including tertiary Koala habitat and forms the basis for determining offsets under the EPBC Act Biodiversity Offsets Policy.

The project would directly impact on 884.74 hectares of identified koala habitat in all sections of the project, of which approximately 100 hectares relates to the Koala populations identified in MCoA D4. As reported in the Biodiversity Offset Strategy the populations were geographically defined in relation to the project as follows:

- Woombah/Iluka: project chainages 94200 – 98400, total impact of 22.96 ha;
- Broadwater: project chainages 135500 – 145650, total impact of 37.84 ha;
- Coolgardie/Bagotville: project chainages 146000 – 159600, total impact of 39.23 ha.

Indirect impacts on Koala would be mitigated through connectivity structures, including large underpasses, overland bridges and exclusion fencing, as well as through general mitigation measures including Koala habitat revegetation and weed management. Considering the proposed measures to mitigate indirect impacts on Koala, no additional values have been assigned to the calculator for indirect impacts.

The values and a rationale for the offset measures are provided in Table 3-9.

Table 3-9 Koala – impacts and rationale for offset measures for each Koala population

Attribute	Woombah/Iluka					Broadwater							Coolgardie/Bagotville														
	HQS4	HQS5	HQS6	HQS7	HQS8	HQS3	HQS4	HQS5	HQS6	HQS7	HQS8	HQS9	HQS3	HQS4	HQS5			HQS6	HQS7			HQS8	HQS9			HQS10	
IMPACT AREA																											
Area (ha)	0.06	5.38 +0.06	3.45	11.44	2.63	14.04	15.56	2.24	0.44	0.17	2.04	3.35	2.45	2.59	10.78			7.47	6.07			2.30	1.51			6.06	
Start quality	4	5	6	7	8	3	4	5	6	7	8	9	3	4	5			6	7			8	9			10	
OFFSET AREA																											
Time over which loss is averted		20	20	20	20	20	20	20	20	20	20	20	20	20	20			20	20			20	20			20	
Time until ecological benefit (years)		2	2	2	2	2	2	2	2	2	2	2	2	2	2			2	2			2	2			2	
Area (ha)	False add to HQS 5	23.6	23.6	172.4	172.4	17.3	28.6	6.1	1.2	1.1	7.3	29.1	6.45	5.5	9.1	6.0	9.7	15.8	2.2	4.7	14.5	2.2	1.8	2.8	1.4	9.2	14.5
Proposed offset site number		13 50% of HQS7 allocated to each HQS		13 50% of HQS8 allocated to each HQS		35	35	33 36	36	36	35	35	21	19	30	29 32	30	17	19 24	19	32	32	29	32	29	29 30	30 31 32
Start quality		7	7	8	8	6	4	6	5	9	10	9	3	3	6	7	8	8	6	7		8	8	9	10	9	10
Risk of loss (%) without offset		20	20	20	20	20	20	20	20	20	20	20	20	20	20			20	20			20	20			20	
Future quality without offset		6	6	7	7	5	3	5	4	8	9	8	2	2	5	6	7	7	5	6		7	6	7	9	8	9
Risk of loss (%) with offset		2	2	2	2	2	2	2	2	2	2	2	2	2	2			2	2			2	2			2	
Future quality with offset		8	8	9	9	7	5	7	6	10	10	9	4	4	7	8	9	9	7	8		9	9	10	10	1	10
Confidence in result (%)		90	90	90	90	90	90	90	90	90	90	90	90	90	90			90	90			90	90			90	
% of impact offset		233	30 6	610	23 23	104	102	137	107	276	102	289	180	109	123			100	125			107	123			100	

Attribute	Rationale
IMPACT AREA	
Area (ha)	This is the area of habitat impacted by the project including primary, secondary and tertiary habitat.
Start quality	This includes areas of habitat within each habitat quality score category (scale of 0-10)
OFFSET AREA	
Time over which loss is averted (max. 20 years)	This describes the timeframe over which changes to the in the level of risk to a proposed offset site can be considered and quantified. This value is capped at 20 years or the life of an offset whichever is shorter. Considering the offset is proposed to be established in perpetuity, the maximum risk-related time horizon was assigned.
Time until ecological benefit (years)	An offset area supporting primary and secondary habitat for Koala would potentially require minimal management measures for habitat qualities to be present for Koala, considering the presence of feed tree species. Therefore a period of 2 years from the impact has been assigned to secure an offset with the required habitat and determine appropriate management actions.
Area (ha)	The specified areas of suitable habitat on the proposed offset properties.
Start quality (scale of 0-10)	This is the habitat quality of the area of offset which is based on the presence of primary, secondary and tertiary habitat, site context factors including habitat connectivity, the likelihood of a resident Koala population being present and habitat disturbances. A conservative approach to the habitat quality scores on the offset properties has been implemented to take into account future indirect impacts from the project.
Risk of loss (%) without offset	Considering the existing threats to areas of habitat on private property are likely to include weed invasion, forestry, livestock, feral fauna species, ongoing clearing and underscrubbing for development and/or other activities such as agriculture/hobby farming, a risk of loss without the offset has been identified as 20%.
Future quality without offset (scale of 0-10)	Considering the existing threats to areas of habitat on private property, the future quality has been reduced by a single point from the start quality.
Risk of loss (%) with offset	Considering an offset site would remove the majority of threat to potential habitat for Koala (ie removal of feed tree species) a residual risk of 2% has been assigned
Future quality with offset (scale of 0-10)	It is envisaged with the implementation of management and restoration measures the future quality of the offset would be increased above existing levels. In particular, facilitating the restoration of feed trees on cleared and modified land with higher fertility soils would result in a substantial increase in the future quality of an offset area.
Confidence in result (%)	There is a high confidence of a potential offset providing an improved outcome for Koala provided adequate restoration, monitoring and management actions are implemented.
% of impact offset	This scenario would provide for greater than 100% of the required offset for the Iluka Woombah/Iluka population, the Coolgardie/Bagotville population and the Broadwater population.
Other measures (up to 10%)	There is potential to provide up to 10% of the offset as other measures. This may include planting of feed trees and/or contributions towards research of Koala. As an indirect offset for the project Roads and Maritime plan to rehabilitate 130 hectares of Koala habitat within the Coolgardie/Bagotville population, which will be protected under a conservation agreement.

Offsets achieved

Additional offset sites have been identified in Update 3 for the Broadwater Koala population and the remaining offset requirements for the Coolgardie/Bagotville population. A total of 17 suitable offset properties have been identified across the three target Koala populations comprising two within the Woombah/Iluka population, four within the Broadwater population and 11 within the Coolgardie/Bagotville Koala population distributions. The impacts and potential offsets for each Koala population identified in MCoA D4 are specified below for each habitat quality score in Table 3-10. As can be seen in Table 3-10 greater than 100 per cent of the offset requirement can be achieved for each Koala population identified in MCoA D4.

The Update 2 properties within the Woombah/Iluka and Coolgardie/Bagotville Koala population distributions are adjoining or in close proximity to the project. Therefore a conservative approach to the habitat quality scores on the Update 2 properties has been implemented to take into account future indirect impacts from the project. For the Update 2 properties high condition primary Koala habitat has been classed as HQS 8, high condition secondary habitat and moderate condition areas of primary habitat are classed as HQS 7, moderate condition areas of secondary habitat are classed as HQS 6 and areas of tertiary habitat have been classed as HQS 3. An area to be placed under a conservation agreement has been identified since Update 2 for Sites 17, 22, 23 and 24 and the areas of Koala habitat on the Update 2 sites for the Coolgardie/Bagotville population have changed and the calculations have been adjusted accordingly.

As part of the Update 3 biodiversity surveys, areas of high quality Koala habitat (HQS 8 and above) were targeted for the remaining offset requirements for the Coolgardie/Bagotville and the Broadwater Koala populations. Suitable feed tree species were observed on the majority of the Update 3 offset sites in addition to direct evidence of the Broadwater and Coolgardie/Bagotville Koala populations utilising the habitat resources on these offset sites.

The presence of a resident Koala population on the Update 3 properties and surrounding areas at Wardell has been identified as part of the Ballina Koala Plan (Niche 2016) and recent biodiversity surveys of these offset properties, including associated habitat quality values, activity levels and movement corridors. The approach for HQS for the Update 3 properties at Wardell takes into consideration these habitat values as well as existing threats to the population and the potential for further habitat degradation impacting the population, the proposed management actions to be provided under a conservation agreement, the potential for security of known movement corridors and the HQS identified for each habitat type in the impact area to provide consistency between comparable habitat types on the offset properties. The Update 3 properties will also complement mitigation measures proposed as part of the project as detailed in the Ballina Koala Plan (Niche 2016) including crossing structures, fencing and rehabilitation of Koala habitat.

The approach for HQS for the Broadwater population takes into account the presence of an active population confirmed during the offset site surveys, limited impacts to connectivity from the project west of Site 33, 34 and 35 and areas of higher quality habitat are around 400 metres from the project impacts. There will be greater impacts to connectivity at Site 36 which is west of the project and the HQS for areas of high quality habitat on this site has been reduced to account for this impact.

For the Update 3 properties areas of habitat supporting high to moderate abundances of primary feed tree species were classed as HQS 10 if in high condition and HQS 9 if in moderate condition. Areas with low-moderate abundance of primary feed trees were classed as HQS 8. Areas supporting high to moderate abundances of secondary feed tree species were classed as HQS 8 if in high condition and HQS 7 if in moderate condition. Areas supporting a low abundance of feed tree species within areas utilised by Koala for dispersal or foraging were classed as HQS 6, areas of regenerating feed trees were classed as HQS 5, areas with no feed trees which provide dispersal and shelter values only were classed as HQS 4 and areas with limited shelter or corridor value such as heathlands and more isolated patches were classed as HQS 3.

The approach for HQS for the Update 3 properties is also consistent with the EPBC Act Referral Guidelines for koala (DoE 2014) with recent evidence of an active population, presence of a range of feed tree species, connectivity to large contiguous areas of habitat (>1,000 ha), little or no evidence of koala mortality from vehicle strikes or dog attacks and these sites are considered important for achieving the interim recovery objectives.

Table 3-10 Impacts and potential offsets for Koala populations identified in MCoA D4 (coloured shading indicates where HQS impacted correspond to values on proposed offset properties; grey shading indicates surplus areas of habitat on offset properties not currently included in calculations)

Koala Population	HQS	Impact Area (ha)	% of offset Update 2	% of offset Update 3	Koala habitat on Update 2 offset properties (ha)									Koala habitat on Update 3 offset properties (ha)							
					12	13	17	19	20	21	22	23	24	29	30	31	32	33	34	35	36
Iluka/ Woombah	3	0				124.1															
	4	0.06	233%	233%																	
	5	5.38																			
	6	3.45	306%	306%	2.8																
	7	11.44	610%	610%	101.9	47.3															
	8	2.63	2323%	2323%		344.8															
	Total	**22.96**			**126.8**	**516.2**															
Broadwater	3	14.04	0%	104%																16.4	1.5
	4	15.56	0%	102%														10.8	5.4	28.6	3.5
	5	2.24	0%	137%																	1.2
	6	0.44	0%	107%														2.7		17.3	3.4
	7	0.17	0%	276%																	
	8	2.04	0%	102%																	
	9	3.35	0%	289%																29.1	1.1
	10	0.00																		7.3	
	Total	**37.84**																**13.5**	**5.4**	**98.7**	**10.2**
Coolgardie/ Bagotville	3	2.45	180%	180%			12.6	6.45	18.3	5.5	23.3	16.1	15.3								
	4	2.59	109%	109%										1.4	0.6	1.0					
	5	10.78	0%	123%																	
	6	7.47	100%	100%				0.6					1.6		9.1	0.2	1.6				
	7	6.07	43%	125%			1.1	4.7					3.9	4.0			2.0				
	8	2.30	73%	107%			15.8							1.8	9.7	12.3	2.2				
	9	1.51	0%	123%										7.3	1.9		2.8				
	10	6.06	0%	100%										1.4	2	5.6	6.9				
	Total	**39.23**					**29.5**	**11.8**	**18.3**	**5.5**	**23.3**	**16.1**	**20.8**	**15.9**	**23.3**	**19.1**	**15.4**				

A proportion of the offset required for the Coolgardie/Bagotville population is provided by the Update 2 sites in Section 10 (refer to Table 3-10). The remaining offset requirements can be adequately achieved on the Update 3 offset properties (refer to Table 3-10). The local Koala population has been further investigated and activity levels mapped throughout the local area as part of the project (Niche 2016; Phillips *et al.* 2015). In addition to Koala activity recorded in areas surrounding the Update 3 offset properties (Phillips et al. 2015), direct evidence of the Coolgardie/Bagotville Koala population has recently been recorded within the offset areas including two individuals and numerous Koala scats beneath feed tree species. The largest areas of high quality Koala habitat (HQS 8-10) were identified on Site 17 and Update 3 sites (Sites 29-32). Habitat quality scores on some of the properties with tertiary habitat only (Site 20, 23 and 34) are generally not sufficient to offset the higher quality areas in the impact area and therefore have been excluded from the calculations for higher quality areas. A Roads and Maritime commitment to revegetate 130 hectares of cleared land with primary and secondary Koala food trees in the Coolgardie/Wardell area including cleared areas of the Update 3 offset properties will also provide an indirect offset for this population.

The Update 3 offset properties at Broadwater achieve greater than 100 per cent of the offset requirements for this population. In particular Site 35 provides a range of habitats (forest, low woodland, shrubland) dominated by primary feed tree species with habitat quality scores of 9 and 10. Evidence of the Broadwater Koala population included an individual male observed on the site and Koala scats were found throughout a portion of the suitable habitat. Substantial areas of tertiary habitat dominated by Broad-leaved Paperbark are also present which provide refuge and dispersal values for the population.

Far greater than 100 per cent of the offset requirement for the impacts to the Iluka/Woombah Koala population can be offset through the high quality (primary and secondary) Koala habitats on Site 13 (refer to Table 3.10).

3.6 Biodiversity offsets summary

3.6.1 Priority Matters of National Environmental Significance

The offset values provided by the proposed offset properties are summarised below in Table 3-11 for each of the priority MNES.

Table 3-11 Summary of offset adequacy for priority Matters of National Environmental Significance

<table>
<tr><th>Priority MNES</th><th>Summary of offset</th></tr>
<tr><td>Lowland Rainforest</td><td>The area required to meet greater than 100 per cent of the offset for Lowland Rainforest of Subtropical Australia (LRSA) can be achieved on the proposed offset properties. This is based on the presence of a total of around 49.2 hectares of high condition LRSA (HQS 9) in the proposed conservation area on Sites 17, 22, 23 and 24 as detailed below.
<table>
<tr><th>Site</th><th>Area of LRSA (HQS 9)</th><th>Adequacy of offset</th></tr>
<tr><td>17</td><td>11.3 ha</td><td>56% of HQS 9 (1.7 ha)</td></tr>
<tr><td>22</td><td>18.3 ha</td><td>91% of HQS 9 (1.7 ha)</td></tr>
<tr><td>23</td><td>14.3 ha</td><td>130% of HQS 8 (1.05 ha)</td></tr>
<tr><td>24</td><td>5.3 ha</td><td>115% of HQS 7 (0.5 ha)</td></tr>
<tr><td>TOTAL</td><td>49.2 ha</td><td>Around 149% of total impact to LRSA (3.25 ha)</td></tr>
</table>
Other measures will also be implemented for the recovery of the community including habitat restoration and translocation of impacted rainforest plants.</td></tr>
</table>

<table>
<tr><th>Priority MNES</th><th>Summary of offset</th></tr>
<tr><td>Moonee Quassia (Quassia sp. Moonee Creek)</td><td>According to the calculator, the populations in the proposed offset covenants on Sites 2, 3 and 25 would provide up to 171 per cent of the required offset as detailed below.
<table>
<tr><th>Site</th><th>Number of stems on offset</th><th>Adequacy of offset</th></tr>
<tr><td>2</td><td>405 stems</td><td>27.3%</td></tr>
<tr><td>3</td><td>1308 stems</td><td>88.40%</td></tr>
<tr><td>25</td><td>817 stems</td><td>55.3%</td></tr>
<tr><td>TOTAL</td><td>2530 stems</td><td>171%</td></tr>
</table>
Other measures will also be implemented for the species recovery including translocation of potentially impacted plants.</td></tr>
<tr><td>Rough-barked Sandstone Apple (Angophora robur)</td><td>Occupied habitat was identified on seven potential offset sites together comprising up to 708.8 hectares, of which 501.4 hectares across three properties with proposed conservation covenants (Site 2, 3 and 25) have been identified to achieve greater than 100% of the required offset as detailed below.
<table>
<tr><th>Site</th><th>Occupied habitat</th><th>Adequacy of offset</th></tr>
<tr><td>2</td><td>70.4 ha</td><td>105% of HQS 8 (14.61 ha)
314% of HQS 7 (1.26 ha)</td></tr>
<tr><td>3</td><td>65 ha</td><td>164% of HQS9 (8.48 ha)
115% of HQS 7 (1.26 ha)</td></tr>
<tr><td>25</td><td>366 ha</td><td>109% of HQS 10 (67.29 ha)
181% of HQS 7 (1.26 ha)</td></tr>
<tr><td>TOTAL</td><td>501.4 ha</td><td></td></tr>
<tr><td>4, 9, 10, 26</td><td>207.4 ha</td><td>Residual area of habitat on offset properties not included in calculations</td></tr>
</table></td></tr>
<tr><td>Singleton Mint Bush (Prostanthera cineolifera)</td><td>Greater than 90% of the offset requirements for Prostanthera cineolifera can be achieved on Site 12 or Site 13 as detailed below.
<table>
<tr><th>Site</th><th>Occupied habitat</th><th>Adequacy of offset</th></tr>
<tr><td>12</td><td>2.5 ha</td><td>189%</td></tr>
<tr><td>13</td><td>1.2 ha</td><td>95%</td></tr>
<tr><td>TOTAL</td><td>3.7 ha</td><td>284%</td></tr>
</table>
Other measures will also be implemented for the species recovery including translocation of potentially impacted plants. There is potential for substantial translocations into disturbed areas of potential habitat within the existing road boundary.</td></tr>
<tr><td>Koala – Iluka/Woombah population</td><td>Greater than 100 per cent of the offset requirement can be achieved for the Woombah/Iluka Koala population from a proportion of the primary and secondary habitat on Site 13 as detailed in Table 3-10.
All of Site 12 and tertiary habitat on Site 13 have been excluded from the calculations (refer to Table 3-10) due to the large offset area available for the Woombah/Iluka Koala population. These surplus areas have been included in the overall koala offset for the entire project as detailed in Appendix B.</td></tr>
<tr><td>Koala – Broadwater population</td><td>The Update 3 offset properties at Broadwater achieve greater than 100 per cent of the offset requirements for this population. In particular Site 35 provides a range of habitats (forest, low woodland, shrubland) dominated by primary feed tree species with habitat quality scores of 9 and 10. Evidence of the Broadwater Koala population included an individual male observed</td></tr>
</table>

Priority MNES	Summary of offset
	on the site and Koala scats were found throughout a portion of the suitable habitat. Substantial areas of tertiary habitat dominated by Broad-leaved Paperbark are also present which provide refuge and dispersal values for the population. Habitat quality scores on Site 34 are not sufficient to offset the higher quality impact areas and therefore have been excluded from the calculations for higher quality areas.
Koala – Coolgardie/Bagotville population	A proportion of the offset required for the Coolgardie/Bagotville population is provided by the Update 2 sites in Section 10 and the Update 3 sites adequately achieve the remaining offset requirements for the Coolgardie/Bagotville population as detailed as detailed in Table 3-10. Eleven suitable offset properties (Sites 17, 19, 20, 21, 22, 23, 24, 29, 30, 31 and 32) have been identified within the Coolgardie/Bagotville Koala population. In addition to Koala activity recorded in areas surrounding the Update 3 offset properties (Phillips et al. 2015), direct evidence of the Coolgardie/Bagotville Koala population has recently been recorded within the offset areas including two individuals and numerous Koala scats beneath feed tree species. The largest areas of high quality Koala habitat (HQS 8-10) were identified on Site 17 and Update 3 sites (Sites 29-32). Habitat quality scores on some of the properties with tertiary habitat only (Site 20, 22 and 23) are generally not sufficient to offset the higher quality areas in the impact area and therefore have been excluded from the calculations for higher quality areas. A Roads and Maritime commitment to revegetate 130 hectares of cleared land with primary and secondary Koala food trees in the Coolgardie/Wardell area provides an indirect offset for this population.

3.6.2 Non-priority threatened species, populations and ecological communities

The proposed offset properties also provide habitat for a range of non-priority threatened species, populations and ecological communities. The area of each biometric vegetation type directly impacted by the project is required to be offset at a ratio of 4:1. The proposed offset properties achieve the required offset ratio (4:1) for 12 of the 32 impacted biometric vegetation types and partially meet the offset ratio for a further 16 impacted biometric vegetation types as indicated in Appendix A. Considering the relatively broad-scale nature of the biometric vegetation types database for the Northern Rivers and subjectivity involved with classifying vegetation into biometric vegetation types, equivalent biometric vegetation types with similar floristic and landscape attributes have been included in the calculations as indicated in Appendix A.

Federally listed protected matters impacted by the project have been identified in the Conditions of Approval by DoE. These species are listed in Appendix B along with the area or number of individuals on each offset property. Indicative offset requirements for each protected matter are based on calculations undertaken for the EIS which are compared against the area of habitat/individuals offset. The proposed offset properties provide sufficient habitats for 13 of the 14 protected matters listed in the Conditions of Approval that are impacted by the project.

State-listed threatened species, populations and ecological communities significantly impacted by the project are listed in Appendix C along with the area of suitable habitat, occupied habitat or number of individuals identified for each of the offset properties.

Additional threatened biodiversity recorded during the Update 3 surveys include *Oberonia titania,* Wallum Froglet (*Crinia tinnula*) and several threatened ecological communities.

4. Delivery of offsets

This section summarises the actions that will be undertaken to deliver the offset sites, including current proposed conservation areas on offset properties, other potential conservation mechanisms, future survey and assessment requirements and an indicative timeframe for the delivery of the offset.

None of the offset properties identified to offset the priority MNES are being used for the purposes of a biodiversity offset for other Roads and Maritime projects. Portions of two of the remaining Update 2 properties are planned to be used to offset two Pacific Highway upgrade projects. The majority of the habitat on the Site 16 property is being utilised for the Devils Pulpit Pacific Highway upgrade apart from 22.6 hectares of the riparian forest surrounding Bungawalbin Creek which is planned to be utilised for the W2B project. Site 28 is offsetting the requirements for the Glenugie Pacific Highway upgrade, with residual areas planned to be utilised for the W2B project.

4.1 Private Conservation Agreements

The full suite of offset mechanisms available to Roads and Maritime is outlined in Section 7 of the Biodiversity Offset Strategy. The majority of sites identified in Update 2 and Update 3 will be placed under a BioBanking Agreement, with the exception of Site 16 which is likely to be transferred to the National Parks and Wildlife Service.

Thirteen of the Update 2 properties (Sites 2, 3, 9, 10, 12, 13, 17, 19, 21, 22, 23, 24 and 25) currently have proposed conservation agreements developed, including identification of a conservation area and a proposed works program (refer to property reports for these sites in Appendix E). Draft conservation agreements have also been identified for seven of the Update 3 properties (29, 30, 31, 32, 33, 35 and 36). Conservation agreements are proposed to be entered into over the majority of the habitats on each property to conserve the proposed conservation area in perpetuity. The conservation agreement will be registered on the property title and is binding on successors in title. Roads and Maritime will enter into BioBanking Agreements under the NSW *Threatened Species Conservation Act 1995* on properties owned by Roads and Maritime or assist private landholders to enter into a BioBanking Agreement across a portion of their land as indicated in the proposed conservation agreements. A summary of the key elements of conservation mechanisms likely to be used for the project are provided below in Table 4-1.

Table 4-1 A summary of the key elements of the conservation mechanisms for the project

Offset requirement	BioBanking Agreement	*National Park*
Protection	In-perpetuity under *NSW Threatened Species Conservation Act 1995.*	*In-perpetuity under National Parks and Wildlife Act 1975.*
Management actions funded	In-perpetuity via the BioBanking Trust Fund. Payments are made annually to landowners.	*In-perpetuity by National Parks and Wildlife Service* (NPWS), *with initial 20 year contribution by Roads and Maritime.*
Monitoring	Office of the Environment and Heritage as specified in individual BioBanking Agreements.	NPWS, *as specified in the plan of management.*
Compliance and enforcement.	Office of the Environment and Heritage as outlined n the BioBanking Compliance Assurance Strategy.	NPWS, *enforcement penalties as per Section 156A of the National Parks and Wildlife Act 1974.*

A site specific property management plan is prepared to accompany the Conservation Agreement. The Property Management Plan outlines the management strategies that must be applied at the site. The plan includes the conditions the land owner must observe in accordance with the BioBanking Agreement and strategies to assist landholders to maintain and improve biodiversity values. The Property Management Plan is designed to complement existing environmental legislation, which continues to apply to the land.

Management actions required to maintain and enhance the habitat for offsets were identified during the field surveys and are detailed in the Biodiversity Offsets Assessment reports (refer to Appendix E). A works program is developed to implement these activities and will be funded by Roads and Maritime via annual in-perpetuity payments from the BioBanking Trust Fund.

4.2 Future survey and assessment

The properties presented in this report and the information contained herein are presented for review as part of the consultation process with the Department of the Environment in addition to the NSW Office of Environment and Heritage and Department of Primary Industries (Fisheries) prior to final approval. Upon approval of the offsets achieved the Roads and Maritime would engage in property negotiations aimed at achieving 100 per cent of the offsets required.

The shortfalls in offset requirements identified in Update 3 for state-listed and non-priority federal-listed species will be addressed through the identification of further offset properties and detailed survey and assessment undertaken to identify biodiversity values. Some of the properties identified in Update 1 may be subject to further survey and assessment where required.

4.3 Timing

Detailed assessments have been completed for 26 offset properties including the eight Update 3 properties, and 18 of the 27 properties identified during Update 1 and 2 to meet the offsets requirements for high priority species (Moonee Quassia and Sandstone Rough-barked Apple) impacted by the early stages of construction (Section 1, Section 2 and soft-soil works) along with Singleton Mintbush and the Woombah/Iluka koala population. Update 3 includes an additional eight offset properties and draft conservation agreements for securing the remaining offset requirements for the Broadwater and Coolgardie/Bagotville koala populations and further detail on the conservation agreements proposed for the four Lowland Rainforest offset sites. Separate biodiversity offset assessments are provided in Appendix E for each of the 26 properties that are the subject of this Update 3 report.

The shortfalls in offset requirements identified in Update 3 for state-listed and non-priority federal-listed species (refer to Appendix A to C), will be addressed as part of the Biodiversity Offset Package through the identification of further offset properties and detailed survey and assessment. The Biodiversity Offset Package is due to be finalised in January 2018, 24 months after approval of the Biodiversity Offset Strategy.

Biodiversity Offset Implementation reports will be submitted twice annually or as agreed with DP&E until the Biodiversity Offset Package is finalised. If there are any changes to the estimated impacts on priority species listed in MCoA D4 or significant modifications are made to any Update 3 offset sites (for example a private landowner withdraws), an Update 4 to the Threatened Biodiversity Offset Status Report showing how any shortfalls to priority species are being addressed, will be submitted for approval.

5. Conclusions

This report summarises the offset requirements for each of the priority MNES as documented in the EIS and identifies how the proposed offset properties achieve these offsets. Detailed information on the population size and distribution of ecological values is documented in individual property reports (refer to Appendix E), and the intent of the status report is to provide a summary of these outcomes. It is evident from the site surveys that the list of potential offset areas investigated by Roads and Maritime will adequately meet 100 per cent or greater of their offset requirements for all of high priority MNES listed in Condition D4 of the MCoA. The majority of these offset properties have draft conservation agreements and Roads and Maritime are actively negotiating with landholders to secure the offset areas under BioBanking agreements.

The properties presented in this report and the information contained herein are presented for review as part of the consultation process with the Commonwealth Department of the Environment in addition to the NSW Office of Environment and Heritage and Department of Primary Industries (Fisheries) prior to final approval. Detailed assessments have been completed for 26 properties to meet offsets requirements for threatened communities and high priority species. Of these 26 properties, 21 of these (refer to Table 5-1) currently have proposed conservation areas developed in consultation with the landowners and a proposed works program (refer to property reports in Appendix E). These properties meet the offset requirements for Lowland Rainforest (Sites 17, 22, 23 and 24), Moonee Quassia (Sites 2, 3 and 25), Sandstone Rough-barked Apple (Sites 2, 3 and 25), Singleton Mint Bush (Sites 12 and 13), the Iluka/Woombah Koala population (Sites 12 and 13), the Coolgardie/Bagotville Koala population (Sites 17, 19, 21, 22, 23, 24, 29, 30, 31 and 32) and the Broadwater Koala population (Sites 33, 34, 35 and 36).

Table 5-1 Potential offset sites subject to biodiversity offset assessments

Site ID.	Tenure	Area (approx. ha)	Investigation Status	Proposed covenant area (approx. ha)
2	Private	363	Proposed covenant established	233
3	Private	339		250
4	Private	116	Update 2 detailed targeted surveys only	
9	Private	68	Proposed covenant established	53
10	Private	409		394
12	Private	160		106
13	Private	585		517
14	RMS	22	Update 2 detailed targeted surveys	
16	RMS	23	Update 2 detailed assessment complete – proposed to be transferred to National Park estate	
17	Private	61	Proposed covenant established	32
19	RMS	36	Update 2 detailed targeted surveys	
20	RMS	52		
21	RMS	28		
22	RMS	72	Proposed covenant established	30
23	Private	25		19
24	RMS	31		26
25	RMS	426		395
26	Private	16	Properties identified in Update 2 with detailed targeted surveys undertaken	
29	Private	55	Additional properties identified in Update 3 with detailed targeted surveys undertaken in April/March 2016 and proposed covenants established.	16
30	Private	63		29
31	Private	19		19
32	RMS	47		20

Site ID.	Tenure	Area (approx. ha)	Investigation Status	Proposed covenant area (approx. ha)
33	RMS	15		13
34	RMS	23		14
35	Private	104		99
36	Private	107		17

The shortfalls in offset requirements identified in Update 3 for state-listed and non-priority federal-listed species (refer to Appendix A to C), will be addressed as part of the Biodiversity Offset Package through the identification of further offset properties and detailed survey and assessment. The Biodiversity Offset Package is due to be finalised in January 2018, 24 months after approval of the Biodiversity Offset Strategy.

The status of addressing Condition D4 and reference to appropriate section is summarised below in Table 5-1.

Table 5-1 Status of addressing Condition D4

Condition	Status	Reference
D4(a) *(i) Koala populations in Coolgardie/Bagotville, Broadwater and Woombah/Iluka;* *(ii) Moonee Quassia (Quassia sp. Moonee Creek);* *(iii) Sandstone Rough–Barked Apple (Angophora robur);* *(iv) Singleton Mint Bush (Prostanthera cineolifera); and* *(v) Lowland Rainforest in Sub-tropical Australia;*	Greater than 100% of the required offsets have been identified across the identified offset properties for the five identified MNES.	Section 3 Summary provided in Table 3-11
D4(b) a map that defines the locations and boundaries of the sites;	Maps have been provided of the 26 proposed offset properties including 21 with proposed conservation agreement areas	Refer to Figure 1-1 and separate property reports in Appendix E.
D4(c) demonstration, through ground truthing survey or an alternative method(s), the adequacy of the site(s), in terms of habitat suitability and presence of the relevant species, to offset the impacts of the SSI;	Targeted surveys and habitat quality assessments have been undertaken on the proposed offset properties for the five priority MNES. As part of Update 3, eight additional offset sites have been identified to achieve the required offsets for the Broadwater and Coolgardie/Bagotville Koala populations.	Refer to separate property reports in Appendix E.
D4(d) *consideration of how the offsets achieve the outcomes required by the Environment Protection and Biodiversity Conservation Act 1999 Environmental Offsets Policy to the satisfaction of DoE; and*	The proposed offsets have been assessed against the outcomes of the EPBC Act offset assessment. Greater than 100% of the required offsets have been identified across the identified offset properties for the five identified MNES.	Refer to Section 3.
D4(e) details of how the offset sites would be secured and managed in perpetuity.	All Update 2 properties, with the exception of Site 16 (NPWS transfer proposed) are suitable for a Conservation Agreement (conservation covenant) to be entered into over the majority of the property to conserve the proposed covenant in perpetuity.	Refer to Section 4.

References

Aecom (2014) Woolgoolga to Ballina Pacific Highway Upgrade Section 6: Vegetation Surveys. Report prepared for Roads and Maritime Services.

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DoE (2014) EPBC Act Referral Guidelines for the vulnerable koala (combined populations of Queensland, New South Wales and the Australian Capital Territory). Commonwealth of Australia, 2014.

DSEWPaC (2012) Interim Koala referral advice for proponents for proponents. Commonwealth of Australia.

Niche Environment and Heritage (2016) Ballina Koala Plan: Koala Population Viability Analysis of the proposed Pacific Highway Upgrade near Wardell, NSW. Prepared for NSW Roads and Maritime Services, January 2016.

Phillips, S., Brearley, G., and Callaghan, J. (2015). Koala Population Survey - Woolgoolga to Ballina Pacific Highway Upgrade: Section 10 (Wardell to Coolgardie), Final report to Roads and Maritime, Biolink Ecological Consultants and Ecosure Pty Ltd.

Woolgoolga to Ballina Planning Alliance (2012) *Upgrading the Pacific Highway Woolgoolga to Ballina Upgrade Environmental Impact Assessment: Working paper: Biodiversity Assessment.* November 2012

Appendix A. Summary of biometric vegetation types on offset properties

Biometric vegetation types *	Area of equivalent biometric vegetation type (ha)																										TOTAL	Impact Area	Offset required (4:1)	Offset status
	2	3	4	9	10	12	13	14	16	17	19	20	21	22	23	24	25	26	28	29	30	31	32	33	34	35	36				
Angophora paludosa shrubby forest and woodland on sandstones or sands of the North Coast																												0.0	0.6	2.4	-2.4
Angophora robur shrubby forest and woodland on sandstones of the North Coast																													7.4		
Tallowwood Dry Grassy Forest of the Far Northern Ranges of the North Coast				49.7																								49.7	1.4	35.2	14.5
Black Bean - Weeping Lilly Pilly Riparian Rainforest of the North Coast																															
Black Booyong - Rosewood - Yellow Carabeen subtropical rainforest of the North Coast	3.7																											3.7	1.0	4.0	-0.3
Blackbutt - Bloodwood Dry Heathy Open Forest on Sandstones of the Northern North Coast																															
Blackbutt - Turpentine dry heathy open forest on sandstones of the lower Clarence of the North Coast	15.3																7.4														
Spotted Gum - Blackbutt open forest of the lower Clarence Valley of the North Coast	53.4		9.5														17.6														
Needlebark Stringybark - Large-fruited Blackbutt heathy open forest on sandstones of the northern North Coast	50.4																											153.6	82.4	329.6	-176.0
Blackbutt – Tallowwood dry grassy open forest of the central parts North Coast																												0.0	0.5	2.0	-2.0
Blackbutt Grassy Open Forest of the Lower Clarence Valley of the North Coast	48.7		40.3														69.5			4.0		0.7	3.9					167.1	21.8	87.2	79.9
Blackbutt - Pink Bloodwood shrubby open forest of the coastal lowlands of the North Coast																				5.8	9.7	11.7	1.8								
Blackbutt - bloodwood dry heathy open forest on Quaternary sands of the northern North Coast											3.6	1.0				3.4												37.0	5.4	21.6	15.4
Coast Cypress Pine Shrubby Open Forest of the North Coast Bioregion																				1.4	0.6	1.0					1.3	4.3	2.0	8.0	-3.7
Coastal Floodplain Sedgelands, Rushlands, and Forblands							0.8	1.6								0.6		0.9					1.1				0.7	5.7	3.8	15.2	-9.5
Coastal Heath on Sands of the North Coast																										13.3					
Coastal mallee of the North Coast																										7.3					
Wet heathland and shrubland of coastal lowlands of the North Coast											2.0															5.7		28.3	19.9	79.6	-51.3
Flooded Gum - Tallowwood - Brush Box Moist Open Forest of the Coastal Ranges of the North Coast																															
Brush Box tall moist forest of the northern ranges of the North Coast	7.3	10.2	12.8	1.3	1.0							11.4					5.0											49.0	7.1	28.4	20.6
Forest Red Gum - Swamp Box of the Clarence Valley Lowlands of the North Coast						34.8	172.2										8.7	3.5	18.6									237.8	45.6	182.4	55.4
Forest Red Gum grassy open forest of the coastal ranges of the North Coast																								0.6							
Forest Redgum - Pink Bloodwood open forest of the foothills and ranges of the North Coast			22.0																									22.6	15.1	60.4	-37.8
Grey Gum - Grey Ironbark Open Forest of the Clarence Lowlands of the North Coast						43.1	115.5																					158.6	62.7	250.8	-92.2
Mangrove - Grey Mangrove Low Closed Forest of the NSW Coastal Bioregions																												0.0	1.3	5.2	-5.2
Narrow-Leaved Red Gum Woodlands of the Lowlands of the North Coast																			7.5	1.4								8.9	25.8	103.2	-94.3
Narrow-leaved Ironbark dry open forest of the North Coast																												0.0	5.5	22.0	-22.0
Needlebark Stringybark - Red Bloodwood Heathy Woodland on Sandstones of the Lower Clarence of the North Coast		14.6																													
Bailey's Stringybark - Needlebark Stringybark heathy woodland on sandstones of the lower Clarence Valley of the North Coast																	260.1											274.7	17.1	68.4	206.3
Orange Gum (*Eucalyptus bancroftii*) Open Forest of the North Coast							20.2												39.6									59.8	9.3	37.2	22.6
Paperbark Swamp Forest of the Coastal Lowlands of the North Coast							97.8		22.6		2.2				0.4									10.2	5.4	28.4	4.0	171.0	88.7	354.8	-183.8
Pink Bloodwood - Tallowwood moist open forest of the far northern ranges of the North Coast										16.9																		16.9	31.0	124.0	-107.1
Red Mahogany Open Forest of the Coastal Lowlands of the North Coast		10.2			127.7	5.2	16.7																					159.8	37.8	151.2	8.6
Scribbly Gum - Needlebark Stringybark Heathy Open Forest of Coastal Lowlands of the Northern North Coast																			140.6		9.1		1.6					151.3	69.7	278.8	-127.5
Scribbly Gum - Red Bloodwood heathy open forest of the coastal lowlands of the North Coast	31.7	10.0	25.5		33.5		25.5				0.7					3.6		4.2										134.7	35.2	140.8	-6.1
Spotted Gum - Grey Box - Grey Ironbark Dry Open Forest of the Clarence Valley Lowlands of the North Coast																			2.5									2.5	11.3	45.2	-42.7
Spotted Gum - Grey Ironbark - Pink Bloodwood Open Forest of the Clarence Valley Lowlands of the North Coast	13.0		2.3		130.4												11.6		4.1									161.4	143.4	573.6	-412.2
Swamp Box Swamp Forest of the Coastal Lowlands of the North Coast		3.0			1.8	8.2	62.2				3.3	0.3				4.0		1.8										84.6	18.0	72.0	12.6
Swamp Mahogany Swamp Forest of the Coastal Lowlands of the North Coast	6.3	4.4	3.0	1.2	7.2	13.4										1.5	15.2			3.3	3.9	5.6	8.3	2.7		38.8	5.3	120.1	44.3	177.2	-57.1
Swamp Oak Swamp Forest of the Coastal Lowlands of the North Coast																		2.3										2.3	39.1	156.4	-154.1
Tuckeroo - Riberry - Yellow Tulipwood littoral rainforest of the North Coast																1.0										5.3		6.3	0.2	0.8	5.5
Turpentine Moist Open Forest of the Coastal Hills and Ranges of the North Coast					19.6																										
Needlebark Stringybark - Turpentine heathy open forest of the Clarence lowlands of the North Coast		196.0			70.8													0.6										287.0	42.7	170.8	116.2
White Booyong - Fig Subtropical Rainforest of the North Coast										11.3			5.5	23.3	15.7	7.3												63.1	2.9	11.6	51.5
TOTAL	**229.8**	**248.4**	**115.4**	**52.2**	**392.0**	**104.7**	**510.9**	**1.6**	**22.6**	**28.2**	**11.8**	**12.7**	**5.5**	**23.3**	**16.1**	**21.4**	**395.1**	**13.3**	**212.9**	**15.9**	**23.3**	**19.0**	**16.7**	**13.5**	**5.4**	**98.8**	**11.3**	**2621.8**	**900.0**	**3605.7**	**-978.2**
Biometric Vegetation not Impacted by project	**2**	**3**	**4**	**9**	**10**	**12**	**13**	**14**	**16**	**17**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**	**TOTAL**			
Blackbutt - Tallowwood moist ferny open forest of the coastal ranges of the North Coast																		1.1										1.1	0.0	0.0	1.1
Blackbutt - Tallowwood tall moist forest of the far north east of the North Coast												5.58																5.6	0.0	0.0	5.6

*Biometric vegetation types in grey text are equivelant to impacted vegetation types identified iabove in black text.
Grey shading indicates offset target achieved

Appendix B. Non-priority federally-listed threatened species and ecological communities on each offset property (EPBC Act)

Protected matter	Common name	TSC Act	EPBC Act	Area of habitat or number of indivdiuals																											TOTAL	Unit	Indicative offset target
				2	3	4	9	10	12	13	14	16	17	19	20	21	22	23	24	25	26	28	29	30	31	32	33	34	35	36			
Threatened ecological communities																																	
Littoral Rainforest and Coastal Vine Thickets on Eastern Australia		E	CE																1 0										5.0		**6.0**	hectares	3.4
Threatened flora species																																	
Arthraxon hispidus	Hairy Joint-grass	V	V										7 6	7.1	3 5	1.9	0.2	3.9	2 0												**26.2**	hectares	8 9
Cryptocarya foetida	Stinking Cryptocarya	V	V										2 0				71.0	3.0													**76.0**	individuals	70 0
Eucalyptus tetrapleura	Square fruited Ironbark	V	V																			90 0									**90.0**	hectares	129 0
Macadamia tetraphylla	Rough-shelled Bush Nut	V	V								1 0		2 0			9.0	33.0	29 0	32.0												**106.0**	individuals	90 0
Threatened fauna species																																	
Dasyurus maculatus maculatus	Spotted-tail Quoll	E	E	233.1	250.1	115.4	52.9	392.1	104.7	510.0	1 6	22.6	29.8	11 8	18.3	5.5	39.7	17.0	24.1	395.1	14.4	212.9	15 9	23.3	19 0	17.1	13 5	5.4	98 8	10.7	**2654.9**	hectares	2059 0
Lathamus discolor	Swift Parrot	E	E	229.8	250.1	115.4	52.9	392.1	104.7	510.0	0 0	22.6	18.4	11 8	18.3	0.0	14 6	0.4	12 5	395.1	11.2	212.9	14 5	22.7	18 0	16.0	13 5	5.4	74 5	8.7	**2546.1**	hectares	1760 5
Litoria olongburensis	Olongburra Frog	V	V											7.5			2.4		5 5				3.3	3 9	5.6	8.7	10.2		80.2	1.0	**128.4**	hectares	43.4
Mixophyes iteratus	Giant Barred Frog	E	E									22.6																			**22.6**	hectares	18 5
Nannoperca oxleyana	Oxleyan Pygmy Perch	E	E							139 8	1 6																0.2		0.5		**142.1**	hectares	15 8
Phascolarctos cinereus	Koala	V	V	229.8	250.1	115.4	52.9	392.1	104.7	510.0	0 0	22.6	18.4	11 8	18.3	0.0	14 6	0.4	12 5	395.1	11.2	212.9	14 5	22.7	18 0	16.0	13 5	5.4	74 5	8.7	**2546.1**	hectares	2136 8
Phyllodes imperialis	Pink Underwing Moth	E	E														16.6	16 5	9 9												**43.0**	hectares	9.1
Potorous tridactylus tridactylus	Long-nosed Potoroo	V	V												1 0		14.9		12.5			0 0	14 5	22.7	18 0	16.0	13 5		98 8	1.0	**212.9**	hectares	137 0
Pteropus poliocephalus	Grey-headed Flying-fox	V	V	229 8	250.1	115.4	52.9	392.1	104.7	510 0	0 0	22.6	29 8	11.8	18 3	5.5	39.7	17 0	23.4	395.1	13.5	212.9	14 5	22.7	18 0	16.0	13 5	5.4	74 5	8.7	**2618.0**	hectares	2000 5
Xanthomyza phrygia	Regent Honeyeater	E	E	229.8	250.1	115.4	52.9	392.1	104.7	510.0	0 0	22.6	18.4	11 8	18.3	0.0	14 6	0.4	12 5	395.1	11.2	212.9	14 5	22.7	18 0	16.0	13 5	5.4	74 5	8.7	**2546.1**	hectares	1594 0

Grey shading indicates offset target achieved

Appendix C. State-listed threatened species, populations and ecological communities on each offset property (EPBC Act)

Scientifc Name	Common name	TSC Act	Area of suitable habitat (ha)																											TOTAL	Unit
			2	3	4	9	10	12	13	14	16	17	19	20	21	22	23	24	25	26	28	29	30	31	32	33	34	35	36		
Threatened flora species																															
Archidendron hendersonii	White Lace Flower	V														5 0		1 0												**6.0**	individuals
Eleocharis tetraquetra	Square-stemmed Rush																													**0.0**	hectares
Endiandra muelleri subsp. bracteata	Green-leaved Rose Walnut	E										16 0					12 0													**28.0**	individuals
Grevillea quadricuada	Four-tailed Grevillea	V		8 0																										**8.0**	hectares
Lindernia alsinoides	-																		1.0											**1.0**	hectares
Lindsaea incisa	Slender Screw Fern	E					0.1												3.0											**3.1**	hectares
Maundia triglochinoides	-	V					0 2		25.3																					**25.5**	hectares
THREATENED FAUNA SPECIES																															
Petaurus australis	Yellow-bellied Glider	V	229.8	250.1	115.4	52.9	392.1	114.3	510 0		22.6	18.4	9.8	18 3		13.3		12.5	395.1	11 2	212.9	14.5	22.7	18.0	16 0	13.5	5.4	74.5	8.7	**2551.9**	hectares
Petaurus norfolcensis	Squirrel Glider	V	229.8	250.1	115.4	52.9	392.1	114.3	510 0		22.6	18.4	9.8	18 3		13.3		12.5	395.1	11 2	212.9	14.5	22.7	18.0	16 0	13.5	5.4	74.5	8.7	**2551.9**	hectares
Phascogale tapoatafa	Brush-tailed Phascogale	V	229.8	250.1	115.4	52.9	392.1	114.3	510 0			18.4	4.3	17 9		12.1		7 0	395.1	5 9	212.9	14.5	22.7	18.0	16 0	13.5	5.4	74.5	8.7	**2511.6**	hectares
Dromaius novaehollandiae	Coastal Emu	EP	233.1	251.9	115.4	53.0	394.3												395.1	14.4	212.9									**1670.1**	hectares
Nurus atlas	Atlas Rainforest Ground Beetle	V										12 9			5.5	24.7	16 6	9 9												**69.7**	hectares
Tree Roosting Bats																															
Chalinolobus nigrogriseus	Hoary Wattled Bat	V																													
Falsistrellus tasmaniensis	Eastern False Pipistrelle	V																													
Kerivoula papuensis	Golden-tipped Bat	V																													
Mormopterus beccarii	Beccari's Freetail-Bat	V	233.1	251.9	115.4	53.0	394.3	114.3	517 0	1.6	22.6	29 8	11.8	18 3	5.5	39.7	17 0	24.1	395.1	14.4	212.9	15.8	23.3	19.0	17.2	13.5	5.4	98.7	10 8	**2675.4**	hectares
Mormopterus norfolkensis	Eastern Freetail-Bat	V																													
Nyctophilus bifax	Eastern Long-Eared Bat	V																													
Saccolaimus flaviventris	Yellow-bellied Sheathtail-Bat	V																													
Scoteanax rueppellii	Greater Broad-nosed Bat	V																													
Arboreal Snakes																															
Hoplocephalus bitorquatus	Pale-headed Snake	V	229.8	250.1	115.4	52.9	394.3	114.3	510 0		22.6	29 8	11.8	18 3	5.5	39.7	17 0	23.4	395.1	13 5	212.9	15.8	23.3	19.0	16.1	13.5	5.4	74.5	10 8	**2634.8**	hectares
Hoplocephalus stephensii	Stephens' banded snake	V																													
Threatened ecological communities																															
Coastal Cypress Pine Forest		E														0.4						1.4	0 6	1.0					1 3	**4.7**	hectares
Freshwater Wetlands on Coastal Floodplains		E							0.8	1.6								0.7		0 9					1.1				0.7	**5.9**	hectares
Littoral Rainforest		E																1 0										5.3		**6.3**	hectares
Lowland Rainforest		E	3.7									12 9			5.5	24.7	16 6	9 9												**73.4**	hectares
Subtropical Coastal Floodplain Forest on Coastal Floodplains		E		3 0			2.4	43.0	234.4				3.3	0 3				4 0	8.7	5 2		1.4				2.7		38.8	5 2	**352.5**	hectares
Swamp Oak Floodplain Forest on Coastal Floodplains		E																		2 3										**2.3**	hectares
Swamp Sclerophyll Forest on Coastal Floodplains		E	6 3	4.4	3.0	1.2	6.7	13.4	97.8		22.6		2.2			1.1	0.4	1 5	15 2			3.3	3 9	5.6	8 3	10.2	5.4	28.3	4.1	**244.8**	hectares

Appendix D. Responses to comments on the Biodiversity Offsets Status Report

Document		Threatened Biodiversity Offset Status Report Matters of National Environmental Significance	
Version No.		Rev 02 11 December 2014	
Agency Name		Commonwealth Department of Environment	
Date		8 July 2015	
Item	**Condition No/Report Reference**	**Comment**	**RMS Response**
1.		It is suggested that RMS provide a statement that the offsets identified for the Woolgoolga to Ballina project have not been and/or are not being considered to offset or mitigate impacts from any RMS projects.	According to the EPBC Act offset policy, residual areas are permitted to be identified. It is RMS's intention to use residual areas on identified offset sites to meet this requirement of this project.
2.		Biodiversity Status Report – information in this will need to be incorporated into the BOS which should be a stand-alone document for the delegate's consideration of approval, Also, please be advised that there is insufficient/more accurate data on ecological information on proposed offset areas to provide informed comments.	Details of ecological surveys undertaken on each site were included as Appendix E to the BOSR as separate reports. A summary table is provided (Table 3-11) to summarise how each offset property addresses offsetting the outcomes of the EPBC Act offset calculation for each priority species.
3.		In the absence of EPBC offset worksheets and detailed ecological assessment data for each offset site, it is not possible to comment on the appropriateness of the numerical values used in the calculator to arrive at final offset requirements.	RMS to provide EPBC calculator sheets for each MNES and where relevant each offset site identified.
4.		A large number of potential offset properties identifies, in particular, in Wardell area, appear to be located directly adjacent to either side of the highway. What consideration has been given to potential edge effect impacts associated with construction and operation of the highway on these offset sites in calculating the offset values.	Some of the offset properties will be subject to some level of indirect impacts during and following construction of the proposed Pacific Highway upgrades. Proposed mitigation measures will largely limit direct and indirect impacts to the road boundary. The following mitigations are proposed to limit indirect impacts in adjacent habitats: • Retaining vegetated buffers within the road boundary where possible to limit any potential indirect impacts. • Installation of bridges and culverts to maintain natural hydrological regimes and facilitate fauna movement.

			• Installation of dedicated fauna crossing structures such as arboreal crossing structures and dedicated underpasses. • Sedimentation and erosion controls. • Revegetation/landscaping works. • Weed management measures. There is potential for further weed encroachment and exacerbation of existing weed infestations, however weed management measures will be implemented under the proposed covenant and as part of the project. Vegetation condition in the area adjoining the project is often likely to be improved under the management measures of a conservation covenant. These potential indirect impacts have been considered when determining habitat quality scores, particularly for Koala. Potential indirect impacts from the project will also take into consideration when developing works programs for covenant areas. Indirect impacts and connectivity structures relevant to each potential offset property has been discussed in the Biodiversity offset assessment reports for each property (Appendix E).
5.		This report provides offset information only on Woombah/Iluka and Coolgardie/Bagotville Koala populations and does not include the Broadwater Koala population as required by condition D4.	RMS will separate out these 3 populations using the boundaries specified in the Koala Management Plan for assessment of impact. RMS to discuss offsetting options with DoE.
Document		**Threatened Biodiversity Offset Status Report Matters of National Environmental Significance**	
Version No.		**Rev 02 11 December 2014**	
Agency Name		**NSW Department of Planning & Environment**	
Date		**16 July 2015**	
Item	**Condition No/Report Reference**	**Comment**	**RMS Response**
1.	Section 1.2	This report (Update 2) follows the Update 1 offset status report. Is the Update 1 report the Table titled *Status of preliminary EPBC Act offset investigations* in Appendix B of the draft Biodiversity Offset Strategy in Appendix J of the SPIR? The Update 1 table should be updated and appended to the	Update 1 report is provided in the EIS/SPIR Update 1 properties added to Table m1-1 and status of investigations provided. Additional table added (Table 3-11) to summarise how each offset addresses offsetting priority species.

		Update 2 report that is submitted for the Secretary's approval. The table should summarise how the offset sites address the requirements of CoA D4(a)(i) to (v), as relevant. It is noted that several sites in the Update 1 table are not included in the list of sites in Table 1-1 of the Update 2 report.	
2.	Section 2.2	Surveys were carried out on each site to identify and classify the vegetation and assess the vegetation/habitat condition. Targeted surveys of threatened species (flora and fauna) and opportunistic sightings were recorded. It is noted that the assessments carried out in late 2014 of the 19 offset sites noted the following limitations: • Survey timing limited the potential for cryptic and seasonal species being detected; and • Large size of the offset properties and extent of potential habitat – potential for other species that were not identified to be present in parts of the site not covered by the traverses and plot assessment. It is stated that several surveys over different seasons often required to identify the full suite of flora and fauna species that occur over large sites. These limitations should be noted in the report.	Added at section 2.5
3.	Section 3.5 and Table 3-10	An offset of 140.5 hectares of Koala habitat is required for sections 5 to 10. Information on the amount of primary and secondary Koala habitat impacted by the project should be provided. This would inform the type of Koala habitat required to be offset. Table 3-10 should provide details of the proportion of primary/secondary Koala habitat should be provided in the table by offset site.	To make consistent with the BOS habitat quality scores have been applied to the proposed offset based on the same parameters and methodology. These have been added to table 3-10.
4.	Section 4	This section should summarise the actions that would be undertaken to deliver the offset sites, including future assessment and surveys and an indicative timeframe for the	Section 4 modified to include these details

		delivery of the offset.	
5.	Section 4.2	The Biodiversity Offset Strategy would discuss the options for securing and managing offset sites in perpetuity, with Nature Conservation Trust Agreements with private landowner's one method of securing an offset. The report should reference the Biodiversity Offset Strategy and state that it is consistent with the BOS.	Reference to BOS added
6.	Offset Site Assessments	Will the assessments of the 19 sites identified in Table 1-1 be appended to the final Update 2 Report? It is noted that the assessment of site 16 (Bungawalbin) was not provided for review. There are a number of errors in the site assessments and these should be corrected prior to finalisation and submission with the final report.	Yes, included as Appendix E

Document		**Threatened Biodiversity Offset Status Report Matters of National Environmental Significance**	
Version No.		Rev 02 11 December 2014	
Agency Name		NSW Environment Protection Agency	
Date		03 March 2015 provided by Email	
Item	**Condition No/Report Reference**	**Comment**	**RMS Response**
1.		At this point the EPA acknowledges that RMS has demonstrated its commitment to fulfil the requirements of MCoAD4. However the EPA encourages ongoing consultation to discuss offset acquisition with the EPA as required by MCoAD4.	Noted – EPA should be involved in any further offset site selection
2.		The EPA notes the report was prepared to address MCoAD4 which is an EPBC Act requirement. The EPA understands this report was presented to our agency for review as the condition requires consultation with the EPA. The EPA notes that there	Noted – EPA should be involved in any further offset site selection

		has not been any consultation prior to receipt of this report in relation to offset site selection or proposed conservation mechanisms.	
3.		Page 3 – habitat quality was provided for priority MNES species only and does not report condition against impacted state listed threatened species (this reflects the EPBC Act focus). If the project was subject to the NSW Framework for Biodiversity Assessment, Biometric vegetation types could be used as a surrogate for threatened species habitat where ecosystems credits would theoretically be required. Where species credits would be required, targeted habitat attributes and surveys would be required to confirm threatened species presence. However the RMS is obliged to follow MCoAD(5)(f) which directs the RMS to survey and assess the presence of targeted threatened species (impacted by the project). The RMS will therefore need to provide an assessment of the suitability of the site in meeting state listed threatened flora and fauna requirements prior to the EPA providing in principle support.	The presence of habitat for state listed fauna species, and identified threatened flora populations are detailed in Appendix B and C for species that are significantly impacted by the project. Targeted surveys have been undertaken for priority species credit species impacted by the project (Long-nosed Potoroo, Oxleyan Pygmy Perch, Giant Barred Frog) and the results of these will be incorporated into the offset strategy
4.		Ailed in Page 3 – the proposed conservation mechanism in this report is stated as follows "Following agreement with the property owner a Trust Agreement (conservation covenant) will be entered into over the property, or a portion of the property, with the Nature Conservation Trust (NCT) to conserve the offset in perpetuity". This approach is again noted in section 4 - Conclusions. The EPA understood that the agreement was that offset properties would always be offered to NPWS in the first instance before exploring alternative opportunities. While the EPA acknowledges that there may be benefits associated with this approach and, in some instances, this approach may provide the most effective management and protection of an offset site (particularly highly degraded), the EPA's preference is to ensure that the offset strategy facilitates a range of conservation management approaches, which can be tailored based on the specific characteristics of each offset property. The EPA also queries the enforceability of Trust agreement and	Further detail will be provided in the overall biodiversity offset strategy regarding proposed conservation mechanisms

		is not aware of the regulatory tools available to enforce the agreement by the NCT or NSW Land and Environment Court. In addition the EPA also notes that a NCT covenant does not exempt the land from mining or mining exploration as is the case with National Park estate and BioBanking offset sites.	
5.		Page 11 – section 3 - Outcomes of the Offset Assessment. This section of the status report treats the offset requirement for each priority MNES species in isolation. That is, it reports on the inputs and outputs of the EPBC Act offset calculator at an individual property level and provides a summation of the offsets achieved. Therefore it may be a useful tool to assess the adequacy of the proposed offsets in meeting the federal offset obligation (in a purely numerical sense) but it does not provide sufficient strategic level data at a range of scales to address OEH principles for the use of biodiversity offsets in NSW which is required by project approvals in the Biodiversity Offset Strategy. Again the offset strategy will provide the vehicle to move this debate forward.	Further detail will be provided in the overall biodiversity offset strategy regarding the strategic level data to address the OEH principles. Some of this strategic level data is provided in the individual biodiversity offset assessments for each property (ie key habitats and corridors, biodiversity values and management frameworks) as well as details from the EIS/SPIR (ie principles 1-3)
6.		In summary, it appears that the collective offset properties meet the requirements of the EPBC Act offset calculator, however it is not the role of the EPA to provide comment on the inputs into the calculator. The EPA will use the project's Biodiversity Offset Strategy to guide decisions on the appropriateness of proposed offset properties. For example, how the offset contributes to building the public reserve system and CARR targets. The individual property reports also need to provide a landscape scale map to clearly illustrate how the property delivers strategic linkages and corridor enhancement.	Details are provided in the individual biodiversity offset assessments for each property (Section 3.1), stating how the properties fit into the Key habitats and corridors, and climate change corridors identified by OEH. The majority of offset properties occur within identified key habitats and/or corridors, and where this is not the case the properties have been selected based on the presence of high quality habitat (ie presence of Oxleyan Pygmy Perch, aquatic habitats). In addition to the descriptions of strategic linkages/habitats in Section 3.1 of each property report maps are provided.
7.		Point 9 of the OEH principle for the use of biodiversity offsets in NSW does not place value on offsets that are isolated or fragmented. It appears that the majority of proposed offsets are either dissected or adjacent to the new highway. Whilst this may	Further detail is provided in the overall biodiversity offset strategy regarding property relationships to crossing structures To achieve like for like vegetation/habitat types and inclusion of

		not necessarily limit biodiversity potential, it will increase issues such as fragmentation, access, edge effects, connectivity, drainage, increased feral predation, fire risk and frequency, noise impacts and bird strike. The individual property reports do not provide discussion on the relationship of the property with the road or connectivity structures. In some cases it may be beneficial to secure the habitat in the approaches to key fauna crossing structures.	impacted threatened flora populations on offset properties several of the properties adjoining the project have been selected. This also provides for improved biodiversity outcomes in the vicinity of impacted areas of habitat. Much of the detail regarding the biodiversity issues raised are detailed in the EIS/SPIR for the project and will be minimised through the proposed mitigation measures. Where the new highway will adjoin an offset it impacts generally one boundary with relatively extensive areas of habitat that will be remote from the highway and connectivity will be retained on the remaining edges.
8.		As outlined in individual property reports, the EPA notes that "Detailed biodiversity surveys have not been undertaken". The EPA requires these survey results once completed at the appropriate time of year (following project approvals and OEH guidance) and an opportunity to undertake site inspections prior to providing in principle support.	Targeted surveys have been undertaken for priority species which cannot be accurately predicted based on habitat (ie Long-nosed Potoroo, Giant Barred Frog, and Oxleyan Pygmy Perch). The results of these surveys will be incorporated into the individual property reports and overall strategy
9.		Koala offset sites 17, 19, 22, 24 will provide opportunities to improve koala habitat connectivity in section 10. However the EPA has not been involved in the selection of these sites and it is unclear how these provide the most efficient linkages in that section or, indeed, represent the greatest conservation returns for money for koalas. The RMS will need to demonstrate why this proposal represents the most effective outcome for koala passage in section 10.The EPA understands that the majority of these properties are currently made up of cleared land. In addition, the EPA also believes the proposed corridor will be used by the RMS to satisfy MCoAD9(d)(x) and as such is viewed by the EPA as a mitigation measure rather than a biodiversity offset. This discussion would be best placed following guidance from the latent offset strategy and OEH approaches to biodiversity offsetting.	Further detail will be provided in the overall biodiversity offset strategy regarding effective outcomes for koala passage.
10.		It is stated in the individual property reports that the offset	Further detail will be provided in the overall biodiversity offset

		management actions are to be funded for 10 years. However point 9 of the OEH principle for the use of biodiversity offsets in NSW states that offsets will be of greater value where the management for biodiversity is in perpetuity. The EPA anticipates that management funding will be based on implementing and meeting biodiversity management goals prescribed in the offset strategy. Subsequent and ongoing funding will be reduced once these goals are reached (not necessarily 10 years) and will likely be limited to maintenance of biodiversity values. Please note, the EPA is unclear how management of ongoing issues such as feral animal predation and invasive weeds will be accomplished in less than 10 years. These issues will remain in perpetuity and would be managed as such in public reserves.	strategy regarding funding arrangements and ongoing management.
11.		The EPA undertook an inspection of proposed offset site 25 – Mahogany Drive, Pillar Valley. It is apparent that this property is in an outstanding condition, has good connectivity to large tracts of public land, and contains a numbers of threatened species. The EPA agrees with the conclusions reached regarding the suitability of this site as an offset and recommends that it be offered to NPWS as an addition to the NSW National Park estate.	Noted
Document		**Threatened Biodiversity Offset Status Report Matters of National Environmental Significance (Update 2)**	
Version No.		Rev 02 14 August 2015	
Agency Name		Commonwealth Department of Environment	
Date		11 November 2015	
Item	**Condition No/Report Reference**	**Comment**	**RMS Response**
	General	Suggest removing reference to Stages (Stage 2 of BOSR) as this confuses with stages of the highway upgrade and substitute with Update 2.	Agree – 'Stage 2' to be replaced with 'Update 2' through-out report.
	General	Condition D4 does not require the offset properties to be legally secured prior to commencement of construction.	Noted – first sentence amended to indicate that offsets must be identified prior to construction.

	General	Please provide a table listing the condition requirements and cross referencing to the relevant section/s of BOSR where they have been addressed.	Agree – Added Table 1.1 to Section 1.1
	Condition 17 and D4	You may want to consider updating the reference to late 2015 if this is not achievable. Section 1.2 states that remaining MNES as required by condition 17/D4 will be addressed in another BOSR prior to commencement of construction of other sections. Could you please expand on this in relation to D4(a)(i) and D4D4(a) (iv) and (v) – whether these will be addressed in the next stage (update) of BOSR or in several other BOSRs. It is important that this information is presented in the BOSR for the conditional approval of the BOS and BOSR, and any future revisions to BOSR. Please also provide information as to approval from NSW (Secretary\s) to take this approach for the BOSR.	Noted – amend to first quarter 2016. Incorporated into text of Section 1.2, indicating which BOSR update covers which D4 species/communities: Noted, as per the NSW State approval condition D4, the BOSR can be staged in line with the construction timeframe, with submission required prior to when impacts on identified priority species are likely.
		Of the 27 properties initially considered, only 18 have been selected as potential offset sites based on vegetation assessments. Of these only 6 have progressed to consultation with landowners for conservation purposes. For Moonee Quassia, the relevant offset properties which provide >100% of offset has not been provided under section 3.2 For the Singleton mint bush it is unclear whether the offset requirement will be met through offset site 12 or 13, noting that site 12 is not one of the priority sites which has progressed further in regard to a conservation agreement.	Draft conservation agreements have now been developed for 18 properties. The draft conservation agreement for Site 12 will be incorporated into Update 2 for Singleton Mint Bush. The conservation agreements for Sites 17,19, 21, 22, 23 and 24 will be incorporated into Update 3 for Lowland Rainforest and the Coolgardie koala population. No single site provides more than 100% of the offset requirement for Moonee Quassia, so RMS is progressing with all 3 sites (2, 3 and 25) to meet this requirement. The draft conservation agreement for Site 12 has been incorporated into Update 2. It is RMS's intention to secure both Sites 12 and 13 as offset sites, which will meet well over 100% of the Singleton Mint Bush requirements.
		Please explain how the offset areas (in hectares) for MNES species have been calculated based on surveys undertaken	Further detail provided for Angophora robur. The offset areas stated for each MNES represents the area occupied by that

		within offset properties.	MNES
		We note some minor discrepancies in extent of offset areas provided within BOSR and offset calculator guide.	Noted – these will be checked for accuracy.
Document		**Threatened Biodiversity Offset Status Report Matters of National Environmental Significance (Update 2)**	
Version No.		Rev 02 14 August 2015	
Agency Name		NSW Department of Planning and Environment	
Date		28 August 2015	
Item	**Condition No/Report Reference**	**Additional Comments**	**RMS Response**
1	Executive summary	Last paragraph states that RMS will work with landowners to place an in-perpetuity agreement on the land and provide annual funding for required management actions. This statement could be interpreted to mean that RMS will provide annual funding in-perpetuity. It is suggested that RMS will work towards conservation and funding of the land in accordance with the Biodiversity Offset Strategy.	Adopt words as suggested.
3	Section 2.2	<u>Koala</u> The first sentence refers to primary, secondary and supplementary feed tree species. This section then refers to the Koala Recovery Plan classification of koala habitat as primary, secondary and tertiary. These descriptions are used in the Biodiversity Offset Strategy. Should the reference to supplementary feed trees be to tertiary, to be consistent when referring to koala habitat.	The terms used to define feed trees are different to the classification of habitat in literature. Supplementary species also occur in primary and secondary habitat. Additional text inserted to explain distribution of trees relative to habitat quality. Text has also been provided below Table 3-10 to identify the HQS which relates to primary/secondary, tertiary habitat for offset properties.
7	Offset Site Assessment	Section 1.2, 2nd paragraph - Condition D4 is a State condition not Commonwealth – correction to be made to all Biodiversity Offset Assessment reports.	Each assessment report corrected.

Document		**Threatened Biodiversity Offset Status Report Matters of National Environmental Significance (Update 3)**	
Version No.		Rev 03 03 May 2016	
Agency Name		Commonwealth Department of Environment	
Date		20 June 2016	
Item	**Condition No/Report Reference**	**Additional Comments**	**RMS Response**
1	General	Has the offset calculator worksheet been updated for Koala? The most recent documents submitted only contain the offsets calculator for Lowland Rainforest. The Department has received an earlier version of the calculator for koala; however does it cover all sections including 9 and 10? (Current offset calculator worksheet for koala identifies 298 hectares of potential offset habitat, is that correct?).	There were no changes to the EPBC calculator sheets for the priority koala populations that were first submitted on 3 May 2016, re-submitted on 10 June due to file expiry and submitted for approval on 14 June 2016 (refer to emails 3 of 5 and 4 of 5). Calculator sheets for the koala offsets outside of the three priority populations listed in D4 will be provided in the Biodiversity Offset Package. As per Table 3-9, 588.55 ha of proposed offsets have been identified for the 3 priority koala populations. The calculator sheets for the three koala populations have been re-packaged to align better with Tables 3-9 and 3-10 and include sites approved under Update 2 for completion. Three errors and some 'Proposed offset' descriptions have been corrected. Tables 3-9 and 3-10 have been updated accordingly. A new line has also been inserted in Appendix B to show total koala offsets for the entire project.
3	Section 3.5	The plan is unclear on the number of total hectares that will be impacted along the sections 9 and 10. Section 3.5 of the BOSR states that 375 hectares of primary and secondary habitat critical to koalas will be cleared. Assuming this figure also includes Woombah/Iluka? However later in this section of the BOSR it says of the 884.74 total hectares, that 100 hectares relates to koala populations as identified in the MCoA D4 will be impacted.	The BOSR is centred on the agreed population areas for the 3 priority koala populations listed in D4 rather than specific sections. The chainages and impact areas for each priority population were approved in the Biodiversity Offset Strategy and have been included in Section 3.5 for reference. The BOSR reflects these impact areas in the 'Impact area' rows in

		Can you please clarify and provide further details in the BOSR. The BOSR will also need to make clearer reference to surveys that have already been undertaken as part of the assessment process. Either the surveys completed under the MCoA or the survey under the Ballina Koala Plan.	Table 3-9 as follows: Woombah/Iluka: 22.96 ha Broadwater: 37.84 ha Coolgardie/Bagotville: 39.23 ha. The 375 ha refers to primary and secondary koala habitat to be cleared throughout the entire Project footprint (Sections 1-11). As described in Section 3.5, RMS has taken a more conservative approach by including all possible koala habitat across the Project (not just primary and secondary). Thus the impact amount increases to 884.74 ha of total koala habitat across the entire project. For all priority species site specific surveys were conducted by Jacobs as detailed in Chapter 2. These are included in Appendix E of the BOSR. Additional survey data from the Ballina Koala Plan was also used for the assessment of suitable offset sites for the Coolgardie/Bagotville koala population.
4	Table 3-9	This table is a little unclear on the breakup of different habitat quality scores (HQS) for each site. For example there is 9.2 hectares of HQS10 and 14.5 HQS10 for Coolgardie/Bagotville. The row below in the table states that sites 29, 30, 31 and 32 have this amount of hectares with this score. So what is the actual break up for each of those sites? If there is 14.5 hectares of HQS10 for each of the sites 30, 31, 32? Or is that across all sites as a combined figure? (Happy to discuss over the phone if this is unclear)	The actual break up for each site is provided in the following Table 3-10 and is colour coded to show how each site meets the HQS. Grey boxes denote a surplus area that has not been used in the offset calculations for the 3 priority populations (refer to explanation in title of table). These surplus areas will be incorporated into the Biodiversity Offset Package to offset the broader koala requirements. The figures in Table 3-9 are a combined figure of the offset sites listed in the 'Proposed offset site number'.
5	Comments under table 3-10 Under heading 'Offsets Achieved'	The Department requires more justification/explanation on page 32 of the BOSR in relation to how proposed habitat scores were determined. Were the koala referral guidelines considered for this assessment? For the sites that have a HQS of 10, do they meet the criteria for having little to no evidence of koala mortality? Are they close to roads? Do they contain good connectivity? These elements are not mentioned. The BOSR	Further detail regarding assessment of habitat scores has been inserted into the 'Offsets achieved' section for the koala population. Considering the known presence of a population using the sites, the lack of evidence for dog attack and presence and car strike in these areas (not near major roads), connectivity to large areas of habitat >1000ha and the importance for recovery of the population, habitats on offsets score high using the referral

		also states that secondary habitat of low to moderate abundance of primary food trees is classed as HQS9. Is that a fair score?	guidelines and so habitats with feed trees have HQS of 9 and 10. The last paragraph has been amended to read 'Areas with low-moderate abundance of primary feed trees were classed as HQS 8'.
6	Table 1-2	As part of the update 3 of the BOSR, there is no update on the investigation status for Lowland Rainforest properties 22, 23 and 24. Are you able to provide any update or the likelihood of these sites being secured? The same applies to sites 32 – to 36	As shown in Table 1-2, RMS owns Sites 22, 24, 32, 33 and 34 so they are already secured and BioBanking applications will be submitted to OEH once this BOSR and other relevant plans are approved. Sites 17, 23, 29, 30, 31 and 36 are privately owned. RMS has agreed the conservation area and management actions as detailed in the draft conservation proposal included in the relevant site assessment reports (Appendix D) with each landowner and all have indicated they are willing to enter into a BioBanking Agreement. This process will be progressed upon approval of this BOSR and other relevant plans. RMS is currently negotiating the acquisition of Site 35 in order to secure this property.
7	Section 1.3 'Site Selection'	This section is a bit confusing. Update 3 consists of the proposed additional 14 properties to cover MNES for lowland Rainforest and Broadwater and Coolgardie/Wardell populations. This section states – detailed assessments have been completed for 26 of the 36 properties identified in updates 1, 2 and 3 of the BOSR. The status of the remaining 10 properties looks incomplete. This section also indicates that the 26 properties that have detailed assessments, 21 have conservation areas. It is unclear which remaining 5 sites don't have conservation areas identified and what are the reasons for not having the conservation agreements in place? Regarding the proposed management measures for each site under Biobanking (as per Appendix C) which sites have these	Additional text has been added prior to Table 1-2 to clarify the status of the remaining 10 properties. The 26 properties that have been assessed in detail are shaded in Table 1-2, with the final column of that table indicating if a covenant area has been established. The five sites without current conservation areas include Sites 4, 14, 16, 20 and 26. Conservation areas have yet to be developed as these sites are not required to offset any of the priority species listed in NSW approval condition D4. These will all be assessed for inclusion in the overall Biodiversity Offset Package for this project. In addition, Sites 6, 11, 15, 18, 27 and 28 which have not been assessed in detail will be considered for inclusion in the Biodiversity Offset Package. Thus of the total 36 sites, four have been deemed as unsuitable or withdrawn by landowners and this

		draft conservation agreements in place? And for the sites that don't have the draft conservation agreements in place, such as the Biobanking document at Appendix C, what sort of conservation agreement, or schedule of works will be in place for those other 'non Biobanking sites' ? For the sites that don't have these draft schedules, more information would need to be provided for those sites to ensure that all proposed management measures and monitoring programs will be documented.	is noted in Table 1-2. All of the sites nominated to offset the priority species in D4 have draft Conservation Proposals included as Attachment C to the site assessment report. Roads and Maritime is committing to fund the management actions as listed in the Property works program table. All sites are proposed to be BioBanked, so will be monitored by OEH. As additional sites are selected for inclusion in the Biodiversity Offset Package, draft Conservation Proposals will be developed.
Document		**Threatened Biodiversity Offset Status Report Matters of National Environmental Significance (Update 3)**	
Version No.		Rev 03 02 May 2016	
Agency Name		Department of Planning and Environment	
Date		20 May 2016	
Item	**Condition No/Report Reference**	**Additional Comments**	**RMS Response**
1	Section 1.4	1st dot point – Table 1-2 not 1-1.	Corrected.
2	Table 1-2	Add note to state that where a property is to be assessed as part of the Biodiversity Offset Package, the assessment is to determine the potential of the site to offset non-priority MNES and NSW vegetation communities.	Added to text preceding Table 1-2.
3	Figure 1-1	The Sapphire to Woolgoolga Upgrade project has been completed – update the figure.	Figure 1-1 will be updated to show Sapphire to Woolgoolga and Devil's Pulpit as completed and Woolgoolga to Halfway Creek and Halfway Creek to Glenugie as under construction.
4	Section 3.5	2nd paragraph page 26 – states a conservative approach to the habitat quality scores on the Update 2 properties has been	The mitigation strategy for the Coolgardie population and information about movement corridors and activity levels has

		implemented to take into account future indirect impacts. The Update 3 properties are also close to or adjoin the road alignment. Has this conservative approach been adopted for the HQS for these properties?	progressed substantially since Update 2, and so this should have some influence on the approach for HQS. The update 3 properties also have greater evidence for the presence of a resident population of Koala including known movement corridors with primary and secondary food trees, in comparison to the smaller areas of habitat on the update 2 properties (with the exception of Site 17). The habitat values for Koala on the majority of Update 3 properties at Wardell are also currently being degraded and are under threat from further impacts which could be alleviated with an offset agreement. TEXT ADDED "The presence of a resident Koala population on the Update 3 properties and surrounding areas at Wardell has been identified as part of the Ballina Koala Plan (Niche, 2016) and recent biodiversity surveys of these offset properties, including associated habitat quality, activity levels and movement corridors. The approach for HQS for the Update 3 properties at Wardell takes into consideration these habitat values, as well as existing threats to the population and the potential for further habitat degradation impacting the population, the proposed management actions to be provided under a conservation agreement, the potential for security of known movement corridors, and the HQS identified for each habitat type in the impact area to provide consistency between comparable habitat types on the offset properties. The Update 3 properties will also complement mitigation measures proposed as part of the project as detailed in the Ballina Koala Plan (Niche 2016) including crossing structures, fencing and rehabilitation of Koala habitat. The approach for HQS for the Broadwater population takes into account the presence of an active population confirmed during the offset site surveys, limited impacts to connectivity from the project west of Site 33, 34 and 35 and areas of higher quality habitat are

			around 400 metres from the project impacts. There will be greater impacts to connectivity at Site 36 which is west of the project and the HQS for areas of high quality habitat on this site has been reduced to account for this impact. "
Site reports			
5	Site 29	Section 2.5 provides the criteria to identify Koala habitat, being primary and secondary (Class A, B and C). Section 3.5 describes fauna habitat on the site and the fauna habitat is listed in Table 3-3. The Koala habitat quality includes Tertiary habitat. It is recommended that section 2.5 include Tertiary habitat in the criteria for assessment of fauna habitats. This comment applies to other site reports which do not include Tertiary habitat as fauna habitat criteria. Section 3.5.1 includes an incorrect reference to section 2.6, should be section 2.5.	Description of Tertiary Habitat added to Section 2.5 of all relevant site assessment reports. Corrected.
6	Site 30	See comment 5. Table 3-1 – the site includes 5.71 ha of cleared land (approximately 20% of the proposed conservation area), which is identified in Figure 3-3 as potential rehabilitation sites. The proposed Conservation Agreement is silent on the future use of the cleared land and its potential rehabilitation. Further information should be provided on the status of the cleared land under the conservation agreement and who would undertake, manage and fund rehabilitation of the cleared areas. Sections 3.4 and 4.6 – incorrect references to the site adjoining the Broadwater National Park. Section 3.5 – discussion/description of the cleared/modified habitat is missing.	As above. A rehabilitation/revegetation plan will be developed for this area which will incorporate assisted regeneration and, if required, active revegetation with koala food trees. The implementation of the plan will be funded under the BioBanking Agreement. Details will be added to the proposed Conservation Agreement. Corrected. Added. The area is starting to naturally regenerate with Swamp Mahogany's since the cessation of cane farming.
7	Site 31	See comment 5 in relation to Tertiary habitat.	As above.
8	Site 32	See comment 5 in relation to Tertiary habitat.	As above.

		Figure 3-2 identifies the cleared land (Map Unit 6) as Koala habitat rehabilitation areas and Figure 4-1 identifies cleared land as potential rehabilitation sites. The proposed Conservation Agreement is silent on the future use of the cleared land and its potential rehabilitation. Further information should be provided on the status of the cleared land under the conservation agreement and who would undertake, manage and fund rehabilitation of the cleared areas.	The cleared area on Site 32 has been identified as a priority koala food tree revegetation area under the Koala Revegetation Strategy (revegetation patch 1). The initial works will be funded under a separate contract covering all of the revegetation sites. This will provide for watering, weeding, seedling replacement, the exclusion of grazing and monitoring as outlined in the strategy. Provisions will be made in the BioBanking Agreement for the on-going maintenance of this revegetation area.
9	Site 33	See comment 5 in relation to Tertiary habitat.	As above.
10	Site 34	See comment 5 in relation to Tertiary habitat. Over 60% of the proposed conservation area is cleared land. The report is silent on the future use of the cleared land. Further information should be provided on the status of the cleared land under the conservation agreement.	As above. As this site is not currently required to offset the Broadwater koala population, the cleared area has been excluded from the proposed offset area. If no further offsets are required for this population and this site is not required for other offsets, this site may be excluded from the Biodiversity Offset Package.
11	Site 35	See comment 5 in relation to Tertiary habitat.	As above.
12	Site 36	See comment 5 in relation to Tertiary habitat. Figure 4-1 identifies the cleared land as potential rehabilitation sites. Further information should be provided on the status of the cleared land under the conservation agreement and who would undertake, manage and fund rehabilitation of the cleared areas.	As above. A rehabilitation/revegetation plan will be developed for this area which will incorporate assisted regeneration and, if required, active revegetation with koala food trees. The implementation of the plan will be funded under the BioBanking Agreement. Details will be added to the proposed Conservation Agreement.

Appendix E. Biodiversity Offset Assessments for each potential offset property

Site ID.	Adjacent Project Section	Location (Lot / DP)	Tenure	Area (approx. ha)	Investigation Status	Proposed covenant area (approx. ha)
1	1	Dirty Creek [redacted]	Private	42	Update 1 preliminary investigations only	
2	3	Pillar Valley [redacted]	Private	363	Update 2 detailed targeted surveys and proposed covenant established	233
3	3	Tucabia [redacted]	Private	339		250
4	3	Pillar Valley [redacted]	Private	116	Update 2 detailed targeted surveys	
5	3	Pine Brush [redacted]	Private	341	Update 1 preliminary investigations only	
6	3	Tyndale [redacted]	Private	152	After withdrawing from Update 1, landowner has re-entered the program in Update 3.	
7	3	Tyndale (Lot 7002 / DP92575 and Lot 7001 / DP92573)	Crown	249	Property withdrawn	
8	3	Tyndale [redacted]	Private	36	Update 1 preliminary investigations only	
9	3	Tyndale [redacted]	Private	68	Update 2 detailed targeted surveys and proposed covenant established	53
10	3	Tucabia [redacted]	Private	409		394
11	5	Maclean (Lot 20 and 23 / DP230180) (Lot 7040 / DP1115009 and Lot 1 / DP230182)	RMS	20	Update 1 preliminary investigations only	
12	6	Mororo [redacted]	Private	160	Update 2 detailed targeted surveys and proposed covenants established.	106
13	6	Jackybulbin [redacted]	Private	585		517
14	8	Broadwater (Lot 6, 64 / DP755624)	RMS	22	Update 2 detailed targeted surveys	
15	8	Broadwater (Lot 212 / DP851963) (Lot 133 / DP839607) and (Lot 1 DP618666)	RMS	65	Update 1 preliminary investigations only. Part of site proposed as a direct land transfer to NPWS. Residual to be assessed for the Biodiversity Offset Package.	
16	8	Bungawalbin (Lot 21 / DP 755601 and Lot 2 DP 1112483)	RMS	386	Update 2 detailed assessment. Residual area of 23 ha available for W2B, rest of site offsetting Devil's Pulpit project.	

Site ID.	Adjacent Project Section	Location (Lot / DP)	Tenure	Area (approx. ha)	Investigation Status	Proposed covenant area (approx. ha)
17	8	Buckombi[redacted]	Private	61	Update 2 detailed targeted surveys and proposed covenant established.	32
18	10	Wardell (Lot 7 / DP866508; Lot 1 and 2 / DP1123846; Lot 2 / DP1113572)	RMS	86	Update 1 preliminary investigations only	
19	10	Wardell (Lot 2 / DP614714)	RMS	36	Update 2 detailed targeted surveys and proposed covenant established (for all except Site 20).	19
20	10	Wardell (Lot 174 and Lot 154 / DP755731)	RMS	52		
21	10	Wardell (Lot 1 and Lot 2 / DP733934)	RMS	28		24
22	10	Wardell (Lot 2 / DP543525)	RMS	72		30
23	10	Wardell[redacted]	Private	25		19
24	10	Wardell (Lot 61 / DP1088684)	RMS	31		26
25	3	Pillar Valley (Lot 2 DP718612; Lot 9 DP1163255)	RMS	426	Property identified in Update 2 with detailed targeted surveys undertaken and proposed covenant established	395
26	3	Tucabia[redacted]	Private	16	Properties identified in Update 2 with detailed targeted surveys undertaken	
27	1	Dirty Creek[redacted]	Private	160	Property identified in Update 2 with detailed targeted surveys undertaken. Landowner withdrew from Update 2 but will be assessed for the Biodiversity Offset Package.	
28	2/3	Lot 109 (DP751374) Sunnyside Road, Glenugie	RMS	600	This property includes biodiversity offsets for the Glenugie Upgrade in addition to surplus areas of habitat available for the W2B project.	219
29	10	[redacted] Wardell	Private	55	Additional properties identified in Update 3 with detailed targeted surveys undertaken in April/March 2016 and proposed covenants established.	16
30	10	[redacted] Wardell	Private	63		29
31	10	[redacted] Wardell	Private	19		19

Site ID.	Adjacent Project Section	Location (Lot / DP)	Tenure	Area (approx. ha)	Investigation Status	Proposed covenant area (approx. ha)
32	10	Lot 6 (DP843369) Old Bagotville Road, Wardell	RMS	47		20
33	8	Lot 140 (DP755624) Pacific Highway, Woodburn	RMS	15		13
34	8	Lot 5 (DP1151619) Pacific Highway, Woodburn	RMS	23		14
35	8	[redacted] Doonbah	Private	104		99
36	8	[redacted] Woodburn	Private	107		17