

CONSTRUCTION FLORA AND FAUNA MANAGEMENT SUB PLAN

Sancrox Traffic Arrangement Project

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Contents

Acronyms and Abbreviations.....	5
1 Introduction	6
1.1 Context	6
1.2 Background.....	6
1.3 Environmental management systems overview	6
2 Purpose and objectives	8
2.1 Purpose	8
2.2 Objectives.....	8
2.3 Targets and indicators	8
3 Environmental requirements.....	10
3.1 Relevant legislation and guidelines	10
3.1.1 Legislation	10
3.1.2 Guidelines.....	10
3.2 Minister’s Conditions of Approval.....	11
3.3 Statement of commitments	18
3.4 EPBC Act Approval Conditions	22
4 Environmental Aspects and Impacts	27
4.1 Environmental aspects.....	27
4.1.1 Endangered Ecological Communities (EEC).....	27
4.1.2 Threatened plant species.....	27
4.1.3 Fauna habitats	29
4.1.4 Threatened fauna	30
4.1.5 Aquatic fauna.....	31
4.2 Construction activities	31
4.3 Ecological impacts	32
4.3.1 Pre-construction surveys	33
5 Environmental Mitigation and Management Measures	34
5.1 Flora and fauna mitigation and management measures.....	34
5.2 Biodiversity offsets.....	34
6 Compliance management	44
6.1 Roles and responsibilities	44
6.2 Training.....	44
6.3 Inspections and Monitoring	44
6.4 Auditing.....	44
6.5 Reporting	44
7 Review and improvement.....	46
7.1 Continuous improvement	46
7.2 CFFMP update and amendment.....	46
Appendix A. Nest Box Plan	47

Appendix B.	Not Included.....	48
Appendix C.	Not Included.....	48
Appendix D.	Not Included.....	48
Appendix E.	Not Included.....	48
Appendix F.	Pre-clearing check list	49
Appendix G.	Working Around Trees Guideline.....	50
Appendix H.	Fauna Handling and Rescue Procedure.....	51
Appendix I.	Unexpected Threatened Species / EECs Procedure	52
Appendix J.	Weed and Plant Pathogen Management Plan	53
Appendix K.	Sancrox Project Study Areas.....	54
Appendix L.	Fauna mapping	57

Acronyms and Abbreviations

CEMP	FAA Construction Environmental Management Plan
CFFMP	FAA Construction Flora and Fauna Management Plan
CEED	Critically Endangered Ecological Community
CLM Act	Contaminated Land Management Act 1997
CoA	Condition of Approval
DECCW	NSW Department of Environment, Climate Change and Water. <i>Note: DECC is a defunct name. Now it is responsibility of The New South Wales Office of Environment and Heritage (OEH).</i>
DPI	NSW Department of Primary Industries (Fishing and Aquaculture)
DP&I	Department of Planning and Infrastructure
EA	The Oxley Highway to Kempsey – Upgrading the Pacific Highway – Environmental Assessment (RTA 2010)
EEC	Endangered Ecological Community
EPA	NSW Environment Protection Authority
EP&A Act	NSW Environmental Planning and Assessment Act 1979
EPBC Act	Commonwealth Environmental Protection and Biodiversity Conservation Act 1999
EPL	Environment Protection Licence
ER	Environmental Representative
ESD	Ecologically Sustainable Development
ESR	FAA Environmental Site Representative
EWMS	Environmental Work Method Statement
FAA	Ferrovial Agroman Australia
FM Act	NSW Fisheries Management Act 1994
NPW Act	NSW National Parks and Wildlife Act 1974
NV Act	Native Vegetation Act 2003
NW Act	NSW Noxious Weeds Act 1993
PM	FAA Project Manager
POEO Act	Protection of the Environment Operations Act 1997
The Project	Sancrox Traffic Arrangement (the Project).
Q&E Manager	FAA Quality and Q & E Manager
OEH	NSW Office of Environment and Heritage
Roads and Maritime	Roads and Maritime Services
SoC	Revised Statement of Commitments included in the Submissions Report
The Principal	Roads and Maritime project representative
TSC Act	NSW Threatened Species and Conservation Act 1995
WHS Act	Work Health and Safety Act 2011

1 Introduction

1.1 Context

This Construction Flora and Fauna Management Sub Plan (CFFMP or this Plan) forms part of the Construction Environmental Management Plan (CEMP) for the Sancrox Traffic Arrangement Works (the Project) which is part of the upgrade of the Pacific Highway between Oxley and Kempsey.

This CFFMP has been prepared to address the relevant requirements of the NSW Minister for Planning and Infrastructure’s Conditions of Approval (CoA), the Roads and Maritime Statement of Commitments (SoC), the Commonwealth Department of the Environment Conditions of Approval, the mitigation and management measures listed in the Oxley Highway to Kempsey Environmental Assessment (EA) and all applicable legislation.

This Plan will be continually updated to reflect any changes that may have effects on flora and fauna management, such as Project design adjustments and the results of pre-clearing surveys.

1.2 Background

The Oxley Highway to Kempsey – Upgrading the Pacific Highway – Environmental Assessment by RTA (2010) (EA) assessed the impacts of construction and operation of the Project on flora and fauna within the study area shown in Appendix K..

As part of EA development, a detailed flora and fauna assessment was prepared to address the EA requirements issued by the DP&I. The flora and fauna assessment was included in the EA as Volume 2 – Flora and Fauna Working Paper.

The EA concluded that there were unlikely to be significant residual flora and fauna impacts associated with the construction and operation of the Project, following the implementation of the proposed mitigation and management measures identified in the EA.

The Oxley Highway to Kempsey Project was referred to the Commonwealth Department of the Environment (formerly the Department of Sustainability, Environment, Water, Population and Communities) on the 24 August 2012 due to the potential significant impact on a number of species listed under the Environmental Protection and Biodiversity Conservation Act, 1999 (EPBC Act) including the Koala, Grey-headed Flying-fox, Spotted –tail Quoll and Giant Barred Frog. The Oxley Highway to Kempsey Project was declared a controlled action on 21 September 2012 and was approved by the Minister for the Environment on 24 January 2014, subject to a number of conditions being met.

1.3 Environmental management systems overview

The overall Environmental Management System for the Project is described in the CEMP.

The CFFMP is part of the **Ferrovia Agroman Australia (FAA)** environmental management framework for the Project, as described in Section 4.1 of the CEMP. In accordance with CoA Clause B.31 (b), this Plan has been developed in consultation with the Environment Protection Authority (EPA). The Department of Primary Industries (Fishing and Aquaculture) DPI has also been consulted.

Mitigation and management measures identified in this Plan will be incorporated into site or activity specific Environmental Work Method Statements (EWMSs).

EWMSs will be developed and signed off by FAA prior to commencement of associated works. Construction personnel will be required to undertake works in accordance with the identified mitigation and management measures.

Used together, the CEMP, strategies, procedures and EWMSs form management guides that clearly identify required environmental management actions for reference by **FAA** personnel and contractors.

The review and document control processes for this Plan are described in Section 9 and 10 of the CEMP.

2 Purpose and objectives

2.1 Purpose

The purpose of this Plan is to describe how construction impacts on ecology will be minimised and managed, within the study areas shown in Appendix K

2.2 Objectives

The key objective of the CFFMP is to ensure that impacts to flora and fauna are minimised. To achieve this objective, the following will be undertaken:

- Ensure appropriate controls and procedures are implemented during construction activities to avoid or minimise potential adverse impacts to flora and fauna along the Project corridor.
- Ensure appropriate measures are implemented to address safeguards detailed in the CoA and SoC outlined in Table 3-1 and Table 3-2, and management measures detailed in the EA.
- Ensure appropriate measures are implemented to comply with all relevant legislation and other requirements as described in Section 3.1 and Section 3.4 of this Plan.

2.3 Targets and indicators

The following targets have been established for the management of flora and fauna impacts during the project:

- Ensure full compliance with the relevant legislative requirements, CoA and SoC as well as relevant Roads and Maritime specifications and guidelines.
- No disturbance to flora and fauna outside the proposed construction footprint and associated access tracks and site compounds.
- No increase in distribution of weeds currently existing within the project areas.
- No new weeds introduced to the project areas.
- No net loss of significant habitat resources including hollow logs and tree nesting hollows, with materials cleared from the construction area re-used in adjacent areas where possible.
- Effective rehabilitation / revegetation that ensures different successional stages of rehabilitation are achieved.
- No fauna mortality during construction.
- Not facilitate spread of feral animals as a result of construction.
- No pollution or siltation of aquatic ecosystems, wetlands, endangered ecological communities or threatened species habitat.
- Provide effective fauna movement and fish passage.
- Ensure full compliance with the relevant legislative requirements, CoA and SoC.
- Meet environmental protection licence water quality discharge parameters for all planned basin discharges (ie those within design capacity).
- Manage downstream water quality impacts attributable to the Sancrox Traffic Arrangement Project (ie maintain water waterway health by avoiding the introduction of nutrients, sediment and chemicals outside of that permitted by the environmental

protection licence and/or Australian and New Zealand guidelines for fresh and marine water quality (ANZECC guidelines).

- Ensure training on best practice soil and water management is provided to all construction personnel through site inductions.

3 Environmental requirements

3.1 Relevant legislation and guidelines

3.1.1 Legislation

Legislation relevant to flora and fauna management includes:

- *Environmental Protection and Biodiversity Conservation Act 1999* (Commonwealth) (EPBC Act).
- *Environmental Planning and Assessment Act 1979* (EP&A Act).
- *National Parks and Wildlife Act 1974* (NPW Act).
- *Threatened Species and Conservation Act 1995* (TSC Act).
- *Fisheries Management Act 1994* (FM Act).
- *Noxious Weeds Act 1993* (NW Act).
- *Pesticides Act 1999*.
- Protection of the Environment Operations Act 1997
- *Animal Research Act 1985*.

Relevant provisions of the above legislation are explained in the register of legal and other requirements included in Appendix A1 of the CEMP.

3.1.2 Guidelines

The main guidelines, specifications and policy documents relevant to this Plan include:

- “Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects - Revision 0 September 2011”.
- Roads and Maritime QA Specification G36 – Environmental Protection (Management System).
- Roads and Maritime QA Specification G40– Clearing and Grubbing.
- Roads and Maritime QA Specification R178 – Vegetation.
- Roads and Maritime QA Specification R179 – Landscape Planting.

- Roads and Maritime Environmental Direction No.25 - Management of Tannins from Vegetation Mulch (January 2012).
- Roads and Maritime *Practice Note: Clearing and Fauna Management – Pacific Highway Projects* (May 2012).
- Roads and Maritime *Biodiversity Guidelines* (September 2011).
- NSW Department of Primary Industries, *Why Do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings*, Fairfull and Witheridge, 2003;
- *Fishnote – Policy and Guidelines for Fish Friendly Waterway Crossings* – November 2003;
- NSW National Parks & Wildlife Service. 2001. *Policy for the Translocation of Threatened Fauna in NSW: Policy and Procedure Statement No. 9* Threatened Species Unit, Hurstville NSW.
- Australian Network for Plant Conservation. 2004. *Guidelines for the Translocation of Threatened Plants in Australia*, 2nd Edition.
- DECCW 2008. *Hygiene protocol for the control of disease in frogs*.

3.2 Minister’s Conditions of Approval

The CoA relevant to this CFFMP are listed Table 3-1 below. A cross reference is also included to indicate where the condition is addressed in this CFFMP or other Project management documents. Where conditions are not specifically addressed in this Plan, the relevant document is referenced.

Table 3-1 Conditions of Approval relevant to the FFMP

CoA No.	Condition Requirements	Document Reference
CoA B1	The Proponent shall design (and implement) the fauna and waterway crossings identified in Table 6-2 of Appendix B of the document listed under condition A1 (d), at the locations and in accordance with the minimum design principles identified in Table 6-2, unless otherwise agreed by the Director-General.	Not included in Sancrox Traffic Management Project Scope of Works.
CoA B2	Investigations into the design of fauna and waterway crossings identified in Table 6-2 of Appendix B of the document listed under condition A1(d) during detailed design shall be undertaken with the input of a suitably qualified and experienced ecologist and in consultation with the OEH and DPI (Fishing and Aquaculture).	Not included in Sancrox Traffic Management Project Scope of Works.
CoA B3	The Proponent shall prepare a report on the final design of fauna and/or waterway crossings identified in Table 6-2 of Appendix B of the document listed under condition A1(d), where the location of the crossing has changed and/or the crossing does not meet the minimum design principles identified in Table 6-2. The report shall be	Not included in Sancrox Traffic Management Project Scope of Works.

CoA No.	Condition Requirements	Document Reference
	<p>submitted to the Director-General prior to the commencement of construction of the relevant crossing, and shall demonstrate how the new location and/or design would result in acceptable biodiversity outcomes. The report shall clearly identify how the fauna and/or waterway crossing will work in conjunction with complementary fauna exclusion fencing measures to be implemented for the project. The report shall be accompanied by evidence of consultation with the OEH and DPI (Fishing and Aquaculture) in relation to the suitability of any changes to the location and/or crossing design.</p>	
CoA B4	<p>The Proponent shall investigate the provision of widened medians (with the aim of retaining existing vegetation in a widened median where feasible and reasonable) as an alternative to the provision of glider poles and rope bridges to facilitate the movement of gliders across the project at the following locations:</p> <ul style="list-style-type: none"> (a) Cairncross 1 – between station 10000 to 11600; (b) Ballengarra 1b – between station 23200 to 24100; and (c) Maria River 1b – between station 33760 to 34380. <p>This investigation shall be undertaken by a suitably qualified and experienced ecologist and in consultation with the OEH and DPI (Forests). The Proponent shall prepare a report on the median widening investigation, including the location and final design of the glider crossing measures and consequential impacts on other ecologically significant elements potentially affected by the widening. The report shall be submitted for the approval of the Director General no later than six months prior to the commencement of work that would result in the disturbance of native vegetation in the median widening investigation areas, or within such period otherwise agreed by the Director General. Work within the median investigation areas shall not commence until written approval has been received from the Director General.</p>	<p>These CoA are located outside the contract area of the Sancrox Traffic Arrangement works for which FAA is responsible</p>
CoA B5	<p>As part of the investigation into widened medians under condition B4, the Proponent shall investigate and report on the provision of widened medians at Barrys Creek (station 23967) as an alternative fauna crossing design for Koalas and Quolls.</p>	<p>These CoA are located outside the contract area of the Sancrox Traffic Arrangement works for which FAA is responsible</p>
CoA B6	<p>The Proponent shall, in consultation with the EPA and DPI (Fishing and Aquaculture), ensure that all waterway crossings are designed and constructed consistent with the principles of the Guidelines for Controlled Activities Watercourse Crossings (Department of Water and Energy, February 2008), Policy and Guidelines for Fish Friendly Waterway Crossings (NSW Fisheries, February 2004) and Policy and Guidelines for Design and Construction of Bridges, Roads, Causeways, Culverts and Similar Structures (NSW Fisheries 1999). Where multiple cell culverts are proposed for creek crossings, at least one cell shall be provided for fish passage, with an invert or bed level that mimics creek flows.</p>	<p>Section 4.1.5 Aquatic Fauna</p>
CoA B7	<p>Prior to the commencement of construction work that would result in the disturbance of native vegetation (or as otherwise agreed by the Director General), the Proponent shall, in consultation with the EPA, prepare and</p>	<p>Appendix A – Nest Box Plan</p>

CoA No.	Condition Requirements	Document Reference
	submit for the approval of the Director General a Nest Box Plan to provide replacement hollows for displaced fauna. The Plan shall detail the number and type of nest boxes to be installed which must be justified based on the number and type of hollows removed (based on detailed pre-construction surveys), the density of hollows in the area to be cleared and adjacent forest, and the availability of adjacent food resources. The Plan shall also provide details of maintenance protocols for the nest boxes installed including responsibilities, timing and duration.	
CoA B8	<p>The Proponent shall, in consultation with the OEH and DPI (Fishing and Aquaculture), develop a Biodiversity Offset Strategy that identifies the available options for offsetting the biodiversity impacts of the project in perpetuity, with consideration to the Principles for the use of biodiversity offsets in NSW (Office of Environment and Heritage website http://www.environment.nsw.gov.au/biocertification/offsets.htm dated 17 June 2011). Unless otherwise agreed to by the OEH and DPI (Fishing and Aquaculture), offsets shall be provided on a like-for-like basis and at a minimum ratio of 4:1 for areas of high conservation value (including EEC, salt marsh and poorly conserved vegetation communities identified as being more than 75% cleared in the catchment management area) and 2:1 for the remainder of native vegetation areas (including mangroves, seagrass, and non-EEC riparian vegetation). The Strategy shall include, but not necessarily be limited to:</p> <ul style="list-style-type: none"> (a) the aims and objectives of the biodiversity offset strategy; (b) confirmation of the vegetation type/ habitat (in hectares) to be cleared and their condition, and the size of offsets required (in hectares); (c) details of the type of available offset measures that have been identified to compensate for the loss of threatened species and vulnerable and endangered ecological communities and/ or their habitats, and native vegetation (including mangroves, seagrasses, salt marsh and riparian vegetation). The measures shall achieve a neutral or net beneficial outcome for all the biodiversity values likely to be impacted directly or indirectly during both the construction and operation of the project; (d) the decision-making framework that would be used to select the final suite of offset measures to achieve the aims and objectives of the Strategy, including the ranking of offset measures; (e) a process for addressing and incorporating offset measures arising from changes in biodiversity impacts (where these changes are generally consistent with the biodiversity impacts identified for the project in the documents listed under condition A1), including: <ul style="list-style-type: none"> (i) changes to the footprint due to detailed design; (ii) changes to predicted impacts as a result of changes to mitigation measures; (iii) the identification of additional species/ habitat through pre-clearance surveys and construction; and (iv) additional impacts associated with the establishment of ancillary facilities. 	Biodiversity Offset Strategy (Roads and Maritime 2013)

CoA No.	Condition Requirements	Document Reference
	<p>(f) options for the securing and management of biodiversity offsets in perpetuity.</p> <p>The Biodiversity Offset Strategy shall be submitted to the Director General for approval no later than 6 weeks prior to the commencement of construction that would result in the disturbance of native vegetation, unless otherwise agreed by the Director General.</p> <p>The Proponent- may elect to satisfy the requirements of this condition by identifying a suitable offset strategy which addresses impacts from multiple Pacific Highway Upgrade projects within the North Coast Bio-region. Any such strategy, including an agreement made with the OEH, must be made in consultation with the Department and approved by the Director General within a timeframe agreed to by the Director General.</p>	
CoA B9	<p>Within two years of the date of approval of the Biodiversity Offset Strategy, unless otherwise agreed by the Director General, the Proponent shall prepare and submit a Biodiversity Offset Package for the approval of the Director General. The Package shall be developed in consultation with the EPA and DPI (Fishing and Aquaculture), and shall include, but not necessarily be limited to:</p> <ul style="list-style-type: none"> (a) details of the final suite of the biodiversity offset measures to be implemented for the project demonstrating how it achieves the requirements of the Biodiversity Offset Strategy (including specified offset ratios); (b) the final selected means of securing the biodiversity values of the Package in perpetuity, including ongoing management, maintenance and monitoring requirements; and (c) timing and responsibilities for the implementation of the provisions of the Package over time. <p>The requirements of the Package shall be implemented by the responsible parties according to the timeframes set out in the Package, unless otherwise agreed by the Director General.</p>	Roads and Maritime will prepare a Biodiversity Offset Package for the Project.
CoA B10	<p>The Proponent shall develop an Ecological Monitoring Program to monitor the effectiveness of the biodiversity mitigation measures implemented as part of the project. The program shall be developed by a suitably qualified and experienced ecologist in consultation with the OEH and DPI (Fishing and Aquaculture) and shall include but not necessarily be limited to:</p> <ul style="list-style-type: none"> (a) an adaptive monitoring program to assess the effectiveness of the mitigation measures identified in conditions B1, B4, B7 and B31(b) and allow amendment to the measures if necessary. The monitoring program shall nominate performance parameters and criteria against which effectiveness will be measured and include operational road kill surveys to assess the effectiveness of fauna crossings and exclusion fencing implemented as part of the project; (b) mechanisms for developing additional monitoring protocols to assess the effectiveness of any additional mitigation measures implemented to address additional impacts in the case of design amendments or unexpected threatened species finds during construction (where these additional impacts are generally 	Ecological Monitoring Program

CoA No.	Condition Requirements	Document Reference
	<p>consistent with the biodiversity impacts identified for the project in the documents listed under condition A1);</p> <p>(c) monitoring shall be undertaken during construction (for construction-related impacts) and from opening of the project to traffic (for operation/ ongoing impacts) until such time as the effectiveness of mitigation measures can be demonstrated to have been achieved over a minimum of three successive monitoring periods (i.e 6 years) after opening of the project to traffic, unless otherwise agreed by the Director General. The monitoring period may be reduced with the agreement of the Director General in consultation with the OEH and DPI (Fishing and Aquaculture), depending on the outcomes of the monitoring;</p> <p>(d) provision for the assessment of the data to identify changes to habitat usage and whether this can be directly attributed to the project;</p> <p>(e) details of contingency measures that would be implemented in the event of changes to habitat usage patterns directly attributable to the construction or operation of the project; and</p> <p>(f) provision for annual reporting of monitoring results to the Director General and the OEH and DPI (Fishing and Aquaculture), or as otherwise agreed by those agencies.</p> <p>The Program shall be submitted to the Director General for approval no later than 6 weeks prior to the commencement of construction that would result in the disturbance of native vegetation (unless otherwise agreed by the Director General).</p>	
CoA B31	<p>As part of the Construction Environment Management Plan for the project required under condition B30, the Proponent shall prepare and implement the following sub plan(s):</p> <p>(b) a Construction Flora and Fauna Management Sub-plan to detail how construction impacts on ecology will be minimised and managed. The sub-plan shall be developed in consultation with the OEH and DPI (Fishing and Aquaculture) and shall include, but not necessarily be limited to:</p> <p>(i) details of pre-construction surveys undertaken to verify the construction boundaries/footprint of the project based on detailed design and to confirm the vegetation to be cleared as part of the project (including tree hollows, threatened flora and fauna species, mangroves, seagrass and riparian vegetation). The surveys shall be undertaken by a suitably qualified and experienced ecologist and include targeted surveys during suitable conditions for Koalas, Green-thighed Frog, Giant Barred Frog and microbats within and in the vicinity of the project corridor;</p> <p>(ii) updated sensitive area / vegetation maps based on B31(b)(i) above and previous survey work;</p> <p>(iii) details of general work practices and mitigation measures to be implemented during construction to minimise impacts on native fauna and native vegetation (particularly threatened species and EECs) not proposed to be cleared as part of the project, including, but not necessarily limited to: fencing of sensitive areas, a protocol for the removal and relocation of fauna during clearing, presence of a suitably</p>	<p>Section 4.3</p> <p>Appendix F – Pre-clearing Checklist</p> <p>Appendix A6 of the CEMP</p> <p>Section 5</p> <p>Appendix F – Pre-clearing Checklist</p> <p>Appendix G – Working Around Trees Guidelines</p>

CoA No.	Condition Requirements	Document Reference
	<p>qualified and experienced ecologist to oversee clearing activities and facilitate fauna rescues and re-location, clearing timing with consideration to breeding periods, measures for maintaining existing habitat features (such as bush rock and tree branches etc), seed harvesting and appropriate topsoil management, construction worker education, weed management (including controls to prevent the introduction or spread of <i>Phytophthora cinnamomi</i>), erosion and sediment control and progressive re-vegetation;</p>	<p>Appendix H – Fauna Handling and Rescue Procedure Appendix J – Weed and Plant Pathogen Management Plan</p>
	<p>(iv) specific procedures to deal with EEC/threatened species anticipated to be encountered within the project corridor including re-location, translocation and/or management and protection measures;</p>	<p>Section 5 Appendix H – Fauna Handling and Rescue Procedure Appendix I - Unexpected Threatened Species / EECs Procedure</p>
	<p>(v) a management strategy for the Green-thighed Frog and Giant Barred Frog in the case that the pre-construction surveys identify the presence of these species or its habitats in the project corridor or its vicinity. The strategy shall include details of the measures to avoid, minimise and mitigate impacts to these species; <i>Note: The Green-thighed Frog and Giant Barred Frog were not identified within the Project area.</i></p>	
	<p>(vi) a Microbat management strategy in the case that the pre-construction surveys (undertaken at least 12 months in advance of disturbance to potential roosting structures, or as agreed by the Director General) identify the presence of or evidence of microbat roosting in the project corridor or its vicinity. The strategy shall detail measures to avoid, minimise and mitigate impacts to microbats and identified roost sites, including short and long term management measures; <i>Note: Microbats were not identified within the Project area during surveys.</i></p>	
	<p>(vii) an aquatic vegetation management strategy for mangroves and seagrass. The strategy shall:</p> <ol style="list-style-type: none"> i. identify the potential for the translocation of mangroves and/or seagrass impacted by the project; ii. if translocation is feasible, include details of a translocation plan consistent with Policy and Guidelines for Fish Habitat Conservation and Management (NSW Fisheries 1999) including details of ongoing maintenance such as responsibilities, timing and duration; iii. identify a process for incorporating appropriate compensatory habitat for mangroves and/or seagrass impacted by the project in the Biodiversity Offset Strategy referred to in condition B8 of this approval, should the information obtained during the investigation find that translocation is not feasible or where the monitoring undertaken finds that translocation measures have not been 	<p>Section 5 There are no mangroves or seagrasses areas within the project boundaries or subject to the Sancrox Traffic Management Project Scope of Works impact zones.</p>

CoA No.	Condition Requirements	Document Reference
	successful (as identified through performance criteria); and iv. include detail of the mitigation measures to be implemented during construction to avoid and minimise impacts to areas identified to contain these species, including impacts from the use and storage of construction plant, equipment, materials and entry by personnel;	
	(viii) a procedure for dealing with unexpected EEC/threatened species identified during construction including cessation of work and notification of the OEH, determination of appropriate mitigation measures in consultation with the OEH (including relevant re-location measures) and update of ecological monitoring and/or biodiversity offset requirements consistent with conditions B8 and B10; and	Section 5 Appendix H – Fauna Handling and Rescue Procedure Appendix I - Unexpected Threatened Species / EECs Procedure
	(ix) mechanism for the monitoring, review and amendment of this sub-plan;	Section 7

3.3 Statement of commitments

Relevant SoC are listed Table 3-2 below. This includes reference to required outcomes, the timing of when the commitment applies, relevant documents or sections of the environmental assessment influencing the outcome and implementation.

Table 3-2 Statement of commitments relevant to this CFFMP

Outcome	Ref #	Commitment	Timing	Reference Document	CFFMP Reference
Minimise impacts on native vegetation, fauna and their habitats	F1	Detailed design will minimise the area of native vegetation and habitat to be cleared wherever reasonable and feasible.	Detailed design	<i>Roads and Maritime QA Specification G36 Environmental Protection (Management System).</i>	Table 5-1 Mitigation Measure FF6
	F2.	The limits of clearing and other native vegetation disturbance will be clearly marked on relevant work plans and on site with temporary fencing installed prior to clearing.	Pre-construction and construction	Roads and Maritime QA Specification G36 Environmental Protection (Management System).	Table 5-1 Mitigation Measure FF6
L	F3.	Rehabilitation and revegetation will be undertaken in stages and as early as practicable to restore and enhance habitat opportunities.	Construction and operation	Roads and Maritime QA Specification G36 Environmental Protection (Management System).	Table 5-1 Mitigation Measure FF10
	F4.	Habitat features and resources for native fauna (such as hollow-bearing trees, hollow logs, nest boxes and bush rocks) impacted by the Proposal will be relocated where feasible and reasonable. Such relocation will be undertaken in a manner to limit damage to existing vegetation and will not occur in high condition remnant vegetation.	Pre-construction and construction	Roads and Maritime QA Specification G36 Environmental Protection (Management System).	Table 5-1 Mitigation Measure FF30 Appendix A – Nest Box Plan
	F5.	Native and locally indigenous plants will be used in the landscaping and disturbed areas will be progressively revegetated.	Construction and operation	Roads and Maritime QA Specification G36 Environmental Protection (Management System).	Table 5-1 Mitigation Measure FF10 and FF11

Outcome	Ref #	Commitment	Timing	Reference Document	CFFMP Reference
Minimise adverse impacts on aquatic habitat and fish species.	F6	Watercourse crossings will be designed to facilitate fish passage where appropriate and in consultation with relevant government agencies.	Detailed design Pre-construction	<i>Roads and Maritime QA Specification G36 Environmental Protection (Management System). Fish note: Policy and Guidelines for Fish Friendly Waterway Crossings. Policy and Guidelines for Design and Construction of Bridges, Roads, Causeways, Culverts and Similar Structures. Fish Passage Requirements for Waterway Crossings</i>	Table 5-1 Mitigation Measure FF31
	F7	Water quality control measures will be installed as early as possible in the construction program and will be designed / selected to meet identified receiving water objectives.	Pre-construction Construction	<i>Roads and Maritime QA Specification G36 Environmental Protection (Management System). (Refer to section 6.5) Roads and Maritime QA Specification G38 Soil and Water Management (Soil and Water Management Plan).</i>	Table 5-1 Mitigation Measure FF32
	F8.	A weed management strategy would be developed as part of the construction environmental management plan.	Pre-construction	Roads and Maritime QA Specification G36 All relevant Roads and Maritime policies, specifications, guidance notes and environmental directions.	Table 5-1 Mitigation Measure FF13 Appendix J – Weed and Plant Pathogen Management Plan
Manage impacts on threatened plant species where possible.	F9.	Threatened plants in proximity to the Proposal that are to be retained will be identified by pre construction surveys and protected during construction through exclusion fencing and education of construction workers through the site induction process.	Pre-construction	Roads and Maritime QA Specification G36 Environmental Protection (Management System).	Table 5-1 Mitigation Measure FF14

Outcome	Ref #	Commitment	Timing	Reference Document	CFFMP Reference
	F10.	The feasibility of relocating individuals of threatened species to suitable habitat will be investigated.	Pre-construction	Roads and Maritime QA Specification G36 (Refer to section 6.10) Environmental Protection (Management System). Australian Network for Plan Conservation 2004 guidelines	Table 5-1 Mitigation Measure FF15
Minimise impacts on native fauna during construction.	F11	Consideration would be given to constructing artificial frog ponds if appropriate.	Detailed design	<i>Roads and Maritime QA Specification G36</i> (Refer to section 6.10) <i>Environmental Protection (Management System)</i> .	
Minimise impacts on native fauna during construction.	F12.	A suitably qualified ecologist will undertake pre-clearance surveys. Searches will include nests and large hollow bearing trees and target habitats of hollow-dwelling species, koalas and frogs. Fauna species found in pre-clearance surveys will be relocated to suitable habitat as close as possible to the area in which they were found.	Pre-construction	Roads and Maritime QA Specification G36 (Refer to section 6.10) Environmental Protection (Management System).	Table 5-1 Mitigation Measure F24, Appendix F – Pre-clearing Checklist
	F13	Where feasible and reasonable, removal of frog habitat along drainage lines will not be undertaken during periods of wet weather.	Construction	<i>Roads and Maritime QA Specification G36</i> (Refer to section 6.10) <i>Environmental Protection (Management System)</i> .	Table 5-1 Mitigation Measure FF23,
	F14.	The construction contractor will maintain contact details for local DECCW officers, WIRES and/or other relevant local wildlife carer groups.	Pre-construction and construction	Roads and Maritime QA Specification G36 (Refer to section 6.10) Environmental Protection (Management System).	Table 5-1 Mitigation Measure FF33, Appendix H – Fauna Handling and Rescue Procedure
	F15.	Surveys will be undertaken for threatened bat species by a suitably qualified ecologist to identify any roosting bats prior to the demolition of the existing highway bridges. Any bats will be moved and relocated following consultation with DECCW.	Pre-construction and construction	Roads and Maritime QA Specification G36 Environmental Protection (Management System).	Not relevant to FAA's scope of work/scope of responsibility. Sancrox arrangements works does not include demolition works.

Outcome	Ref #	Commitment	Timing	Reference Document	CFFMP Reference
	F16	Development of a nest box strategy will be undertaken.	Pre-construction	<i>Roads and Maritime QA Specification G36 (Refer to section 6.10) Environmental Protection (Management System).</i>	Table 5-1 Mitigation Measure FF21 Appendix A Nest box strategy
	F17	Culverts and bridges identified in the Environmental Assessment as having a potential role in fauna crossing will be designed to facilitate fauna movements where feasible and reasonable.	Detailed design	<i>Roads and Maritime QA Specification G36 (Refer to section 6.10) Environmental Protection (Management System). Roads and Maritime QA Specification B30 - Clearing, Excavation & Backfill for Bridgeworks.</i>	Not relevant to FAA's scope of work/scope of responsibility. Sancrox Arrangement works does not include design works.
	F18	The feasibility of widening the median will be further investigated in consultation with DECCW during the detailed design.	Detailed design	<i>Roads and Maritime QA Specification G36 Environmental Protection (Management System).</i>	See Median Widening Assessment (SMEC Hyder JV) Not relevant to FAA's scope of work/scope of responsibility. Sancrox Arrangement works does not include design works.
Limit opportunities for animals to access the highway.	F19.	Fauna exclusion fencing (eg floppy-top fencing) will be erected along the Proposal at appropriate locations to direct fauna movement towards fauna crossing structures.	Pre-construction	<i>Roads and Maritime QA Specification G36 (Refer to section 6.10) Environmental Protection (Management System).</i>	Table 5-1 Mitigation Measure FF29 Stock proof fencing shall also be installed as per the contract for the Project (Sancrox) to protect minor roads.
Offset the residual impacts of the proposal on key habitat.	F20	An agreement will be developed in negotiation with Department of Planning and in consultation with DECCW for habitat offsets.	Pre-construction and construction	<i>Roads and Maritime QA Specification G36 Environmental Protection (Management System). Roads and Maritime Compensatory Habitat Policy and Guideline (draft).</i>	Biodiversity Offset Strategy (Roads and Maritime 2013)
Determine effectiveness of flora and fauna mitigation measures.	F21	A monitoring program will be developed to allow the effectiveness of mitigation and offset measures to be assessed and allow for their modification if necessary. The program will be for a minimum of 12 months after construction completion.	Pre-construction, construction and operation	<i>Roads and Maritime QA Specification G36 Environmental Protection (Management System).</i>	Table 5-1 Mitigation Measure FF5 Ecological Monitoring Program

3.4 EPBC Act Approval Conditions

The EPBC Act approval conditions relevant to this Plan are listed in **Table 3-3** below. A cross reference is also included to indicate where the condition is addressed in this Plan or other Project management documents. Where conditions are not specifically addressed in this Plan, the relevant document is referenced.

Table 3-3 EPBC Act Approval Conditions relevant to this CFFMP

Condition No.	Condition Requirements	Document Reference
CoA 2	To assist in mitigating the impacts of the proposal on the Koala, Grey-headed Flying-fox, Spotted-tail Quoll and the Giant-Barred Frog during construction, the person taking the action must prepare and submit a Flora and Fauna Management Plan for each stage of the action, for the Minister's written approval prior to commencement of each stage of the action. The Flora and Fauna Management Plan for each stage must be approved by the Minister in writing prior to commencement of the relevant stage. These plans must include:	
	a. Measures to be implemented to avoid, suppress and control the spread of weeds, plant pathogens and invasive species;	Table 5-1
	Measures to avoid and minimise other indirect impacts that may result from the proposal during and after construction, including erosion and sedimentation;	Table 5-1
	Measures to manage aquatic habitat on-site to at least maintain habitat values for the Giant Barred Frog;	Not identified in the Sancrox Project contract areas or areas of impact
	A detailed description of the pre-clearance surveys to be undertaken by a suitably qualified expert within all areas proposed for disturbance, including: hollow bearing trees, logs, existing culverts and bridges, no earlier than 48 hours prior to the removal of vegetation occurring in that area to ensure that the area is free of the Koala, Giant-Barred Frog, Grey-headed Flying-fox and Spotted-tail Quoll.	Table 5-1 Appendix F - Pre-clearing checklist
	Measures to relocate and/or ensure the appropriate care of individuals of the Koala, Giant-Barred Frog, Grey-headed Flying-fox and Spotted-tail Quoll that are identified during searches referred to in condition 2d; and	Table 5-1 Appendix H - Fauna Handling and Rescue Procedure
	Clear key milestones, monitoring, performance indicators, corrective actions and timeframes for the completion of all actions outlined in the plan.	Section 2 Table 5-1 Section 6

Condition No.	Condition Requirements	Document Reference
CoA 4	<p>Prior to commencement of stage 2 and stage 3 of the action, the person taking the action must submit an Ecological Monitoring Program for approval by the Minister that determines the effectiveness of the mitigation measures implemented as part of the project. The Ecological Monitoring Program must be approved in writing by the Minister prior to commencement of stage 2 and stage 3, and must include:</p> <ol style="list-style-type: none"> a. The baseline data collected from surveys undertaken by a suitably qualified expert on the Koala, Spotted-tail Quoll and Giant-Barred Frog within all habitat areas outside areas to be cleared of vegetation for the proposed action, that are likely to contain these species and that are likely to be adversely impacted by the action (as determined by a suitably qualified expert). The data must address the densities, distribution, habitat use and movement patterns of these species; b. The methodology to be implemented for the ongoing monitoring of road kill, the species densities, distribution, habitat use and movement patterns, and the use of fauna crossing during construction and operation of the action, including the timing, and duration of the methodology; c. Goals and performance indicators to measure the success of proposed fauna crossings, which must be specific, measureable, achievable, realistic and timely (SMART), and be compared against baseline data described in condition 4a) d. Details of contingency measures that would be implemented in the event of changes to densities, distribution, habitat use and movement patterns that are attributable to the construction or operation of the project. <p>Monitoring must continue until mitigation measures can be demonstrated to have been effective for the Koala, Spotted-tail Quoll, and Giant-Barred Frog.</p> <p>Should monitoring associated with this condition demonstrate that the use of fauna crossings and/or fencing is not achieving its intended purpose or is having a detrimental effect upon Koala, Spotted-tail Quoll, and Giant-Barred Frog (as determined by the Minister), the Minister may require that the person taking the action implement alternative forms of mitigation and/or corrective actions to address the relevant impacts to Koala, Spotted-tail Quoll, and Giant-Barred Frog. Such measures must be implemented as requested.</p>	Ecological Monitoring Program
CoA 5	To compensate for the loss of 240 hectares of threatened species habitat the person	Roads and Maritime will prepare a Biodiversity

Condition No.	Condition Requirements	Document Reference
	<p>taking the action must prepare and submit a Biodiversity Offset Management Plan (BOMP) for the Minister’s written approval within 6 months of commencement of the action. The BOMP must be approved in writing by the Minister within 6 months of commencement of the action. The BOMP must include:</p> <ul style="list-style-type: none"> a. the identification of the portions of the lands described as the “Proposed Biodiversity Offset Areas” in the Map at Schedule 1 of this notice that are necessary to achieve the outcomes required by the Environmental Offsets Policy 2012 (or subsequent published revisions). This must include offset attributes, shapefiles, textual descriptions and maps to clearly define the location and boundaries of the offset area(s); b. the results of targeted field surveys within the offset sites (undertaken at any ecologically appropriate time of the year) to assess and describe habitat suitability and presence / absence of individuals in relation to the Koala, Grey-headed Flying-fox, Spotted-tail Quoll and Giant Barred frog; c. an assessment of the baseline population for the Koala, Spotted-tail Quoll, Giant-Barred Frog, and Grey-headed Flying-fox which are detected within the offset area during field surveys; d. a description of the current quality (prior to any management activities) of the offset area(s) identified in Condition 5a with reference to the Koala, Spotted-tail Quoll, Giant-Barred Frog, and Grey-headed Flying-fox; e. an assessment demonstrating how the offset area(s) achieve the outcomes required by the Environmental Offsets Policy 2012 (or subsequent published revisions) and user guide; f. Should the offset sites identified in 5a not be sufficient to achieve the outcomes required by the Environmental Offsets Policy 2012 (or subsequent published revisions) and user guide, as determined in writing by the Minister, the person taking the action must provide further suitable offset sites and include these as part of the BOMP; g. information about the Koala, Grey-headed Flying-fox, Spotted-tail Quoll, Grey-headed Flying-fox, and Giant Barred frog (in relation to ecology, biology and conservation status) to inform appropriate management actions; h. targeted management actions, regeneration and revegetation strategies to be undertaken on the offset area(s) to improve the ecological quality of these areas 	<p>Offset Management Plan for the Project.</p>

Condition No.	Condition Requirements	Document Reference
	<p>for the Koala, Grey-headed Flying-fox, Spotted-tail Quoll and Giant Barred frog</p> <ul style="list-style-type: none"> i. clear performance objectives for management actions that will enable maintenance and enhancement of habitat within the offset area, as well as contribute to the better protection of individuals and / or populations of Koala, Spotted-tail Quoll, Giant-Barred Frog, and Grey-headed Flying-fox onsite; j. anticipated timeframes for achieving performance objectives. k. performance and completion criteria for evaluating the management of the offset area, including contingency actions, criteria for triggering contingency actions and a commitment to the implementation of these actions in the event that performance objectives are not met; l. a program to monitor and report on the effectiveness of these measures, and progress against the performance and completion criteria; m. details of who would be responsible for monitoring, reviewing, and implementing the BOMP. n. description of funding arrangements or agreements including work programs and responsible entities; <p>The approved BOMP must be published on the NSW Roads and Maritime Services internet web site, within 1 month of the BOMP being approved. The approved BOMP must be implemented.</p>	
CoA 8	<p>Within three months of every 12 month anniversary of the commencement of the action, the person taking the action must publish a report on their website addressing compliance with each of the conditions of this approval, including implementation of the BOMP, Flora and Fauna Management Plans and Ecological Monitoring Plan as specified in the conditions. Documentary evidence providing proof of the date of publication must be provided to the Department at the same time as the compliance report is published. Noncompliance with any of the conditions of this approval must be reported to the Department within 2 business days of becoming aware of the non-compliance. At any time within the life of this approval the Minister may agree, in writing, that further reporting is not required if compliance with all requirements has been demonstrated to the Minister's satisfaction.</p>	CEMP – Section 8.5
CoA 12	<p>If the person taking the action wishes to carry out any activity otherwise than in accordance with the BOMP, Ecological Monitoring Plan and Flora and Fauna</p>	Section 7.2

Condition No.	Condition Requirements	Document Reference
	<p>Management Plans as specified in the conditions, the person taking the action must submit to the Department for the Minister's written approval a revised version of that Plan. The varied activity shall not commence until the Minister has approved the varied Plan in writing. The Minister will not approve a varied Plan unless the revised Plan would result in an equivalent or improved environmental outcome over time. If the Minister approves the revised Plan, that Plan must be implemented in place of the Plan originally approved.</p>	

Refer to the Conditions of Approval, Department of Environment, Oxley Highway to Kempsey Pacific Highway Upgrade Project, New South Wales (EPBC 2012/6518). Dated the 24 of January 2013. Reference sections 130(1) and 133 of the Environmental protection and Biodiversity and Conservation Act 1999.

4 Environmental Aspects and Impacts

The following sections summarise existing flora and fauna within and adjacent to the Project area including species, communities and habitats. Identified impacts are then reviewed. The key reference documents are Chapter 15 of the EA and Volume 2 – Flora and Fauna Working Paper of the EA. The project boundary and relevant ecological data is shown on the sensitive area maps included in Appendix A6 of the CEMP.

4.1 Environmental aspects

4.1.1 Endangered Ecological Communities (EEC)

One EEC listed in NSW under the TSC Act has been located within the Project boundary and is listed below:

- Subtropical Coastal Floodplain Forest of the NSW North Coast Bioregion.

The location of this EEC in relation to the project is shown on the Sensitive Area Plan included at Appendix A6 of the CEMP and in Figure 4.1 below.

No Commonwealth EPBC Act listed endangered ecological communities (EEC) were identified in the Project area.



Figure 4.1 Subtropical Coastal Floodplain Forest of the NSW North Coast Bioregion location

4.1.2 Threatened plant species

Threatened flora species identified in the EA as having the potential to occur within the Project area, and their conservation status, are listed in Table 4-1. No threatened flora

species listed under the EPBC Act or the TSC Act were recorded in the study area during targeted field investigations conducted in 2005 to 2007.

Site specific ecological survey will be completed for the Sancrox Traffic Arrangement works prior commencing any construction and if this identifies the presence of any other threatened plant species, this CFFMP will be updated. Refer to Appendix J- Unexpected threatened species finds procedure.

Table 4-1 Threatened or otherwise significant plant species

Scientific name	Common name	EPBC Act	TSC Act	Relevance to the Project
<i>Acronychia littoralis</i>	Scented acronychia	Endangered	Endangered	These species are not identified in the EA as being present in the area of the Sancrox works, however this will be verified by the ecological survey before commencement of construction work.
<i>Arthraxon hispidus</i>	Hairy-joint Grass	Vulnerable	Vulnerable	
<i>Maundia triglochmoides</i>	Maundia	-	Vulnerable	
<i>Melaleuca biconvexa</i>	Biconvex Paperbark	Vulnerable	Vulnerable	
<i>Parsonsia dorrigoensis</i>	Milky Silkpod	Endangered	Vulnerable	
<i>Phaius australis</i>	Southern Swamp Orchid	Endangered	Endangered	
<i>Phaius tankervilleae</i>	Swamp Orchid	Endangered	Endangered	

The location of flora species identified in the project corridor are shown on the Sensitive Area Plans included at Appendix A6 of the CEMP

4.1.3 Fauna habitats

Key habitat elements identified within the study area include:

Table 4-2 Key habitat elements identified

Key habitat elements	Relevance to the Project
An array of flowering tree and shrub species within the forest, woodland and heathland communities, providing a constant supply of foraging resources for nectarivorous and insectivorous bird, bat and arboreal mammal species.	Identified in the EA.
Decorticated bark on paperbark trees, providing potential shelter sites for reptiles and microchiropteran bats.	Identified in the EA.
Paperbarks (<i>Melaleuca</i> sp.) and Swamp Mahogany within the Paperbark Swamp Forest and Swamp Mahogany / Forest Red Gum Swamp Forest stands, providing important autumn / winter foraging resources for nectar-eating birds, bats and arboreal mammals in the study area, including the threatened Grey-headed Flying Fox (<i>Pteropus poliocephalus</i>).	Identified in the EA.
Hollow-bearing trees of importance to hollow-dependent fauna species, including eight threatened species recorded in the study area (i.e. Eastern Freetail-bat (<i>Mormopterus norfolkensis</i>), Eastern False Pipistrelle (<i>Falsistrellus tasmaniensis</i>)[possible identification only], Southern Myotis (<i>Myotis macropus</i>), Greater Broad-nosed Bat (<i>Scoteanax ruepellii</i>) [probable identification only], Glossy Black Cockatoo (<i>Calyptorhynchus lathamii</i>), Masked Owl (<i>Tyto novaehollandiae</i>), Sooty Owl (<i>Tyto tenebricosa</i>) and Yellow-bellied Glider (<i>Petaurus australis</i>)).	Identified in the EA.
Preferred Koala feed trees and associated habitat	Identified in the EA.
Known foraging habitat for Glossy Black Cockatoo. Two species of preferred feed trees for this species, Black She-oak (<i>Allocasuarina littoralis</i>) and Forest Oak (<i>Allocasuarina torulosa</i>), occur in the study area and are common within the dry ridgetop forest community.	Identified in the EA.
Grass and sedge species, and dense groundcover within the Swamp Oak Forest and Paperbark Swamp Forest and Swamp Mahogany/Forest Red Gum Swamp Forest communities provide suitable foraging resources for granivorous and herbivorous fauna and a range of reptiles and frogs.	Not identified with the Project (Sancrox) Area
Areas of dense groundcover vegetation and soft substrate, providing suitable shelter and foraging habitat for a variety of small terrestrial mammals, including bandicoots and native mice and rats.	Identified in the EA.
Existing bridges and culverts provide roost sites for microchiropteran bats.	Not identified within the Sancrox project as part of the Microbat Management Strategy surveys
Artificial and natural water bodies provide foraging and breeding habitat for frogs and waterbirds as well as foraging habitat for the Southern Myotis (<i>Myotis macropus</i>).	Identified in the EA.

The fauna habitats in the Project study area were ranked as high, medium or low based on fauna habitat characteristics and evidence of fauna presence.

Refer to appendix L “fauna mapping” (that includes extracts from the Flora and Fauna Working Paper- Figures 8, 9 &10 that show Fauna Habitat Ranking, Fauna Corridor (that relates to Appendix A6 of the CEMP) and Threatened Fauna Recorded in the Study Area.

4.1.4 Threatened fauna

Threatened fauna species have been divided into those positively identified during the Oxley Highway to Kempsey Project survey and those not identified but considered highly likely to occur. The tables below 4.3 & 4.4 provide details of the species that shall be confirmed by the Sancrox Traffic Arrangement Project ecological survey. On completion of the Survey these tables shall be merged and updated according to the species confirmed as present. Refer to Appendix J- Unexpected threatened species finds procedure.

Table 4-3 Threatened fauna recorded in the study area during field surveys (Note that this table includes all the Oxley Highway to Kempsey Project of which the Project is a part- hence a further study shall be undertaken prior to clearing and grubbing to validate the threatened fauna.)

Common name	Scientific name	EPBC Act	TSC Act
Black-necked Stork	<i>Ephippiorhynchus asiaticus</i>	-	Endangered
Eastern Bentwing-bat	<i>Miniopterus schreibersii</i>	-	Vulnerable
Eastern False Pipistrelle	<i>Falsistrellus tasmaniensis</i>	-	Vulnerable
Eastern Freetail-bat	<i>Mormopterus norfolkensis</i>	-	Vulnerable
Giant Barred Frog	<i>Mixophyes iteratus</i>	Endangered	Endangered
Glossy Black-Cockatoo	<i>Calyptorhynchus lathami</i>	-	Vulnerable
Greater Broad-nosed Bat	<i>Scoteanax rueppellii</i>	-	Vulnerable
Green-thighed Frog	<i>Litoria brevipalmata</i>	-	Vulnerable
Grey-headed Flying-fox	<i>Pteropus poliocephalus</i>	Vulnerable	Vulnerable
Koala	<i>Phascolarctos cinereus</i>	Vulnerable	Vulnerable
Little Bentwing-bat	<i>Miniopterus australis</i>	-	Vulnerable
Little Eagle	<i>Hieraeetus morphnoides</i>	-	Vulnerable
Osprey	<i>Pandion haliaetus</i>	Migratory	Vulnerable
Rose-crowned Fruit-dove	<i>Ptilinopus regina</i>	-	Vulnerable
Sooty Owl	<i>Tyto tenebricosa</i>	-	Vulnerable
Southern Myotis	<i>Myotis macropus</i>	-	Vulnerable
Square-tailed Kite	<i>Lophoictinia isura</i>	-	Vulnerable
Yellow-bellied Glider	<i>Petaurus australis</i>	-	Vulnerable

~~XXX~~ species deleted as not identified in Sancrox Traffic Arrangement Project Areas

Table 4-4 Threatened fauna considered highly likely to occur in the study area however not specifically identified during the initial survey.

Common name	Scientific name	EPBC Act	TSC Act
Brush-tailed Phascogale	<i>Phascogale tapoatafa</i>	-	Vulnerable
Common Planigale	<i>Planigale maculate</i>	-	Vulnerable
Powerful Owl	<i>Ninox strenua</i>	-	Vulnerable
Spotted-tailed Quoll	<i>Dasyurus maculates</i>	Vulnerable	Vulnerable
Squirrel Glider	<i>Petaurus norfolcensis</i>	-	Vulnerable

4.1.5 Aquatic fauna

None of the species recorded in freshwater habitats during investigations for the EA were found within the Sancrox Traffic Arrangement Project. (Class 3 habitat only).

The fisheries habitat classification for each of the waterways in the Project area is provided in Table 4-5

Table 4-5 Fisheries habitat classifications

Waterway	Classification #	Description
Sancrox Project culvert at Approx Ch.2600	Culvert [3] or ford.	Named or unnamed waterway with intermittent flow and potential refuge, breeding or feeding areas for some aquatic fauna (e.g. fish, yabbies). Semi - permanent pools form within the waterway or adjacent wetlands after a rain event. Otherwise, any minor waterway that interconnects with wetlands or recognised aquatic habitats.

Classification in accordance with NSW DPI Fisheries Guidelines

4.2 Construction activities

Key aspects of the project that could result in impacts to terrestrial and aquatic flora and fauna include:

- Clearing of native vegetation (including habitat). The EA and subsequent studies identified approximately 240 hectares of native vegetation, of which 39 hectares are EEC for the whole Pacific Highway Upgrade – Oxley Highway to Kempsey. Stage 1 of the OH2Ku project has been allocated 7.95 of native vegetation clearing. Both Stage 1 and Stage 2 of have also been allocated 2ha for unforeseen temporary works activities in either stage.
- Works around and within watercourses.
- Disturbance of soils, consequential erosion and the mobilisation of sediment.
- Use of chemicals / fuels (potential for spills).

Refer also to the Aspects and Impacts Register included in Appendix A2 of the CEMP.

4.3 Ecological impacts

Likely and/or potential impacts associated with project are discussed in more detail in Chapter 15 of the EA and include:

- Loss of native vegetation including EEC.
- Loss of threatened flora species and their habitats.
- Loss of threatened fauna.
- Potential increase in the incidence of mortality of some native fauna, including threatened species.
- Fragmentation of habitats and wildlife corridors.
- Barrier effects on wildlife and riparian corridors (such as the erosion of genetic stock).
- Edge effects (such as weed invasion, pests and disease).
- Disturbance to aquatic and riparian habitats potentially resulting in contamination and siltation of waterways.
- Cumulative impacts in association with the Pacific Highway Upgrade Program as well as other development projects in the Mid-North Coast region.

Notwithstanding, mitigation and management measures provided in Table 5-1 aim to minimise the above likely and potential impacts on those threatened ecological communities and species identified in Section 4.1

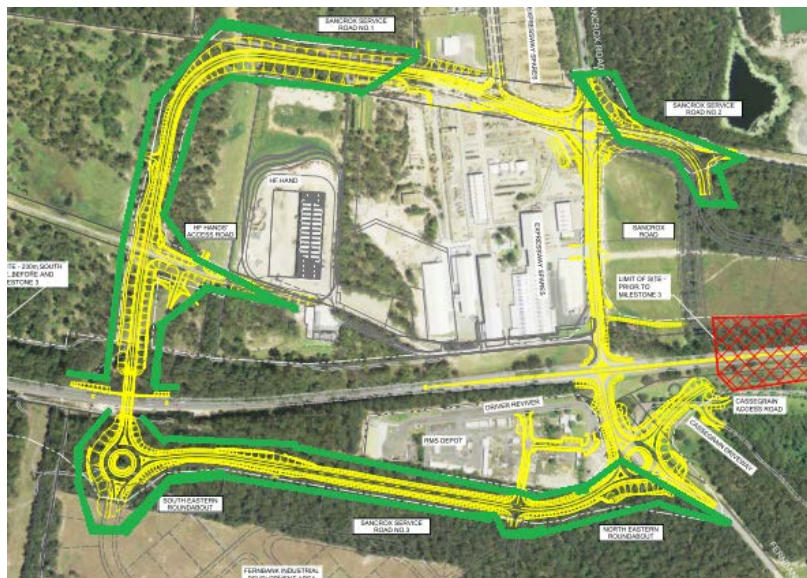


Figure 4.3 shows areas to be cleared highlighted in green

In the absence of appropriate mitigation measures, there is potential for significant impacts on those threatened entities identified as occurring with the Project corridor.

4.3.1 Pre-construction surveys

FAA will undertake the pre-construction ecological surveys to verify the construction boundaries/footprint of the project based on the detailed design. The survey methodology will include, but not necessarily be limited to:

1. Survey and installation of exclusion fencing around trees and threatened flora species that have been marked or otherwise identified for preservation;
2. Inspection by a suitably qualified expert / ecologist to identify threatened fauna and trees containing threatened fauna, survey for threatened flora, identification of locations for release of any fauna captured during the pre-clearing survey (in accordance with Appendix H), and identification of the species and locations of any weeds growing anywhere in the road reserve over the length to be cleared for the construction of the Project.
3. Marking of habitat trees with pink flagging tape and painting a pink cross at the base of the tree.
4. Identification and mapping of areas within and immediately adjacent to the site where declared noxious and environment weeds are present. This includes identifying mechanical, physical and chemical measures to control noxious and environmental weeds on the site in accordance with Appendix J.
5. Confirmation of locations of all identified items with GPS and update of sensitive area mapping where required.

The surveys shall include targeted surveys during suitable conditions for Koalas, within the vicinity of the project corridor and to validate the threatened species identified in Table 4.3.

These surveys will be completed at least 20 working days prior to the commencement of clearing and will be limited to the time required to satisfactorily complete these activities.

Sensitive area map (Appendix A6 of the CEMP) will be updated with the information from these surveys. Reference is also made to appendix L "Fauna mapping" (that includes extracts from the Flora and Fauna Working Paper- Figures 8, 9 & 10 that show Fauna Habitat Ranking, Fauna Corridor (that relates to Appendix A6 of the CEMP) and Threatened Fauna Recorded in the Study.

5 Environmental Mitigation and Management Measures

5.1 Flora and fauna mitigation and management measures

A range of environmental requirements and control measures are identified in the various environmental documents, including the EA, Statement of Commitments, Conditions of Approval and other Roads and Maritime documents and guidelines.

Specific measures and requirements to address impacts on flora and fauna are outlined in Table 5 1. Some soil and water mitigation and management measures specifically relevant to the protection of flora and fauna have also been reproduced and are denoted by the ID reference "SW". These mitigation and management measures are duplicated in the supporting Construction Soil and Water Management Plan that forms part of the overall environmental management system for the project. Note: any changes made to these mitigation measures need to be updated in the Construction Soil and Water Management Plan to avoid administrative non-compliance.

5.2 Biodiversity offsets

Biodiversity offsets are proposed as required by NSW Minister for the Environment CoA B.8 and B.9 and Commonwealth Minister for the Environment CoA 5. These are documented separately in the Biodiversity Offset Strategy (2013) and the Biodiversity Offset Package and Biodiversity Offset Management Plan (to be prepared by Roads and Maritime).

Table 5-1 Flora and fauna management and mitigation measures

ID	Measure / Requirement	Resources needed	When to implement	Responsibility	Reference
GENERAL					
FF1.	Training will be provided to all project personnel, including relevant sub-contractors on flora and fauna requirements from this plan through inductions, toolboxes and targeted training. Flora and fauna training requirements will be as per Section 6.2 of this plan.		Pre-construction	ESR	CoA B.31(b)(iii) G36 Sections 6.9 and 6.10 Appendix F – Pre-clearing Checklist Appendix G – Working Around Trees Guidelines Appendix H – Fauna Handling and Rescue Procedure Appendix I “Unexpected Threatened Species /EECs Procedure Appendix J – Weed and Plant Pathogen Management Plan
FF2.	Any works required outside the construction footprint verified in accordance with CoA B31(b)(i) will be referred to the Environment Manager for advice on further assessment and approval requirements in accordance with Section 7.2 of this plan and Section 3.7 of the CEMP. All construction activities that require the clearing of native vegetation shall comply with the requirements of the Department of the Environment Condition of Approval 1.		Construction – prior to any related works commencing	Site Engineer ESR	CoA B31(b)(i) G36 Section 6.9 DoTE CoA 12
FF3.	In the event that threatened species or EECs are unexpectedly identified during construction the Unexpected Threatened Species /EECs Procedure will be followed.		Construction	ESR Site Engineer	CoA B31(b)(viii) Appendix I of this CFFMP
FF4.	A Project ecologist / suitably qualified expert will be appointed prior to the commencement of construction.		Pre-construction	Q & E Manager/ESR	B31(b)(iii)

FF5.	The Ecological Monitoring Program will be implemented.	Ecological survey	Construction Operation	Q & E Manager/ESR	CoA B10 SoC F21 DoTE CoA 2 Clause 4.3.1 of this CFFMP Appendix H – Fauna Handling and Rescue Procedure Appendix I “Unexpected Threatened Species /EECs Procedure
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VEGETATION CLEARING, PROTECTION AND MANAGEMENT

FF6.	The limits of clearing are to be clearly marked on all relevant work plans and protective fencing to mark these limits (ie ‘no-go’ areas) surrounding the construction footprint installed prior to vegetation clearing activities occurring. The limits of clearing will be marked in accordance with Guide 2 of the Roads and Maritime <i>Biodiversity Guidelines</i> .	Roads and Maritime Biodiversity Guidelines Roads and Maritime Practice Note: Clearing and Fauna Management – Pacific Highway Projects (May 2012)	Pre-Construction Then daily inspection during clearing and grubbing and weekly thereafter	Site Engineer ESR/Supervisor	EA SoC F2 CoA B31(b)(iii) G36 Section 6.9 G40 Section 2.4 DoTE CoA 2b and 2c
FF7.	Prior to vegetation clearing, a suitably qualified ecologist will survey all areas to be cleared and will mark out any areas of significant vegetation (EECs, threatened species,) to be fenced and protected, in accordance with the methodology outlined in Section 4.3.1. Areas of weed infestation will also be identified and documented. These works will be limited to the time required to satisfactorily complete these activities.		Pre-Construction	ESR Project Ecologist	CoA B31(b)(iii) DoTE CoA 2d <i>Appendix F: “Pre clearing checklist”</i>
FF8.	Seed will be collected from all areas of native vegetation to be cleared from the construction footprint prior to and during clearing and seed will be stored for use in revegetation works where feasible. Where sufficient seed cannot be collected from the alignment, local native seed would be purchased for landscaping. Seed will be stored in a cool, dry, vermin proof, air conditioned storage area at a temperature suitable to minimise deterioration of the seed		Pre-Construction	ESR Project Ecologist	CoA B31(b)(iii)
FF9.	Native vegetation cleared from the construction footprint will be mulched and used along with retained topsoil for reuse in rehabilitation works and erosion control. Mulch and topsoil will not be stockpiled in ‘no-go’ areas and cleared vegetation will not be pushed into ‘no-go’ areas.	Roads and Maritime Environmental Direction No.25 – Management of Tannins from Vegetation Mulch	Construction	Site Engineer ESR/ Supervisor	EA CoA B31(b)(iii) SoC F5 Refer to CSWMP

<p>FF10. Revegetation/rehabilitation of all areas disturbed as part of the Project that do not form part of permanent pavement or structures will be undertaken progressively during and following construction to maintain and enhance habitat, particularly in identified regional corridors and key habitat areas. Native revegetation and rehabilitation will be conducted between Ch. 140 – 900.</p> <p>Revegetation/rehabilitation would meet the following milestones:</p> <ul style="list-style-type: none"> • On slopes 3:1 or flatter where earthworks requiring revegetation have been completed over an area exceeding one hectare, revegetation will be carried out within 14 days. • On slopes steeper than 3:1 where earthworks requiring revegetation have been completed over an area exceeding one hectare, revegetation will be carried out within 7 days. • Open drains will be revegetated within 7 days of excavation. <p>Soil and erosion controls for any area will remain in place for six months or until 70% vegetation cover is achieved within the catchment of the controls.</p> <p>Non-compliance with these milestones would be addressed in accordance with the processes outlined in Section 8.6 of the CEMP.</p> <p>Completion of all landscaping works is a requirement of construction completion, currently scheduled to be 80 weeks after the commencement of the contract. This timeframe is subject to construction delays due to weather and other unforeseen construction difficulties.</p>	Construction	Site Engineer	G36 Clause 6.9 EA CoA B31 (b)(iii) SoC F5
<p>FF11. Native and locally indigenous plants are to be used in the landscaping and revegetation areas.</p>	Construction	Site Engineer ESR	EA SoC F5 Project landscape drawings
<p>FF12. Revegetation works will include planting of preferred food trees for native fauna, including appropriate eucalypt species for the Koala, Allocasuarina spp. for the Glossy Black-cockatoo, and winter flowering trees for birds and arboreal mammals.</p>	Construction	ESR	EA DoTE CoA 2b Refer landscape drawings This CFFMP
<p>FF13. Weeds will be managed in accordance with the Weed Management Plan.</p>	Construction	Site Engineer ESR	EA G36 Section 6.9 CoA B31(b)(iii) SoC F8 Appendix J - Weed and Plant Pathogen Management Plan DoTE CoA 2a

THREATENED FLORA

FF14.	Any threatened plants identified within and immediately adjacent to the limits of clearing will be located and tagged. Threatened plants in proximity to the footprint that are to be retained are to be fenced during construction and identified to construction workers during site induction.	<i>Roads and Maritime Environmental Direction No.25 – Management of Tannins from Vegetation Mulch</i>	Pre-Construction	ESR	EA SoC F9 DoTE CoA 2b EWMS – Clearing and grubbing Appendix 3 – procedure for protecting threatened flora species and trees marked for preservation
FF15.	If reasonable and feasible, threatened plant species that are to be directly impacted will be translocated to suitable habitat prior to vegetation clearing in consultation with EPA.		Pre-Construction	Project Ecologist ESR	EA SoC F10
FF16.	<i>Not Applicable</i>				
FF17.	<i>Not Applicable</i>				

THREATENED FAUNA

FF18.	<i>Not Applicable</i>				
FF19.	<i>Not Applicable</i>				
FF20.	<i>Not Applicable</i>				
FF21.	The Nest Box Plan will be implemented.		Pre-Construction	ESR	EA CoA B7 SoC F16 Appendix A – Nest Box Plan

WILDLIFE PROTECTION

FF22.	Should clearing activities coincide with the Koala breeding season (September to February), specific measures identified in the Pre-clearing checklist/Fauna Handling and Rescue Procedure will be followed.		Pre-Construction Construction	Site Engineer ESR, Supervisor	EA CoA B31(b)(iii) Appendix F of this CFFMP Appendix I of this CFFMP DoTE CoA 2e
FF23.	<i>Not Applicable</i>				

FF24.	A suitably qualified expert will undertake preclearance surveys for native fauna immediately prior to clearing activities. Searches will be undertaken on nests, hollow bearing trees, logs, existing culverts and bridges. Searches will take place no earlier than 48 hours prior to the removal of vegetation occurring in that area to ensure that the area is free of the Koala, Grey-headed Flying-fox, Spotted-tail Quoll and other hollow dwelling species.	Roads and Maritime Practice Note: Clearing and Fauna Management – Pacific Highway Projects (May 2012)	Pre-Construction Construction	Project Ecologist	EA CoA B31(b)(i) Appendix H of this CFFMP DoTE CoA 2d
FF25.	<i>Not Applicable</i>				
FF26.	During the proposed clearing works, the Project Ecologist/suitably qualified expert or an experienced wildlife handler under the supervision of the Project Ecologist will be present to retrieve and provide appropriate care of any displaced fauna and release the fauna into adjacent habitats safe from construction work.		Construction	Site Engineer, ESR, Supervisor, Project Ecologist	CoA B31(b)(i) DoTE CoA 2d and 2e Refer to Appendix H “Fauna Handling and Rescue Procedure”
FF27.	Clearing will be undertaken in accordance with the process described in Guide 4 of the Roads and Maritime Biodiversity Guidelines. A two-stage clearing process will be implemented in all areas supporting identified fauna habitat such as hollow bearing trees, habitat trees and bushrock. <ul style="list-style-type: none"> Non-habitat trees will be removed before habitat trees, allowing fauna an opportunity to move from the habitat trees. Habitat trees will be left overnight from the time of the felling of the non-habitat trees nearby; and Felled (habitat) trees will be left for a short period of time (ie at least one hour) on the ground, to give any fauna remaining in the trees an opportunity to escape before further processing of the trees occurs. The Project Ecologist/suitably qualified expert or wildlife handler will inspect the felled trees for resident species or injured wildlife. These will then be treated or relocated. 	Roads and Maritime Biodiversity Guidelines Roads and Maritime Practice Note: Clearing and Fauna Management – Pacific Highway Projects (May 2012)	Construction	ESR, Supervisor Project Ecologist	EA CoA B31(b)(iii) DoTE CoA 2d
FF28.	Contact details for local NPWS officers, FAWNA, RSPCA, the Port Macquarie Koala Hospital and local veterinary hospitals will be maintained and kept at a convenient location on the Construction Site and must be available to the relevant management and supervisory personnel at all locations where clearing is being undertaken, to enable quick contact in the event of a fauna rescue.		Construction	Site Engineer, Supervisor, ESR Project Ecologist	SoC F14 DoTE CoA 2e
FF29.	Fauna exclusion fencing (e.g. floppy-top fencing) will be erected at locations identified in Schedule 3 of the Department of the Environment approval. Where fencing is installed after traffic is diverted onto the new Pacific Highway, but prior to construction completion, the fencing shall be monitored weekly. In the operational phase of the project, fauna fence is routinely inspected as part of general road maintenance asset inspection every three months.		Construction Operation (No fauna fencing identified in Sancrox Traffic Arrangement Project)	Site Engineer, Supervisor, ESR	EA SoC F19 DoTE CoA 3

FAUNA HABITATS AND CONNECTIVITY

FF30.	Habitat features and resources for native fauna (such as hollow logs and bush rocks) will be distributed along the route of the Project where feasible and reasonable. Such relocation will be undertaken so as to limit damage to existing vegetation and would not occur in good condition remnant vegetation. This measure will be implemented consistent with Guide 5 of the Roads and Maritime Biodiversity Guidelines.	Roads and Maritime Biodiversity Guidelines	Construction	Site Engineer ESR	EA SoC F4 DoTE CoA 3
FF31.	The fauna connectivity measures outlined in the Department of the Environment Condition of Approval 3 shall be implemented.		Construction	Site Engineer, Supervisor, ESR	CoA B1, B2, B3, B4, B5 DoTE CoA 3
AQUATIC HABITATS					
FF32.	Permanent water quality control measures will be installed as early as possible in the construction program and at least prior to construction completion, currently scheduled to be 80 weeks after the commencement of the contract. This timeframe is subject to construction delays due to weather and other unforeseen construction difficulties. Temporary controls will be installed in accordance with SW25.		Construction	Site Engineer	SoC F7 DoTE CoA 2b
FF33.	Waterways will be protected from sediment impacts during construction, in accordance with the SWMP mitigation measures included below (denoted by the 'SW' ID reference). Measures designed specifically to protect aquatic flora and fauna may include: Construction of temporary diversions.		Construction	Supervisor, Site Engineer-ESR	DoTE CoA 2b
FF34.	<i>Not Applicable</i>				
FF35.	Existing trees, grasses and ground cover will be retained within 15 metres of watercourses until immediately before construction commences in that area (ie 48 hours). All trees in these areas will be felled manually, leaving grasses and small understory species wherever possible.		Construction	Site Engineer, Supervisor, ESR	G40 Clause 2.4 Note Class 3 Waterway only located in Sancrox Project area
FF36.	<i>Not Applicable</i>				
SW1	The potential for erosion during the construction of the Project will be appropriately managed in accordance with the measures contained within Managing Urban Stormwater: Soils and Construction Volume 1 (Landcom 2004) and Managing Urban Stormwater: Soils and Construction Volume 2D, Main Road Construction (DECC 2008b).		Pre-construction Construction	Site Engineer/ESR	G38 Good practice EA 20.3.4 CoA C17 CoA 2b, CoA 2c

SW10	<p>The following EWMS will be prepared and implemented to manage soil and water impacts. EWMS for activities identified as having high environmental risk will undergo a period of consultation with EPA and DPI Fishing and Aquaculture. The EWMS is to provide detailed guidance on construction methodologies, with the input of construction personnel, to meet the requirements of the FFMP, specifically they detail the controls to be implemented, responsibilities, location and timing and detail on how to implement. Those marked with an asterisk below are those likely to be subject to consultation:</p> <ul style="list-style-type: none"> • Temporary waterway crossings. • Site compound establishment. • Public road accesses and managing mud tracking. • Clearing and grubbing. • Sediment basin design, construction and management*. • Dewatering*. • Piling. <p>Where in stream works are to take place, specific work method statements will be developed in consultation with relevant government agencies.</p>	Pre- construction Construction	Supervisors/ESR	G38 SoC SGW4 CoA 2b
SW17	Works will be programmed to minimise the extent and duration of disturbance to vegetation.	Pre- construction Construction	Site Engineer/Site Supervisor	G38 SoC VAD4 and F5 CoA 2b
SW25	Catch drains, contour and diversion drains across exposed areas will be installed within 24 hours and prior to forecast rain events following clearing, and re-established and maintained during topsoil removal and earthwork operations.	Construction	Supervisors	G38 CoA 2b
SW28	Erosion and sediment control structures will remain installed and maintained until sufficient vegetative cover is achieved (ie for a period of up to six months or until vegetation cover achieves 70%).	Construction	Supervisors	CoA 2c Good practice
SW34	<i>Not Applicable</i>			

SW35	<p>Where temporary crossings are required, these will be designed, constructed and maintained in accordance with Managing Urban Stormwater Soils and Construction Volumes 2A and 2D Main Road Construction (DECC 2008) and section 5.3.4 of the guideline Managing Urban Stormwater 4th edition March 2004, Volume 1 Soils and Construction and subject to the preparation of an EWMS identified in SW10 and SW34. Temporary crossings will:</p> <ul style="list-style-type: none"> • Be 'fish friendly' with a lower section of the temporary crossing provided to act as an emergency spillway. • Be used for the shortest time required to complete their designed operational function and affected riparian vegetation will be rehabilitated as soon as possible to existing or better condition. • Use material that will not result in fine sediment material entering the waterway. <p>Where rock crossings are used, the rock will be of suitable size to prevent/reduce the likelihood of the material being washed away in a storm or flood event, with large sized rock on the lower side of crossings where water velocity increases.</p>	Construction	ESR/Site Engineer/Supervisors	G36 CoA B31d (iii) SoC F17 CoA 2b and 2c
SW36	Scour protection will be installed at the base of permanent and temporary drainage outlets, and will be integrated where feasible into current banks to minimise impacts.	Construction	Project Manager/Site Engineer	G36 G38 CoA B21c SoC SGW8 CoA 2b and 2c
SW37	Drainage works will be stabilised against erosion by appropriate selection of channel dimensions, slope and lining, and the inclusion, if necessary, of drop structures and energy dissipaters.	Construction	Project Manager/Site Engineer	G38 CoA B21c CoA 2b
SW38	Culverts and permanent stream protection measures will be installed as early as possible in the construction program to facilitate transverse drainage during the early stages of construction.	Construction	Supervisors	G38 SoC F7 CoA 2b
SW45	A number of temporary sedimentation basins for construction phase, will be converted to provide operational phase water quality management.	Construction	Project Manager/Site Engineer	EA 6.4.15, 13.4.1 CoA 2b
SW50	Sediment basins will be retained for a minimum of six months or until a 70% vegetative cover is achieved in its catchment; other satisfactory controls are in place and approved by the EM or the basin is otherwise redundant.	Construction/post construction	Project Manager/Site Engineer	Good practice CoA 2b
SW65	Erosion and sediment controls will be inspected at least daily (with maintenance and/or modifications made as necessary). Inspections and/or maintenance during wet-weather maybe increased where necessary.	Construction	Supervisors	SoC GS1 Good practice CoA 2b

SW66	A Project soil conservation specialist will inspect the work areas, assess drainage and riparian conditions, prepare erosion and sediment control plans and provide advice to the Project team to maintain a high standard of erosion and sediment practices on site. Inspections will be undertaken typically on a fortnightly basis, or as required where high-risk activities are proposed, or where sensitive areas have the potential to be affected eg SEPP 14 wetland, heritage sites.		Pre-construction/Construction	Soil Conservation Specialist ESR	Good practice SoC GS1 CoA 2b
SW67	Watercourse bed and banks to be monitored weekly and post rainfall during construction for indications of instability. Attention to monitoring for channel erosion will be completed during and following higher than normal flow conditions. Protection measures will be installed should increase intensity or erosion be identified. Where increased intensity or erosion is identified that may have an impact on EPBC species or their habitat, these will be rectified within 5 days. If there is an immediate risk of impact on EPBC Act listed species, temporary rectification works will occur within 1 day.		Pre-construction/Construction	Soil Conservation Specialist ESR	EA 12.4.4 CoA B30e(ii) CoA 2b
PESTS AND DISEASES					
FF37.	Washing procedures will be implemented to ensure that insect pests and their eggs/larvae are not present on equipment. The washing procedure will be undertaken in accordance with the process described in Guide 7 of the Roads and Maritime Biodiversity Guidelines.	Roads and Maritime Biodiversity Guidelines	Construction	Site Engineer, Supervisor, ESR	EA Appendix J of this CFFMP DoTE CoA 2a
FF38.	The spread of bacteria, viruses and diseases such as <i>Phytophthora cinnamomi</i> , amphibian chytrid fungus and beak and feather disease will be addressed through washing of equipment. The washing procedure will be undertaken in accordance with the process described in Guide 7 of the Roads and Maritime Biodiversity Guidelines.	Roads and Maritime Biodiversity Guidelines	Construction	Site Engineer, Supervisor, ESR	EA CoA B31(b)(iii) Appendix J of this CFFMP DoTE CoA 2a

6 Compliance management

6.1 Roles and responsibilities

The Project Team's organisational structure and overall roles and responsibilities are outlined in Section 4.2 of the CEMP. Specific responsibilities for the implementation of environmental (flora/fauna) controls are detailed in Chapter 5 of this Plan.

6.2 Training

All employees, contractors and utility staff working on site will undergo site induction training relating to flora and fauna management issues. The induction training will address elements related to flora and fauna management including:

- Existence and requirements of this sub-plan.
- Relevant legislation.
- Specific species likely to be affected by the construction works and how these species can be recognised.
- Mulch stockpile location and management measures.
- Fauna rescue requirements.
- Weed control measures.
- General flora and fauna management measures.
- Specific responsibilities for the protection of flora and fauna.
- The requirements of the Department of the Environment approval and the management measures to be implemented to comply with this approval.

Further details regarding staff induction and training are outlined in Section 5 of the CEMP.

6.3 Inspections and Monitoring

Inspections of sensitive areas and activities with the potential to impact flora and fauna will occur for the duration of the project.

Requirements and responsibilities in relation to inspections are documented in Section 8 of the CEMP and in the Ecological Monitoring Program.

6.4 Auditing

Audits (both internal and external) will be undertaken to assess the effectiveness of environmental controls, compliance with this sub plan, Roads and Maritime Specifications and other relevant approvals, licenses and guidelines.

Audit requirements are detailed in Section 8.3 of the CEMP.

Any corrective actions or opportunities for improvement will be dealt with through the process outlined in Section 8.6 of the CEMP.

6.5 Reporting

Reporting requirements and responsibilities are documented in Section 8.4 of the CEMP.

An Ecological Monitoring Program (as required by CoA B10) will assess and report on the effectiveness of mitigation measures implemented as part of the larger project.

7 Review and improvement

7.1 Continuous improvement

Continuous improvement of this plan will be achieved by the ongoing evaluation of environmental management performance against environmental policies, objectives and targets for the purpose of identifying opportunities for improvement. This will be achieved through the process documented in Section 9 of the CEMP.

The continuous improvement process will be designed to:

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

7.2 CFFMP update and amendment

The processes described in Section 10.2 of the CEMP may result in the need to update or revise this Plan. This will occur as needed.

Any revisions to the CFFMP will be in accordance with the process outlined in Section 1.6 of the CEMP. Where such revisions do not have an equal or better outcome for Koala, Grey-headed Flying-fox, Spotted-tail Quoll and the Giant-Barred Frog, the plan will be provided to the Minister for the Environment for written approval prior to implementation of those changes.

A copy of the updated plan and changes will be distributed to all relevant stakeholders in accordance with the approved document control procedure as per Section 10 of the CEMP.

Appendix A. Nest Box Plan

Appendix B. Not Included

Appendix C. Not Included

Appendix D. Not Included

Appendix E. Not Included

Appendix F. Pre-clearing check list

Appendix G. Working Around Trees Guideline

Appendix H. Fauna Handling and Rescue Procedure

Appendix I. Unexpected Threatened Species / EECs Procedure

Appendix J. Weed and Plant Pathogen Management Plan

Appendix K. Sancrox Project Study Areas



Figure 1 Sancrox Project Study Area (1)



Figure 2 Sancrox Project Study Area (2)

Appendix L. Fauna mapping

Figure 8 Fauna habitat ranking

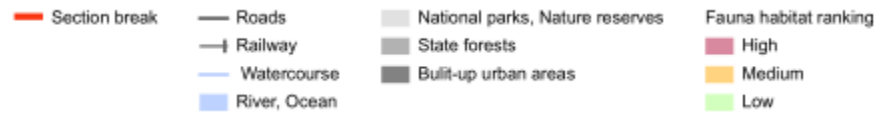
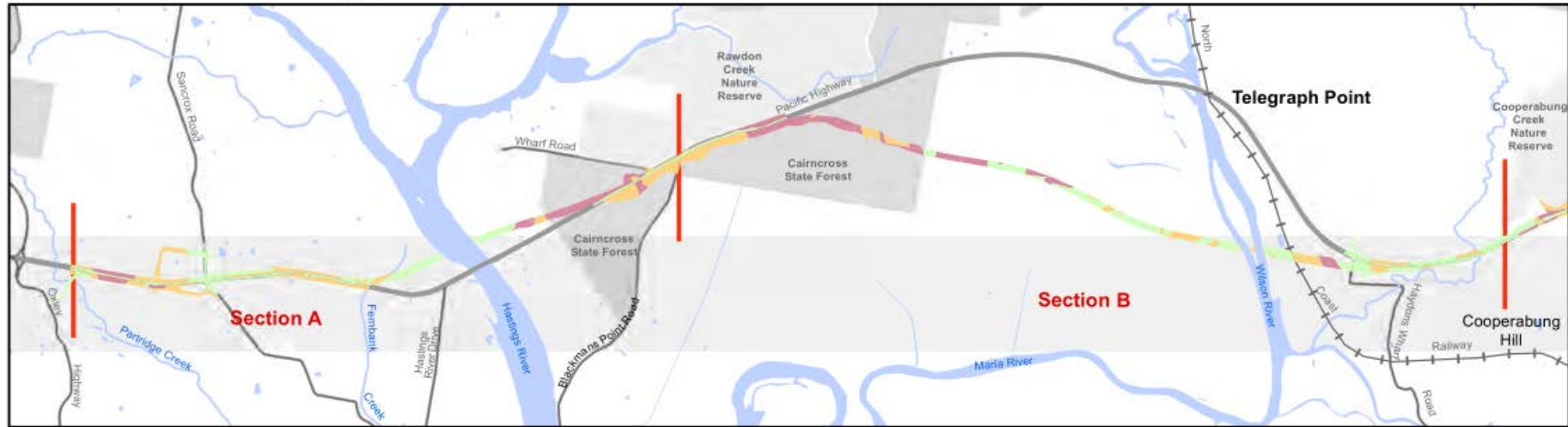
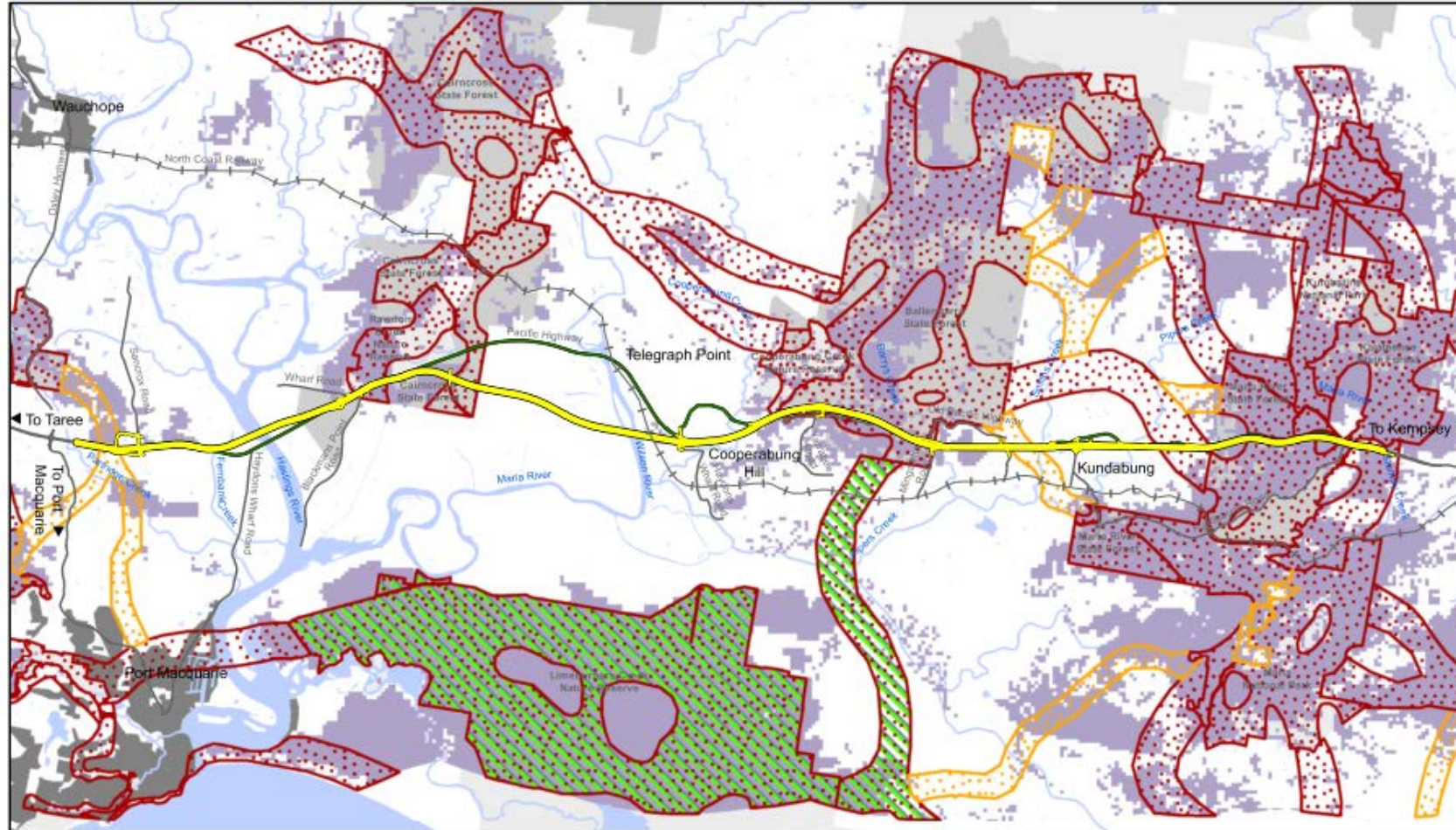
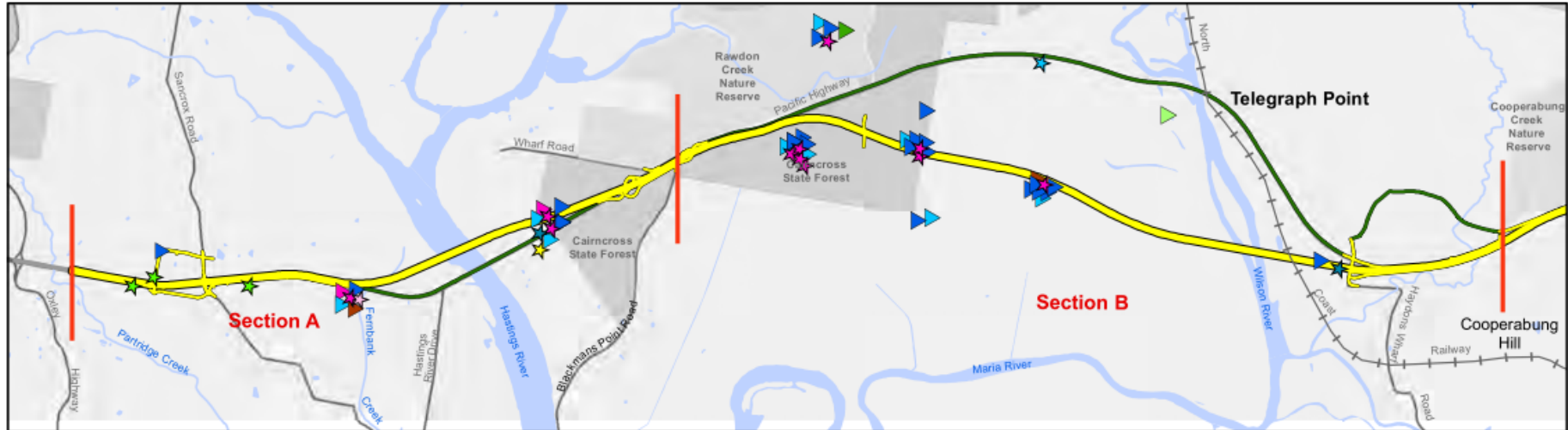


Figure 9 Wildlife corridors and key habitats in the study locality



- | | | | | |
|-------------------------------------|----------------|-----------------------------------|-------------------------------|------------------------------------------------------------|
| The Proposal | — Roads | □ National parks, Nature reserves | 📦 Key corridors - regional | 🌿 Limeburners Linkage climate change corridor (DECCW 2009) |
| 🛣️ Upgraded Highway | 🚊 Railway | ▒ State forests | 📦 Key corridors - subregional | |
| 🛤️ Service Road (existing facility) | 🌊 Watercourse | ■ Built-up urban areas | 🏠 Key habitats | |
| | 🌊 River, Ocean | | | |

Figure 10 Threatened fauna recorded in the study area during surveys



- | | | | | | | | |
|-------------------------------------|----------------|-----------------------------------|---------------------------|-----------------------------|------------------------|--------------|-------------------------|
| The Proposal | — Roads | □ National parks, Nature reserves | ▲ Black-necked Stork | ▲ Eastern False Pipistrelle | ▲ Green-thighed Frog | ★ Masked Owl | ★ Yellow-Bellied Glider |
| 🛣️ Upgraded Highway | 🚊 Railway | ▒ State forests | ▲ East-coast Freetail-bat | ▲ Glossy-Black Cockatoo | ★ Little Bent-wing Bat | ★ Koala | ▲ Glossy-Black Cockatoo |
| 🛤️ Service Road (existing facility) | 🌊 Watercourse | ■ Built-up urban areas | ▲ Eastern Bent-wing Bat | ▲ Greater Broad-nosed Bat | ★ Southern Myotis | ★ Osprey | ★ Yellow-Bellied Glider |
| 🛑 Section break | 🌊 River, Ocean | | ▲ Giant Barred Frog | ▲ Grey-headed Flying-fox | ★ Square-tailed Kite | ★ Sooty Owl | |