

# CONSERVATION AGREEMENT

Conservation Agreement for the  
protection and conservation of  
Lowland rainforest of subtropical  
Australia at Palmview, Queensland

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Minister for the Environment and Energy on  
behalf of the Commonwealth of Australia

The State of Queensland (represented by the  
Department of Transport and Main Roads and  
the Department of Natural Resources, Mines  
and Energy)

Sunshine Coast Regional Council

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# Details

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## Parties

1. Minister for the Environment and Energy (**Minister**) on behalf of the Commonwealth (**Commonwealth**)
2. Sunshine Coast Regional Council (**Council**)
3. The State of Queensland (represented by Department of Transport and Main Roads (**TMR**) and the Department of Natural Resources, Mines and Energy (**NRME**))

## Recitals

- A. Section 305(1) of the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (**EPBC Act**) provides that the Minister may, on behalf of the Commonwealth, enter into a conservation agreement for the protection and conservation of biodiversity in the Australian jurisdiction.
- B. Pursuant to Section 305(1A) of the EPBC Act, the purpose of this Agreement is to:
  - (a) legally secure and implement the offset of 16.64 hectares of Lowland Rainforest of Subtropical Australia at Palmview, Queensland, in accordance with Condition 2(b) and Attachment B of the conditions of approval for EPBC 2015/7464 and, in doing so;
  - (b) protect and improve the condition of Lowland Rainforest of Subtropical Australia and, by 8 December 2026, ensure the offset of 16.64 hectares of Lowland Rainforest of Subtropical Australia meets the following condition thresholds;
    - i. at least 70 per cent of canopy vegetation is native vegetation;
    - ii. the Offset Area contains 30 native woody species from the Lowland Rainforest of Subtropical Australia threatened ecological community listing advice<sup>1</sup>; and
    - iii. at least 70 per cent of total vegetation cover is native vegetation.
- C. The Minister, on behalf of the Commonwealth, has agreed to enter into this Agreement with the **Council** and the State of Queensland (as represented by **TMR** and **NRME**) under section 305(1) of the EPBC Act to give effect to the purpose described in Recital B.
- D. For the purposes of section 305(2) of the EPBC Act, the Minister is satisfied that:
  - (a) the implementation of this Agreement will result in a net benefit to the conservation of biodiversity; and
  - (b) this Agreement is not inconsistent with any recovery plan, threat abatement plan or wildlife conservation plan.
- E. Pursuant to section 307 of the EPBC Act, this Agreement is binding on the Commonwealth and the **Council** and the State of Queensland (as represented by **TMR** and **NRME**).

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<sup>1</sup> Appendix A of the TSSC (2011a) Commonwealth Listing Advice on Lowland Rainforest of Subtropical Australia  
<http://www.environment.gov.au/biodiversity/threatened/communities/pubs/101-listing-advice.pdf>.

# Agreed terms

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## 1. Definitions and interpretation

### 1.1 Definitions

In this Agreement, except where the contrary intention is expressed, terms have the meaning they are given in the EPBC Act and otherwise the following definitions are used:

|                                                    |                                                                                                                                                                                                                                                                             |
|----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Activity</b>                                    | The actions specified in clauses 4.3(a), (b) and (c) (Activity Particulars).                                                                                                                                                                                                |
| <b>Activity Objective</b>                          | has the meaning given in clause 4.2.                                                                                                                                                                                                                                        |
| <b>Agreement</b>                                   | this agreement between the Minister, the <b>Council</b> , and the State of Queensland (as represented by <b>TMR</b> and <b>NRME</b> ) including its Schedules, as amended from time to time in accordance with section 308 of the EPBC Act or clause 6.3 of this Agreement. |
| <b>Agreement Details</b>                           | Schedule 1 of this Agreement.                                                                                                                                                                                                                                               |
| <b>Business Day</b>                                | in relation to the doing of any action in a place, any day other than a Saturday, Sunday or public holiday in that place.                                                                                                                                                   |
| <b>Commonwealth</b>                                | the Commonwealth of Australia.                                                                                                                                                                                                                                              |
| <b>Council</b>                                     | the Sunshine Coast Regional Council.                                                                                                                                                                                                                                        |
| <b>Department</b>                                  | the Commonwealth agency responsible for administering the EPBC Act, currently the Department of the Environment and Energy.                                                                                                                                                 |
| <b>EPBC Act</b>                                    | <i>The Environment Protection and Biodiversity Conservation Act 1999</i> (Cth)                                                                                                                                                                                              |
| <b>EPBC 2015/7464</b>                              | The action described as Bruce Highway Upgrade, Caloundra Road to Sunshine Motorway, Queensland (EPBC 2015/7464) that was approved on 2 September 2016 under sections 130 and 133 of the EPBC Act (Annexure 2).                                                              |
| <b>Lowland Rainforest of Subtropical Australia</b> | The Lowland Rainforest of Subtropical Australia ecological community listed as critically endangered under the EPBC Act.                                                                                                                                                    |
| <b>Offset Agreement</b>                            | the offset agreement between TMR and Council dated 1 June 2017 and annexed in Annexure 3.                                                                                                                                                                                   |
| <b>Offset Area</b>                                 | the area identified in Attachment B of the conditions of approval for EPBC 2015/7464 and shown as the offset area identified in Annexure 1 to this Agreement                                                                                                                |
| <b>Minister</b>                                    | the Minister administering the EPBC Act or a delegate of the Minister pursuant to section 515(1) of the EPBC Act.                                                                                                                                                           |
| <b>Protected Matter</b>                            | The Lowland Rainforest of Subtropical Australia ecological community listed as critically endangered under the EPBC Act                                                                                                                                                     |

|             |                                                                                             |
|-------------|---------------------------------------------------------------------------------------------|
| <b>NRME</b> | The Department of Natural Resources, Mines and Energy, representing the State of Queensland |
| <b>TMR</b>  | The Department of Transport and Main Roads, representing the State of Queensland            |

## 1.2 Interpretation

In this Agreement, except where the contrary intention is expressed:

- (a) the singular includes the plural and vice versa, and a gender includes other genders;
- (b) another grammatical form of a defined word or expression has a corresponding meaning;
- (c) the meaning of general words is not limited by specific examples introduced by meaning of, for example or similar expressions;
- (d) a reference to a clause, paragraph, Schedule or Annexure is to a clause or paragraph of, or Schedule or Annexure to, this Agreement;
- (e) a reference to a document or instrument includes the document or instrument as novated, altered, supplemented or replaced from time to time;
- (f) a reference to time is to the time in the place where the obligation is to be performed;
- (g) a reference to a party is to a party to this Agreement and includes the party's executors, administrators, successors and permitted assignees and substitutes;
- (h) a reference to a person includes a natural person, partnership, body corporate, association, governmental or local authority or agency or other entity; and
- (i) a reference to a statute, ordinance, code or other law includes regulations and other instruments under it and consolidations, amendments, re-enactments or replacements of any of them; and
- (j) a rule of construction does not apply to the disadvantage of a party because the party was responsible for the preparation of this Agreement or any part of it.

## 2. Agreement Period

- (a) This Agreement commences on the date of execution by the last party.
- (b) This Agreement ends and ceases to be of any effect on the date the Agreement is terminated under clause 6.

## 3. Priority of documents

If there is any inconsistency between any of the documents forming part of this Agreement those documents will be interpreted in the following order of priority to the extent of the inconsistency:

- (a) the 'Agreed terms' of this Agreement (being clauses 1 through to 8);
- (b) Schedule 1 - Agreement Details;

- (c) any Annexure(s) in their order of appearance; and
- (d) documents incorporated by reference in this Agreement.

## **4. Activity**

### **4.1 Obligation to carry out the Activity**

The parties must carry out the Activity:

- (a) as described in clause 4.3 of this Agreement;
- (b) to protect and conserve the Protected Matter within the Offset Area and to the extent required by condition 2(b) of EPBC 2015/7464;
- (c) in accordance with all applicable Laws;
- (d) so as to deliver the Activity Objective and meet all reporting requirements, in accordance with the requirements of this Agreement; and
- (e) otherwise in accordance with the provisions of this Agreement.

### **4.2 Activity Objective**

The Activity Objective is to protect and conserve the Lowland Rainforest of Subtropical Australia by legally securing the Offset Area described in condition 2(b) of the approval for EPBC 2015/7464.

### **4.3 Activity particulars**

- (a) TMR will implement actions in respect of the Offset Area to protect and improve the condition of Lowland Rainforest of Subtropical Australia, including:
  - i. implementing the Offset Agreement with Council to ensure the Offset Area is managed to meet the requirements of condition 2(b) of the approval for EPBC 2015/7464;
  - ii. undertaking any community consultation activities associated with implementing the Agreement; and
  - iii. monitoring achievement of the requirements of condition 2(b) of the approval for EPBC 2015/7464, and informing other parties to this Agreement of additional management requirements (if any).
- (b) NRME will not take any action that would prevent or otherwise impede the implementation of the Offset Agreement and offset required by condition 2(b) of EPBC 2015/7464;
- (c) Council will implement actions in and adjacent to the Offset Area to protect the Lowland Rainforest of Subtropical Australia, including:
  - i. implementing the Offset Agreement with TMR to ensure the Offset Area is managed to meet the requirements of condition 2(b) of the approval for EPBC 2015/7464;
  - ii. in the Offset Area:
    - a. controlling weeds, and planting native trees and shrubs, to ensure at least 70 per cent:
      - of canopy vegetation is native vegetation; and

- of total vegetation cover is native vegetation.
- b. ensuring all plantings within the Offset Area use native woody species from the Lowland Rainforest of Subtropical Australia threatened ecological community listing advice; and
- c. ensuring the Offset Area contains at least 30 species from the Lowland Rainforest of Subtropical Australia threatened ecological community listing advice, and that plantings maximise the distribution and survival of those 30 species.

#### **4.4 Review**

- (a) A review of the operation of this Agreement, including the Schedules, must be undertaken by the parties:
  - (i) if monitoring conducted in accordance with clause 4.3(a)(iii) indicates the requirements of condition 2(b) of the approval for EPBC 2015/7464 are not likely to be achieved before 31 December 2026; or
  - (ii) if condition 2(b) of the approval for EPBC 2015/7464 is varied in accordance with section 143 of the EPBC Act; or
  - (iii) by 31 December 2024.
- (b) Prior to a review being undertaken, the parties will agree in writing on:
  - (i) the terms of the review;
  - (ii) the scope of the review; and
  - (iii) the date by which the review will be completed.
- (c) A review may be linked to a report requested under clause 4.5.
- (d) Failure to undertake the review contemplated by clause 4.4(a) does not invalidate this Agreement.
- (e) Subject to clause 6.2(b), this clause does not limit the Minister's powers to terminate or vary this Agreement under section 308 of the EPBC Act.

#### **4.5 Reporting**

Subject to any written agreement to the contrary, TMR must report on the implementation and effectiveness of this Agreement as part of TMR's annual reporting as required under condition 6 of the approval for EPBC 2015/7464.

#### **4.6 General**

Subject to any written agreement to the contrary, each party must bear its own costs of any review undertaken, and reports prepared, pursuant to clauses 4.4 and 4.5.

### **5. Dispute resolution**

#### **5.1 Dispute resolution**

- (a) If a dispute arises in relation to the conduct of this Agreement, a party must comply with this clause 5.1 before starting court proceedings (except proceedings for urgent interlocutory relief). After a party has sought or

obtained urgent interlocutory relief, that party must comply with this clause 5.1.

- (b) The parties agree that any dispute arising during the course of this Agreement will be dealt with as follows:
  - (i) any party may give written notice of a dispute to the other party which will state that it is a notice under this clause and will specify the details of the dispute concerned;
  - (ii) management representatives of each of the parties will endeavour in good faith to agree upon a resolution of the dispute;
  - (iii) if the management representatives fail to reach a solution within 10 Business Days of receipt of a notice of dispute (or a timeframe agreed in writing between the parties), the dispute will be taken to senior executive representatives of each of the parties;
  - (iv) senior executive representatives will endeavour in good faith to agree upon a resolution of the dispute;
  - (v) if the senior executive representatives fail to resolve the dispute within 10 Business Days (or other timeframe agreed in writing between the parties), the dispute will be taken to the:
    - (A) Chief Executive Officer of Council;
    - (B) Regional Director (North Coast and Wide Bay Burnett) of TMR;
    - (C) Secretary of NRME; and
    - (D) Secretary of Department,who will endeavour to reach agreement regarding the dispute.
- (c) If agreement cannot be reached in accordance with clause 5.1(b), the parties must endeavour to resolve any dispute under this Agreement by mediation or other alternative dispute resolution method before they commence legal proceedings (except proceedings for urgent interlocutory relief).

## **5.2 Costs**

Each party to a dispute must pay its own costs of complying with this clause. The parties to the dispute must equally pay the costs of any mediator or other alternative dispute resolution provider.

## **5.3 Breach of this clause**

If a party to a dispute breaches clause 5.1 to 5.2, the other party does not have to comply with those clauses in relation to the dispute.

# **6. Termination or variation**

## **6.1 Termination by agreement**

This Agreement may be terminated by agreement between the parties in accordance with section 308(3)(a) of the EPBC Act.

## **6.2 Termination or variation by order**

- (a) Notwithstanding any other provision of this Agreement, this Agreement may be terminated or varied by the Minister by order published in the *Gazette* in accordance with section 308(4) of the EPBC Act.

- (b) If the Minister varies this Agreement by an order made under section 308(4) of the EPBC Act, this Agreement may be terminated by Council or the State of Queensland in accordance with section 308(7) of the EPBC Act.
- (c) In accordance with section 308(8) of the EPBC Act, if the Agreement is terminated or varied by an order, Council or the State of Queensland are not entitled to any compensation in respect of the termination or variation.

### **6.3 Variation**

Subject to clause 6.2 and the Minister's rights under section 308 of the EPBC Act, no agreement or understanding varying or extending this Agreement is legally binding upon a party to this Agreement unless the agreement or understanding is in writing and signed by the parties.

## **7. Notices**

### **7.1 Service of notices**

- (a) A party giving notice or notifying under this Agreement must do so in English. The notice must be given in writing:
  - (i) directed to the other party's contact person at the other party's address (as set out in Item 5 of the Agreement Details or subsequently notified by the first party); and
  - (ii) hand delivered or sent by prepaid post to that address.
- (b) A party to this Agreement must ensure it provides current and correct contact details to the other party.

### **7.2 Effective on receipt**

A notice given in accordance with clause 7.1 takes effect when it is taken to be received (or at a later time specified in it), and is taken to be received:

- (a) if hand delivered, on delivery; or
- (b) if sent by prepaid post, on the sixth Business Day after the date of posting (or on the seventh Business Day after the date of posting if posted to or from a place outside Australia).

## **8. General clauses**

### **8.1 Rights and powers of the Minister**

The rights and powers of the Minister under this Agreement are in addition to any rights and powers the Minister has under the EPBC Act.

### **8.2 Ownership of Agreement**

All copyright and other intellectual property rights contained in this Agreement remain the property of the Commonwealth.

### **8.3 Approvals and consents**

Except where this Agreement expressly states otherwise, a party may, in its discretion, give conditionally or unconditionally or withhold any approval or consent under this Agreement.

#### **8.4 Assignment and novation**

A party may only assign its rights or novate its rights and obligations under this Agreement with the prior written consent of the other party.

#### **8.5 Costs**

A party must pay its own costs of negotiating, preparing and executing this Agreement.

#### **8.6 Counterparts**

This Agreement may be executed in counterparts. All executed counterparts constitute one document.

#### **8.7 Entire agreement**

This Agreement constitutes the entire agreement between the parties in connection with its subject matter and supersedes all previous agreements or understandings between the parties in connection with its subject matter.

#### **8.8 Further action**

Each party must do, at its own expense, everything reasonably necessary (including executing documents) to give full effect to this Agreement and any transaction contemplated by it.

#### **8.9 Severability**

A term or part of a term of this Agreement that is illegal or unenforceable may be severed from this Agreement and the remaining terms or parts of the terms of this Agreement continue in force.

#### **8.10 Waiver**

Waiver of any provision of or right under this Agreement:

- (a) must be in writing signed by the party entitled to the benefit of that provision or right; and
- (b) is effective only to the extent set out in any written waiver.

#### **8.11 Relationship**

- (a) The parties must not represent themselves, and must ensure that their officers, employees, agents and subcontractors do not represent themselves as being an officer, employee, partner or agent of the other party, or as otherwise able to bind or represent the other party.
- (b) This Agreement does not create a relationship of employment, agency or partnership between the parties.

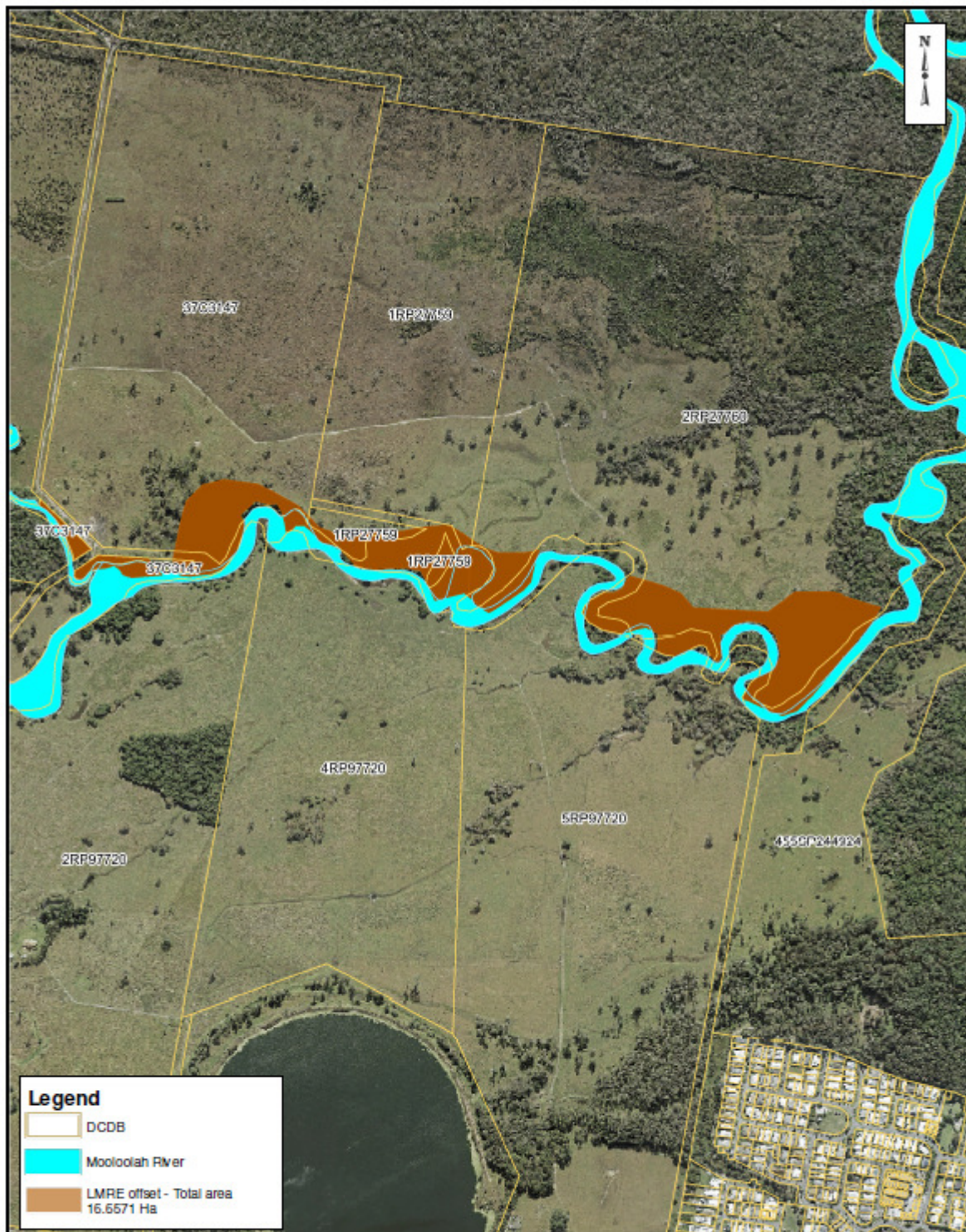
#### **8.12 Governing law and jurisdiction**

This Agreement is governed by the law of the Australian Capital Territory and each party irrevocably and unconditionally submits to the non-exclusive jurisdiction of the courts of the Australian Capital Territory.

## Schedule 1 – Agreement Details

| Item No. | Description                | Clause reference | Details                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|----------|----------------------------|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1.       | <b>Department details</b>  | 1.1              | <b>Commonwealth of Australia as represented by the Department of the Environment and Energy</b><br>ABN 34 190 894 983                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 2.       | <b>Council details</b>     | 1.1              | <b>Sunshine Coast Regional Council</b><br>ABN 37 876 973 913                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 3.       | <b>TMR details</b>         | 1.1              | <b>Department of Transport and Main Roads</b><br>ABN 39 407 690 291                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 4.       | <b>NRME details</b>        | 1.1              | <b>Department of Natural Resources, Mines and Energy</b><br>ABN 59 020 847 551                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 5.       | <b>Address for notices</b> | 7.1              | <p><b>Department:</b><br/> Vaughn Cox, Post Approval Section<br/> Department of the Environment and Energy<br/> Postal address: GPO Box 787, Canberra, ACT, 2601<br/> Email: <a href="mailto:post.approval@environment.gov.au">post.approval@environment.gov.au</a></p> <p><b>Council:</b><br/> Name: Steven Milner<br/> Position: Natural Areas Technical Officer<br/> Postal address: Locked Bag 72, Sunshine Coast Mail Centre, Qld 4560<br/> Email: <a href="mailto:Steven.Milner@sunshinecoast.qld.gov.au">Steven.Milner@sunshinecoast.qld.gov.au</a></p> <p><b>TMR:</b><br/> Name: Susan Scott<br/> Position: Environmental Officer<br/> Postal address: PO Box 1600, Maroochydore Q 4558<br/> Email: <a href="mailto:northcoast@tmr.qld.gov.au">northcoast@tmr.qld.gov.au</a></p> <p><b>NRME:</b><br/> Name: Teresa Furnell<br/> Position: A/Principal Land Officer<br/> Postal address: PO Box 1080, Caboolture, Qld 4510<br/> Email: <a href="mailto:Teresa.Furnell@dnrme.qld.gov.au">Teresa.Furnell@dnrme.qld.gov.au</a></p> |

## Annexure 1 – Lowland Rainforest of Subtropical Australia ecological community Offset Area



|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                |                                                                                                                                               |                                  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
| <p>Projection: Map Grid of Australia (MGA) Zone 56, Geocentric Datum of Australia (GDA) 1994</p> <p>© The State of Queensland, 2017. © Henry JONES KNOX 2017</p> <p>Copyright in this work may be used in accordance with the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License. This work is licensed under a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License. For any particular purpose and distribution, reproduction and/or modification of this work, permission must be obtained from the copyright owner. This work is provided as a service to the public and is not intended to be used for any other purpose. The copyright owner disclaims any liability for any loss or damage arising from the use of this work.</p> | <p><b>Mooloolah River<br/>Lower Mooloolah River Environment<br/>Reserve (LMRE Reserve)</b></p> | <p>Plan No: <b>Map1</b></p> <p>Job No: <b>A</b> Date: <b>13/03/2017</b></p> <p>Drawn by: <b>R Field</b></p> <p>Checked by: <b>S Scott</b></p> | <p>Queensland<br/>Government</p> |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|

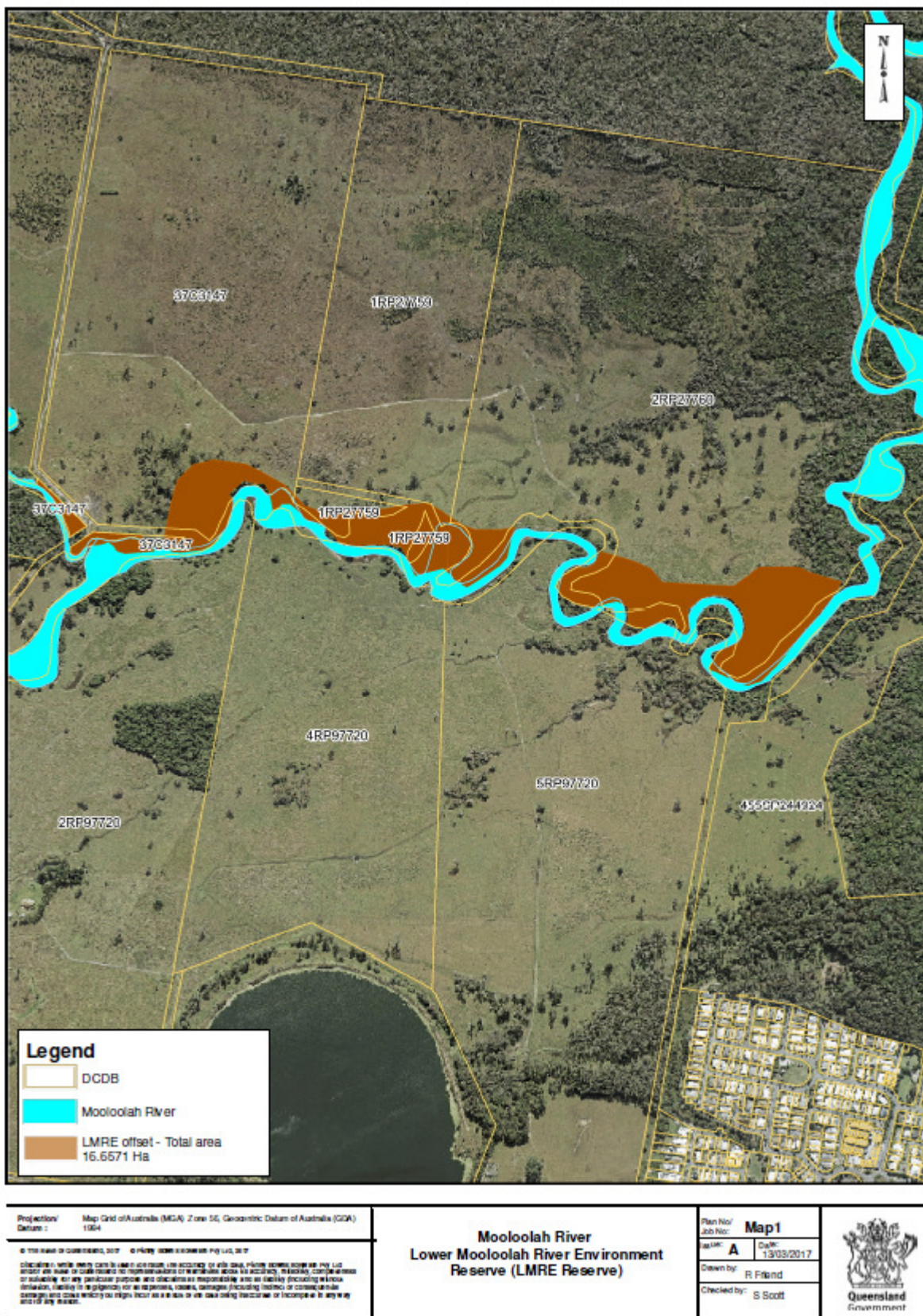
## Annexure 2 – Condition 2 and Attachment B of the conditions of approval for EPBC 2015/7464

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### Condition

2. For the protection of the **EPBC Act** listed critically endangered **Lowland rainforest of subtropical Australia** the **approval holder** must:
  - a. not disturb more than 3.92 ha of the **Lowland rainforest of subtropical Australia** threatened ecological community within and adjacent to the **project site**, as shown in Attachment A;
  - b. enter into a **Conservation Agreement** over the offset of 16.64 ha at the location shown in Attachment B, and ensure that by the tenth anniversary of **commencement of the action**, the offset meets the following condition thresholds:
    - i. Canopy Cover: at least 70 per cent of canopy vegetation is native;
    - ii. Species Richness: contains 30 native woody species from the **Lowland rainforest of subtropical Australia threatened ecological community listing advice**; and
    - iii. Total vegetation: At least 70 per cent of total vegetation cover is native.
  - c. **legally secure** and implement the offset of 4.65 ha at the location shown in Attachment C by the first 12 month anniversary of the **commencement of the action**.

## Attachment B



## Annexure 3 – Offset Agreement (Lower Mooloolah River Environmental Reserve, 2017)

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# **Offset Agreement**

## **Lower Mooloolah River Environmental Reserve**

**2017**



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**THIS AGREEMENT** is made on the                      day of                      2017

**BETWEEN:**

**Sunshine Coast Council (ABN 37 876 973 913)** of 136-140 Currie Street,  
Nambour, QLD 4560

**AND**

**The State of Queensland (represented by Department of Transport and Main Roads) (ABN 39 407 690 291)** of 12 First Avenue, Maroochydore QLD 4558

## 1 Background

- a. The Council owns the Property. The Offset Area forms part of the Property.
- b. The Department wishes to engage the Council to undertake the Offset Project associated with the Project on the Offset Area in accordance with the Offset Management Plan.
- c. The Offset Project is to be secured by a Legally Binding Mechanism over the Offset Area within the Property.
- d. The Parties wish to record the terms of their agreement in relation to the Offset Project as set out in this Agreement.

**IT IS AGREED THAT:**

## 2 Definitions and Interpretation

## 2.1 Definitions

In this Agreement, unless the context requires otherwise:

**'Agreement'** means this agreement and all schedules and annexures contained in or attached to it.

**‘Business Day’** means a day that is not a Saturday, Sunday, bank day or public holiday in Brisbane, Queensland, Australia.

**‘Commencement of the Action Date’** means the date given by the Department under clause 5 identifying the commencement of the disturbance of vegetation identified as Lowland Rainforest of Subtropical Australia or koala habitat under the EPBC Approval for the Project.

**'Council'** means the Sunshine Coast Council (ABN 37 876 973 913).

**‘Council’s Agents’** means Council’s directors, employees, advisors, contractors and invitees.

**‘Department’** means The State of Queensland (represented by Department of Transport and Main Roads) (ABN 39 407 690 291).

**'Department's Nominated Representative'** means employees of the Department as nominated by the Department in writing from time to time.

**'EPBC Act'** means the *Environment Protection and Biodiversity Conservation Act 1999* (Cth).

**'EPBC Approval'** means the approval and conditions of approval for the Project given to the Department by the Australian Government Department responsible for administering the EPBC Act dated 2 September 2016.

**'Fee'** means the consideration payable by the Department to achieve the Offset Project on the Offset Area in accordance with the Offset Management Plan, payable in accordance with this Agreement.

**'GST Law'** means *A New Tax System (Goods and Services Tax) Act 1999* (Cth) and any related imposition and amending Acts.

**'Key Performance Indicators'** means the relevant outcomes listed under each Milestone in **Schedule 1**.

**'Legally Binding Mechanism'** means a protective mechanism as identified in the conditions of approval under the EPBC Approval for the Project in perpetuity.

**'Lowland Rainforest of Subtropical Australia'** means the vegetation community described in the 'Approved Conservation Advice for the Lowland Rainforest of Subtropical Australia' as published by the department responsible for administering the EPBC Act.

**'Milestones'** means each of the Milestones for completion of certain activities or achieving outcomes as described in **Schedule 1**.

**'Milestone Dates'** means the date for achievement of each Milestone set out in **Schedule 1**.

**'Offset Area'** means the offset area as shown on the plan annexed as **Schedule 3** to this Agreement.

**'Offset Management Plan'** means the plan titled "Offset Management Plan – Lowland Rainforest of Subtropical Australia" dated April 2017 as annexed to this Agreement as **Schedule 2** or as subsequently amended under clause 7 of this Agreement.

**'Offset Project'** means the protection and return of 16.64ha of Lowland Rainforest of Subtropical Australia Threatened Ecological Community as listed under the EPBC Act by the tenth anniversary of the Commencement of the Action Date (EPBC 2015/7464). The actions for the Offset Project are outlined in the Offset Management Plan.

**'Party'** means either of the Council or the Department and **'Parties'** means both of them.

**'Project'** means the Bruce Highway Upgrade – Caloundra Road to Sunshine Motorway (280/10A/1).

**'Property'** means the land described as Lot 37 on CP C3147 (Title Reference 10363036); Lot 1 on RP27759 (Title Reference 11057132); and Lot 2 on RP27760 (Title Reference 14372127).

**'Queensland Government Body'** means any of:

- (a) a body corporate or an unincorporated body established or constituted for a public purpose by the State of Queensland legislation, or an instrument made under that legislation (including a local authority);
- (b) a body established by the State of Queensland through the Governor or Minister; or
- (c) an incorporated company over which the State of Queensland exercises control.

**'Road Corridor Closure Plan'** means the road corridor closure plan annexed as **Schedule 4** to this Agreement.

**'Services'** means the services to be provided by Council to undertake the Offset Project as specified in **Schedule 5**.

**'Tax Invoice'** has the meaning given in GST Law.

## 2.2 Interpretation

- (a) A reference to a person includes a reference to a body corporate.
- (b) Words in the singular include the plural and words in the plural include the singular.
- (c) Any reference in this Agreement to any statute or regulation includes all amendments and revisions made from time to time to that statute or regulation.
- (d) Any note appearing as a heading in this Agreement has been inserted for convenience and reference only.

## 3. Term

This Agreement shall commence on the later of the dates of execution of this Agreement and shall, unless otherwise terminated under the provisions of this Agreement, conclude on achievement of Milestone 11 of the Key Performance Indicators.

**4. Not used****5. Notification of the Commencement of the Action Date**

The Department has advised Council by written notice that the Commencement of the Action Date was the 2 December 2016.

**6. Council's Obligations**

6.1. Within one (1) month of the execution of the Agreement by the last party, Council must commence the Services to achieve the Milestones by the Milestone Dates.

6.2. In performing the Services, Council must:

- (a) ensure the Offset Area is managed in accordance with the Offset Management Plan;
- (b) implement the Offset Management Plan and meet the Key Performance Indicators;
- (c) notify the Department in writing when each Milestone in Schedule 1 has been achieved. The written notice must include sufficient information for the Department to be satisfied that the Milestone has been achieved;
- (d) as soon as reasonably practical after the date of this Agreement but no later than the tenth anniversary of the Commencement of the Action Date:
  - i) secure a Legally Binding Mechanism with respect to the Offset Area and provide to the Department a written copy; and
  - ii) close parts of the road corridors that overlap the Offset Area as shown on the Road Corridor Closure Plan (**Schedule 4**);
- (e) comply with the requirements or conditions of any Legally Binding Mechanism and/or any other legally binding conditions which may imposed on the Department in relation to the Department's obligations to provide the offset for the Project;
- (f) undertake the monitoring and provide the reports required at the times and strictly in accordance with the monitoring and reporting requirements specified in sections 5.3.2 and 5.3.3 of the Offset Management Plan;
- (g) report and liaise with the Department's Nominated Representative in relation to the implementation of the Offset Management Plan;
- (h) take reasonable care to ensure that the performance of the Offset Management Plan is not interfered with or delayed or hindered by

any other work the Council may be doing under any other contract or arrangement with any other person or organisation;

- (i) inform the Department or the Department's Nominated Representative immediately if Council becomes aware of any factor, event or process that may impact negatively on the intended outcomes of the Offset Management Plan or delay or preclude achieving the Key Performance Indicators including securing a Legally Binding Mechanism with respect to the Offset Area;
- (j) consult with the Department in regards to any engagement activities throughout the term of the Agreement. These activities may include, but not be limited by, offset agreement media launch, staff and/ or community planting days, onsite signage and/or newsletters/ web articles;
- (k) provide other support services in relation to the Offset Project as may reasonably be required and requested by the Department. These support services may include provision of related data or access to the Property to undertake additional survey work; and
- (l) provide all necessary plant, equipment, materials and services necessary for the provision of the Services.

6.3. Council must not:

- (a) undertake any action that adversely affects native vegetation within the Offset Area unless authorised in the Offset Management Plan; and
- (b) be a party to the doing of any act, matter or thing prejudicial to the goodwill, commercial reputation or public image of the Department.

## **7. Amendment of Offset Management Plan**

- 7.1. The Offset Management Plan may be amended at any time by agreement in writing between the Parties as provided for in this clause and in accordance with section 1.1 (Review) of the Offset Management Plan.
- 7.2. A copy of any amended Offset Management Plan must be signed and dated by both Parties and will only be effective from the date of the amended Offset Management Plan specified by the Parties as being the date of the amendment.

## 8. Fee

- 8.1. Upon meeting each Milestone referred to in Schedule 1, the Council may issue an invoice to the Department which:
- (a) must be in the form of a Tax Invoice; and
  - (b) must include a notice which complies with the requirements of clause 6.2(c); and
  - (c) must equal the amount set out in Schedule 1 as corresponding with the relevant Milestone.
- 8.2. The Department must pay on a valid Tax Invoice issued under clause 8.1 within 30 Days of the date of issue of the Tax Invoice.
- 8.3. The Department has no obligation to pay an invoice until the relevant Milestone has been achieved (even if the Milestone Date for the relevant Milestone passes).
- 8.4. The Parties acknowledge that the payments under this Agreement are a fixed sum and that the Department has no obligation to pay any invoice (or any part of an invoice) which would result in the fees paid under this Agreement exceeding the total value of the invoices set out in **Schedule 1**. This clause applies even if, in carrying out its obligations under this Agreement, Council incurs costs in excess of the total amount set out in **Schedule 1** (regardless of whether such exceedance is as a result of unforeseen events or events not within the control of Council or otherwise).
- 8.5. In the event that the Department receives a Tax Invoice which:
- (a) it believes contains an error; or
  - (b) it is not reasonably satisfied that the Milestone has been met,
- then the Department must give written notice of the error or dissatisfaction to Council. Council must on receipt of such a notice, promptly investigate the error and if appropriate issue an adjustment note or another Tax Invoice to correct any such error as soon as practicable or provide satisfactory evidence the relevant Milestone has been met.

## 9. Protection of Works

- 9.1. Council will not act to damage or adversely impact the Offset Area with respect to the vegetation being protected by the Offset Project or adversely impact this vegetation that would hinder it from achieving any Key Performance Indicators.

- 9.2. The Council agrees to make good any damage as a result of the Council's actions in respect to the Offset Area in contravention of this clause 9.

## **10. Termination and Default**

- 10.1. If a Party does not complete their obligations under this Agreement, the non-defaulting Party may give the defaulting Party written notice requiring the default to be remedied within 30 Business Days.
- 10.2. If the defaulting Party does not remedy the default within 30 Business Days of receiving the notice, the non-defaulting Party may by further written notice terminate this Agreement.
- 10.3. Notwithstanding subclause 10.2 above, this Agreement may be terminated by the Department without further notice to the Council if the Council is in default in the performance and observance of its obligations under clause 6.
- 10.4. Where the Department has terminated this Agreement in accordance with subclause 10.3, no further amount of the Fee will be payable by the Department, and Council will be entitled to retain any amount of the Fee paid for a Milestone which has been achieved.
- 10.5. The Parties may terminate this Agreement at any time by mutual written agreement.
- 10.6. The Council acknowledges and accepts that in the event of termination of this Agreement its obligations under the Legally Binding Mechanism, will survive and remain in full effect and will bind the Council and its successors in title in perpetuity.

## **11. Termination for convenience**

- 11.1. The Department may terminate the Agreement, in whole or in part, for convenience by giving 60 days written notice to the Council.
- 11.2. If the Agreement is terminated in accordance with clause 11.1:
- (a) Council must, following receipt of that notice, immediately take all steps necessary to minimise the loss suffered by Council as a result of the termination, including taking all reasonable steps to prevent or minimise its liabilities to its contractors and sub-contractors;
  - (b) subject to clause 11.2(c), the Department must pay to Council the fees and expenses reasonably incurred by Council in carrying out the relevant Milestone set out in Schedule 1 to the date of termination together with any costs and expenses reasonably

incurred by Council which are directly attributable to the termination; and

- (c) the Department will not be liable for payment to Council for any compensation relating to loss of profit, revenue, goodwill or business opportunities, damage to reputation or indirect consequential loss, or any other reason in relation to termination nor will the Department be liable for payment to Council for any amount greater than the amount that Council would have paid to the Department had the Agreement been completely performed.

## **12. Insurances**

- 12.1. Council must, at its own cost, have and maintain during the term of this Agreement Public Risk Liability Insurance applying to all related operations of Council with respect to the occupancy of Council of the Offset Area. The policy will be written on a comprehensive basis with limits of not less than \$20,000,000 per occurrence. A copy of the Council policy will be provided to the Department upon request.

## **13. Covenant**

- 13.1. Council covenants that before it sells, transfers or otherwise disposes of the Property or any part of it to, or enters into an agreement to do so, it will procure the purchaser, assignee or transferee to sign a deed for the benefit of the Department (on terms acceptable to the Department, acting reasonably) agreeing to be bound by the same terms as contained in this Agreement as part of the sale, transfer or disposal.

## **14. Warranties**

- 14.1. Council warrants that at the date of this Agreement:
  - (a) there are no agreements for the assignment of any rights, interests or other agreement affecting the Offset Area under ownership of Council;
  - (b) Council has not received a notice of resumption or intended resumption affecting the Offset Area under ownership of Council; and
  - (c) Council has obtained consent from all third Parties with a registered interest affecting the Offset Area under ownership of Council, to this Agreement.

**15. Confidentiality**

- 15.1. The Department acknowledges that Council may release information on the works undertaken under this Agreement.
- 15.2. Council agrees that any release of information under subclause 15.1 will not include any information relating to the Fee.
- 15.3. The Parties agree that no announcement or communication relating to the Fee under this Agreement or any negotiations pertaining thereto shall be made to any person unless such announcement or communication is:
- (a) in a form agreed in writing by the Parties who shall act reasonably and promptly in this regard;
  - (b) made solely to facilitate the transaction contemplated by this Agreement after consultation between the Parties and with their approval;
  - (c) required by law or pursuant to any statutory duty or obligation; or
  - (d) reasonably necessary to obtain any legal or financial advice in relation to any transaction contemplated by this Agreement; or
  - (e) relates to information already in the public domain through no act of the Party to whom the information was disclosed
- 15.4. The Department may make disclosure of this Agreement and any information received in relation to this Agreement to its Ministers and their advisers.
- 15.5. This clause 15 survives termination or expiry of this Agreement.

**16. Legal Relationship**

- 16.1. The Parties agree that:
- (a) neither this Agreement nor the performance of their obligations under this Agreement shall create any relationship of employer and employee or partnership or lessor and lessee between the Parties, and
  - (b) nothing contained in this Agreement shall in any way constitute either of the Parties as agents, trustees or servants of or for the other Party or any other person or persons whomsoever.
- 16.2. Neither Party shall represent, imply or hold out to any third party that it is a servant or agent of the other.

**17. Assignment**

- 17.1. Unless the Council has obtained the prior written consent of the Department, it must not (nor may it attempt to do so) assign all or any part of its right, title or interest in this Agreement, nor novate it.
- 17.2. Council acknowledges and accepts that the Department may, on notice to Council advising the effective date of the assignment or novation, assign all or any part of its right, title or interest in this Agreement, or it may novate it, to any other Queensland Government Body.

**18. Notices****18.1. Procedure**

- (a) All notices authorised under this Agreement to be given by a Party to the other shall be in writing delivered personally or sent by registered post and in each case addressed to the other Party at the Party's address set forth hereunder or as the case may be at such other address as a Party may from time to time notify to the other Party.

**18.2. Proof of Receipt of Notice**

- (a) The following shall constitute proof of receipt:
- i) in the case of notices sent by registered post, delivery confirmation notice from Australia Post;
  - ii) in the case of personal delivery a statutory declaration attesting to the delivery.

**19. Binding of Successors**

This Agreement endures for the benefit of and is binding upon the Parties and their successors and permitted assigns.

**20. Governing Law**

- 20.1. This Agreement is governed by the laws of Queensland and the Commonwealth of Australia which are in force in Queensland.
- 20.2. The Parties irrevocably and unconditionally submit to the jurisdiction of the Courts of Queensland, relevant Federal Courts and appellate courts.

**21. Further Assurances**

The Parties must execute and deliver all documents and must do all things as are reasonably necessary for the complete performance of their respective obligations under this Agreement.

**22. Entire Understanding**

22.1. This Agreement contains the entire understanding and agreement between the Parties as to the subject matter of this Agreement.

22.2. All previous negotiations, understandings, representations, warranties, memoranda or commitments about the subject matter of this Agreement are merged in this Agreement and are of no further effect.

22.3. No oral explanation or information provided by a Party to another affects the meaning or interpretation of this Agreement or constitutes any collateral agreement, warranty or understanding.

**23. Waiver**

No provision of this Agreement will be deemed to be waived unless that waiver is in writing and signed by the waiving Party.

**24. Severance**

If a provision of this Agreement is void or unenforceable it must be severed from this Agreement and the provisions that are not void and unenforceable are unaffected by the severance.

**25. Cumulative Rights**

The rights and remedies of a Party to this Agreement are in addition to the rights and remedies conferred on the Party at law or in equity.

**26. Attorneys**

Where this Agreement is executed for a Party by an attorney, the attorney by executing it declares that the attorney has no notice of revocation by the power of attorney.

**27. Costs**

The Parties must bear their own costs of and incidental to the negotiation, preparation and execution of this Agreement.

**28. Stamp Duty**

If stamp duty on this agreement is payable, the Parties agree that the Department will pay these associated costs.

**29. GST****29.1. Goods and Service Tax**

Any consideration to be provided for any supply made under or in connection with this Agreement, unless expressly described in this

Agreement as including GST, does not include an amount on account of GST.

Despite any other provision in this Agreement, if a Party to this Agreement (**Supplier**) makes a Taxable Supply under or in connection with this Agreement on which GST is imposed:

- (a) the GST exclusive consideration otherwise payable or to be provided for that Taxable Supply under this Agreement but for the application of this clause is increased by, and the recipient of the supply (**Recipient**) must also pay to the Supplier, an amount equal to the GST payable by the Supplier on that Taxable Supply; and
- (b) the amount by which the GST exclusive consideration is increased must be paid to the Supplier by the Recipient without set off, deduction or requirement for demand, at the same time as the GST exclusive consideration is payable or to be provided. However, the Recipient need not pay any amount referable to GST unless they have received a valid Tax Invoice (or a valid Adjustment Note) for that Taxable Supply.

#### 29.2. Reimbursements

If a payment to a Party under or in connection with this Agreement is a reimbursement or indemnification, calculated by reference to a loss, cost or expense incurred by that Party, then the payment must be reduced by the amount of any Input Tax Credit to which that Party is entitled for that loss, cost or expense. That Party is assumed to be entitled to a full Input Tax Credit unless it proves, before the date on which the payment must be made, that its entitlement is otherwise.

#### 29.3. Adjustment Events

If at any time, an Adjustment Event arises in respect of any Taxable Supply made by a Supplier under the Agreement, a corresponding adjustment must be made between the parties in respect of any amount paid pursuant to clause 29.1. Payments to give effect to the adjustment must be made between the Parties and the Supplier must issue a valid Adjustment Note in relation to the Adjustment Event.

#### 29.4. GST Group

If a Party is a member of a GST Group, references to GST which the Party must pay and to Input Tax Credits to which the Party is entitled, include GST which the representative member of the GST Group must pay and Input Tax Credits to which the representative member of the group is entitled.

### 29.5. Non-Monetary Consideration

If a supply made under this Agreement is a Taxable Supply made for non-monetary consideration the:

- (a) the Supplier must provide the Recipient with a Valid Tax Invoice which states the GST inclusive market value of the non-monetary consideration, and
- (b) for the avoidance of doubt any non-monetary consideration payable under or in connection with this Agreement is GST inclusive.

### 29.6. Definitions

Words or expressions used in this clause which are defined in the GST Law shall have the same meaning in this clause.

### 29.7. Survival

This clause will continue to apply after expiration or termination of this Agreement.

## **30. Dispute Resolution**

### 30.1. No proceedings

A Party must not commence court proceedings (except proceedings seeking interlocutory relief) in respect of a dispute arising out of this Agreement unless it has complied with this clause 30.

### 30.2. Notice of dispute

A Party claiming that a dispute has arisen must give each Party to the dispute a dispute notice:

- (a) stating the nature of the dispute
- (b) providing brief particulars of the facts and circumstances relied upon by the Party serving the Dispute Notice, and
- (c) nominating an authorised representative ('Authorised Representative') to settle the dispute on its behalf.

The Party served with the dispute notice has 5 Business Days to nominate in writing an Authorised Representative to settle the dispute on its behalf.

### 30.3. Negotiation

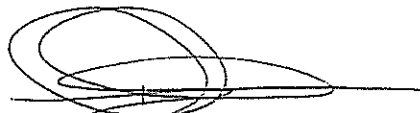
Within 10 Business Days of the service of the dispute notice, the Parties must meet, negotiate and seek to resolve the dispute in good faith.

Executed as an agreement on the dates appearing below

Executed by The State of Queensland  
(represented by Department of  
Transport and Main Roads) ABN 39  
407 690 291 by its authorised  
representative in the presence of:

El Chapman  
Witness Signature

Emma Chapman  
Print Name



Authorised Representative Signature

DOUGLAS WASS  
Print Name

DISTRICT DIRECTOR (NCD)  
Position

Dated: 11 day of May 2017

Executed by Sunshine Coast Council  
ABN 378 769 739 13 by its authorised  
representative in the presence of:

[Signature]  
Witness Signature

Swelch  
Print Name



Authorised Representative Signature

Michael Whittaker  
Print Name

Chief Executive Officer  
Position

Dated: 1 day of June 2017

## SCHEDULE 1 – MILESTONE, MILESTONE DATES AND KEY PERFORMANCE INDICATORS

| Milestone | Milestone Dates                  | GST (ex) | GST (inc) |
|-----------|----------------------------------|----------|-----------|
| 1         | Agreement signed by both parties |          |           |
| 2         | 2 December 2017                  |          |           |
| 3         | 2 December 2018                  |          |           |
| 4         | 2 December 2019                  |          |           |
| 5         | 2 December 2020                  |          |           |
| 6         | 2 December 2021                  |          |           |
| 7         | 2 December 2022                  |          |           |
| 8         | 2 December 2023                  |          |           |
| 9         | 2 December 2024                  |          |           |
| 10        | 2 December 2025                  |          |           |
| 11        | 2 December 2026                  |          |           |
|           | <b>Total</b>                     |          |           |
|           | GST Amount                       |          |           |

### **Milestone 1: Agreement signed by both parties**

### **Milestone 2: Submission of annual report 1 and applicable project outcomes realised**

#### **Key Performance Indicators**

Milestone 2 will be met when the following outcomes have been realised:

- Council delivers to the Department the annual report required by clause 6.2(f) of the Agreement
- Monitoring photos provided
- Canopy cover – at least 50% of canopy vegetation is native
- Species richness – contains 20 native woody species

- Total vegetation – at least 50% of total vegetation cover is native
- Weed Cover – less than 10%

**Milestone 3: Submission of annual report 2 and applicable project outcomes realised**

**Key Performance Indicators**

Milestone 3 will be met when the following outcomes have been realised:

- Council delivers to the Department the annual report required by clause 6.2(f) of the Agreement
- Monitoring photos provided
- Canopy cover – at least 50% of canopy vegetation is native
- Species richness – contains 20 native woody species
- Total vegetation – at least 50% of total vegetation cover is native
- Weed Cover – less than 10%
- Reveg plant height – average 0.3m – 1m

**Milestone 4: Submission of annual report 3 and applicable project outcomes realised**

**Key Performance Indicators**

Milestone 4 will be met when the following outcomes have been realised:

- Council delivers to the Department the annual report required by clause 6.2(f) of the Agreement
- Monitoring photos provided
- Canopy cover – at least 60% of canopy vegetation is native
- Species richness – contains 20 native woody species
- Total vegetation – at least 60% of total vegetation cover is native
- Weed Cover – less than 5%

Reveg plant height – average 1m – 1.5m

**Milestone 5: Submission of annual report 4 and applicable project outcomes realised**

**Key Performance Indicators**

Milestone 5 will be met when the following outcomes have been realised:

- Council delivers to the Department the annual report required by clause 6.2(f) of the Agreement
- Monitoring photos provided
- Canopy cover – at least 60% of canopy vegetation is native
- Species richness – contains 20 native woody species
- Total vegetation – at least 60% of total vegetation cover is native
- Weed Cover – less than 5%
- Reveg plant height – average 1.5m – 2m

**Milestone 6: Submission of annual report 5 and applicable project outcomes realised****Key Performance Indicators**

Milestone 6 will be met when the following outcomes have been realised:

- Council delivers to the Department the annual report required by clause 6.2(f) of the Agreement
- Monitoring photos provided
- Canopy cover – at least 70% of canopy vegetation is native
- Species richness – contains 20 native woody species
- Total vegetation – at least 70% of total vegetation cover is native
- Weed Cover – less than 5%
- Revegetation plant height – average 2m – 3m

**Milestone 7: Submission of annual report 6 and applicable project outcomes realised****Key Performance Indicators**

Milestone 7 will be met when the following outcomes have been realised:

- Council delivers to the Department the annual report required by clause 6.2(f) of the Agreement
- Monitoring photos provided
- Canopy cover – at least 70% of canopy vegetation is native
- Species richness – contains 30 native woody species
- Total vegetation – at least 70% of total vegetation cover is native
- Weed Cover – less than 5%
- Revegetation plant height – average 3m – 4m

**Milestone 8: Submission of annual report 7 and applicable project outcomes realised****Key Performance Indicators**

Milestone 8 will be met when the following outcomes have been realised:

- Council delivers to the Department the annual report required by clause 6.2(f) of the Agreement
- Monitoring photos provided
- Canopy cover – at least 95% of canopy vegetation is native
- Species richness – contains 30 native woody species
- Total vegetation – at least 80% of total vegetation cover is native
- Weed Cover – less than 5%
- Revegetation plant height – average 4m – 5m

**Milestone 9: Submission of annual report 8 and applicable project outcomes realised****Key Performance Indicators**

Milestone 9 will be met when the following outcomes have been realised:

- Council delivers to the Department the annual report required by clause 6.2(f) of the Agreement
- Monitoring photos provided
- Canopy cover – at least 95% of canopy vegetation is native
- Species richness – contains 30 native woody species
- Total vegetation – at least 80% of total vegetation cover is native
- Weed Cover – less than 5%
- Reveg plant height – average 5m – 6m

**Milestone 10: Submission of annual report 9 and applicable project outcomes realised**

**Key Performance Indicators**

Milestone 10 will be met when the following outcomes have been realised:

- Council delivers to the Department the annual report required by clause 6.2(f) of the Agreement
- Monitoring photos provided
- Canopy cover – at least 95% of canopy vegetation is native
- Species richness – contains 30 native woody species
- Total vegetation – at least 90% of total vegetation cover is native
- Weed Cover – less than 5%
- Reveg plant height – average 6m – 7m
- Application of a Legally Binding Mechanism as required by the EPBC Approval

**Milestone 11: Submission of annual report 10 and applicable project outcomes realised**

**Key Performance Indicators**

Milestone 11 will be met when the following outcomes have been realised:

- Council delivers to the Department the annual report required by clause 6.2(f) of the Agreement
- Monitoring photos provided
- Canopy cover – at least 95% of canopy vegetation is native
- Species richness – contains 30 native woody species
- Total vegetation – at least 95% of total vegetation cover is native
- Weed Cover – less than 5%
- Reveg plant height – average >7m

## **SCHEDULE 2 – OFFSET MANAGEMENT PLAN**

# Offset Management Plan – Lowland Rainforest of Subtropical Australia

## Lower Mooloolah River Environmental Reserve

EPBC 2015/7464

April 2017

# Creative Commons information

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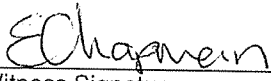
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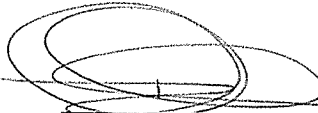
| Version | Type of Amendment                                                                                   | Author   | Date          |
|---------|-----------------------------------------------------------------------------------------------------|----------|---------------|
| 1       | Draft                                                                                               | S. Scott | February 2016 |
| 2       | Draft, based on comments from Sunshine Coast Council                                                | S. Scott | March 2016    |
| 3       | Revised area of offset and strengthening information on Lowland Rainforest of Subtropical Australia | S. Scott | August 2016   |
| 4       | Amendments based on the issuing of the approval for the Project under the EPBC Act                  | S. Scott | November 2016 |
| 5       | Revised polygon area, protective mechanism information, update zonation information                 | S.Scott  | February 2017 |
| 6       | Amendments based on SCC input                                                                       | S.Scott  | March 2017    |
| 7       | Replacement of map in Attachment 2 based on revised EPBC Act conditions of approval                 | S.Scott  | April 2017    |

Executed on the dates appearing below

Executed by The State of Queensland  
(represented by Department of Transport  
and Main Roads) ABN 39 407 690 291 by  
its authorised representative in the presence  
of:

  
Witness Signature

Emma Chapman  
Print Name

  
Authorised Representative Signature

DOUGLAS WARR  
Print Name

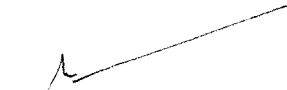
DISTRICT DIRECTOR (NORTH EAST)  
Position

Dated: 31 day of May 2017

Executed by Sunshine Coast Council ABN  
378 769 739 13 by its authorised  
representative in the presence of:

  
Witness Signature

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Dated: 9 day of June 2017

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# 1. Introduction

This Offset Management Plan (OMP) has been developed<sup>1</sup> to demonstrate the objectives of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) Environmental Offsets Policy in compensating for impacts on the Lowland Rainforest of Subtropical Australia (LRSA) Threatened Ecological Community (TEC). The impacts on this TEC will result from works associated with the Department of Transport and Main Roads' (TMR) Bruce Highway Upgrade – Caloundra Road to Sunshine Motorway (EPBC 2015/7464) (the 'Project').

The scope of this OMP is to align specific environmental revegetation, regeneration, rehabilitation and protection measures for vegetation that occurs in a portion of the Lower Mooloolah River Environmental Reserve (LMRE Reserve), Laxton Road, Palmview. These activities will deliver TMR's offset obligations under the EPBC Act, yielding an overall conservation outcome for the LRSA TEC.

This OMP will also be used to direct the development of operational technical specifications for Sunshine Coast Council's (SCC) delivery of the rehabilitation objectives. Through the alignment of the operational technical specifications and the OMP objectives, TMR and SCC will be able to clearly demonstrate correlation between the Project's impact on the LRSA TEC and the rehabilitation activities within the offset area of the LMRE Reserve, as well as optimising the likelihood for on-ground success.

The actions proposed in this OMP and implemented within the offset area of the LMRE Reserve will be undertaken through an agreement between SCC and TMR.

## 1.1 Review

The management actions outlined in this plan will be reviewed and updated on an 'as needs' basis during the ten year active management period. Any review in the ten year management period (TMR's obligation period associated with the Project outlined in Section 1) can be initiated by TMR, SCC or the Australian Department of the Environment and Energy (DoEE). A review and update is most likely to be triggered based on advances in knowledge of revegetation/restoration activities related to the management actions. However, any review of the OMP must ensure the offset obligations (as outlined in the Offset Agreement) and the intent of the original document are not changed.

SCC or any subsequent landowner(s) may review this OMP after the ten year management period, whilst considering obligations outlined in any conditions of approval relevant to EPBC 2015/7464. Any review may need to be undertaken in consultation with DoEE.

## 1.2 Background

The LMRE Reserve is located along Claymore Road, Palmview and currently owned in freehold by SCC. Portions of Lot 37 on C3147, Lot 1 on RP27759 and Lot 2 RP27760 of the LMRE Reserve are the focus of the environmental

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<sup>1</sup> TMR acknowledges significant portions of this report are taken from the Stringybark Consulting (2012) report developed for SCC, which outlines the management of the LMRE Reserve, in addition to the recently compiled TMR report specific to the offset area, developed by RPS (2016).

management actions described in this report. The LMRE Reserve was purchased by SCC in 2011 for environmental purposes. SCC is working with third parties (such as TMR) to implement environmental outcomes on the property.

A number of surveys and reports have been undertaken on the LMRE Reserve properties. These works have been prepared to provide technical information to underpin conservation management decisions undertaken by SCC and have assisted in the development of this OMP. Relevant reports include:

- Flora Assessment (Eco 9 Consulting, 2011)
- Bushland Operations Assessment (ENAM, 2011)
- Vegetation Management Plan (Revegetation and Rehabilitation) (Stringybark Consulting, 2012);
- Threatened Ecological Community Impact Assessment (Lowland Rainforest of Subtropical Australia) (RPS, 2016).

## 1.3 Objectives and Purpose

The purpose of the OMP is to guide the management and rehabilitation of 16.64ha of vegetation within the LMRE Reserve (Figure 1). Specifically, this offset area will be managed through progressive rehabilitation over a ten year management period to restore this area's vegetation back to LRSA TEC (in accordance with the 'Description' outlined in LRSA TEC listing advice (TSSC (2011) (refer to Attachment 1)). Progressive rehabilitation is largely anticipated through ongoing weed management and natural regeneration and regrowth.

This report aims to:

- Deliver detailed information to guide on-ground management and revegetation operations;
- Provide a decision making support tool;
- Detail requirements for fencing and access; and
- Provide a maintenance program for the Offset Agreement period which identifies and prioritises rehabilitation activities.

The overall objectives of the offset, to satisfy TMR's offset obligations associated with the Project (EPBC 2015/7464). The relevant conditions of approval are outlined below, with the full set of conditions in Attachment 2.

*"For the protection of the EPBC Act listed critically endangered Lowland rainforest of subtropical Australia the approval holder must:*

*b. legally secure and implement the offset of 16.64ha at the location shown in Attachment B [shown in Figure 2 of this document], and ensure by the tenth anniversary of commencement of the action, the offset meets the following condition thresholds:*

- i. Canopy Cover: at least 70 per cent canopy vegetation is native;*
- ii. Species Richness: contains 30 native woody species from the Lowland rainforest of subtropical Australia threatened ecological community listing advice [Attachment 1]; and*
- ii. Total vegetation: at least 70 per cent of the total vegetation cover is native."*

## 1.4 Term of Offset Management Plan

The commencement of the Project occurred on the 2 December 2016. The actions and management outlined in this OMP shall be delivered and achieved by SCC on behalf of TMR by the tenth anniversary of the commencement of the Project (that is, 2 December 2026).

## 1.5 Offset Site Description and Location

The LMRE Reserve is comprised of three adjacent freehold properties located south of Mooloolah River National Park, Mooloolah River section along Claymore Road, Palmview, Queensland (Figure 1). Property descriptions for the LMRE Reserve are Lot 37 on C3147, Lot 1 on RP27759 and Lot 2 on RP27760.



Figure 1: LMRE Reserve location

The LMRE Reserve is located immediately downstream of the confluence of Mooloolah River and Sippy Creek and has a strong vegetation link to the east and north. Urban development is planned to the east and west of the environmental reserve.

TMR's offset obligation will be met within the LMRE Reserve landholdings, specifically in the southern sections of Lot 37 on C3147, Lot 1 on RP27759 and Lot 2 on RP27760 and within land located within the Mooloolah River corridor (Figure 2). The offset obligation area to which this OMP applies is shown in red in Figure 2.

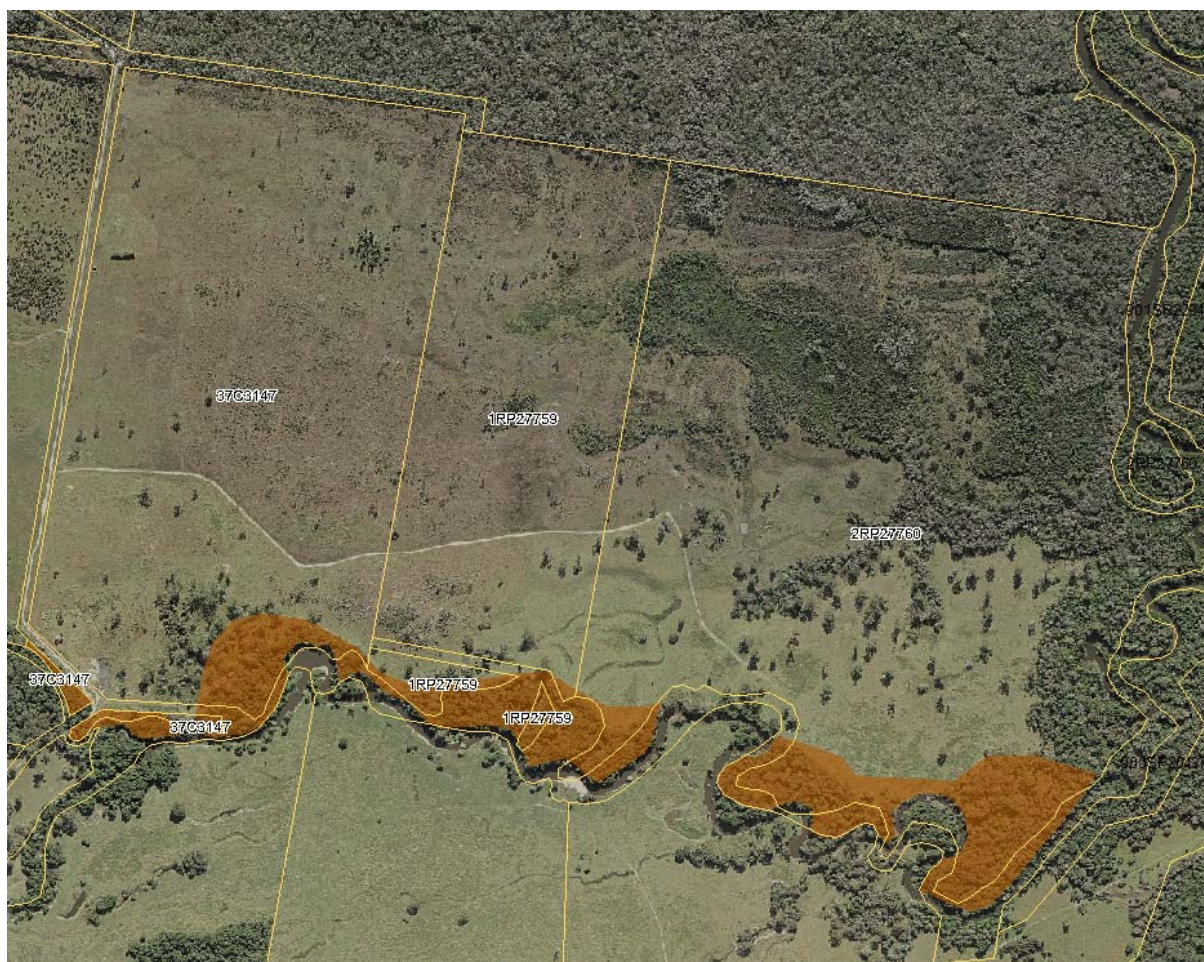


Figure 2: Offset Area associated with LMRE Reserve

## 1.5.1 Land Tenure Summary

Table 1: Summary of Land Tenure to which the OMP applies

| Lot                      | Plan    | Tenure         | Local Government Area  |
|--------------------------|---------|----------------|------------------------|
| 1                        | RP27759 | Freehold       | Sunshine Coast Council |
| 2                        | RP27760 | Freehold       | Sunshine Coast Council |
| 37                       | C3147   | Freehold       | Sunshine Coast Council |
| Mooloolah River corridor |         | water casement | Sunshine Coast Council |

## 1.6 Offset Management Contact Details

For the life of the OMP, information regarding the proposed works and maintenance of the offset area can be obtained from:

Coordinator Natural Areas Management

Sunshine Coast Council

Nambour Q

5475 7272

For the life of the OMP, information regarding TMR actions relating to the offset area can be obtained from:

Environmental Officer

Department of Transport and Main Roads

Maroochydore Q

5451 7055

## **2. Site Background and Environmental Features**

### **2.1 Site History**

The broader LMRE Reserve, including the offset area, has historically been developed for grazing purposes, with portions of the land subject to excavation and filling. The LMRE Reserve was purchased by SCC in 2011 for environmental purposes as outlined in Section 1.2. Since SCC's purchase, Council has developed a Vegetation Management Plan (VMP) for the LMRE Reserve (Stringybark Consulting, 2012).

Activities SCC has undertaken on the property since its purchase include:

- An agistment arrangement to assist in vegetation and weed management;
- Slashing of the main track; and
- Some targeted minor weed management activities.

### **2.2 Catchment Position and Topography**

The broader LMRE Reserve, including the offset area, is situated immediately adjacent to the confluence of Sippy Creek and Mooloolah River, with tidal influences evident in some sections of the north-eastern boundary of Lot 2. Mooloolah River is a meandering alluvial system with several oxbows and cut banks along Lots 1 and 2. Marine muds and mangrove communities line the banks adjacent to the north-eastern boundary (outside the offset area), with open sandy alluvium cut batters actively eroding through the southern boundary of Lot 1.

Topography for the offset site is very gently sloping from the north-west to the south and east. Five to six metres of elevation (AHD) occurs along the western boundary of Lot 1 falling down to approximately 3-4 metres by its eastern boundary, whilst almost all of Lot 2 is less than two metres AHD. Lot 2 is a mosaic of a low lying flood plain, shallow drainage lines and wetland areas.

### **2.3 Habitat Context**

The LMRE Reserve provides important habitat linkages within the broad landscape, with wetlands to the east at Birtinya, Palmview Conservation Park to the south and west and Mooloolah River National Park, Mooloolah River section to the north. In the longer term, there is the potential for significant private development in areas surrounding the LMRE Reserve. These include sand extraction activities from Caloundra Road to the Ring Road south of the property and urban development in the Palmview and Birtinya/Kawana Forest areas (east and west of the site). These actions will see the LMRE Reserve (as a whole, including the offset area) represent the largest open grazing/wetlands for the region (Stringybark Consulting, 2012).

The vegetation along Mooloolah River within the offset area provides connectivity along this important watercourse and will strengthen the buffer to this watercourse over the period of this offset obligation.

## 2.4 Vegetation Descriptions

The offset area is mapped under the Regulated Vegetation Management Map (Attachment 4) as supporting both Category X (vegetation not regulated under the *Vegetation Management Act 1999*) and Category B (remnant vegetation) areas. Areas mapped as containing remnant vegetation occur only along the Mooloolah River, which borders the southern and eastern sections of SCC landholdings. Some remnant vegetation also occurs in the north and central sections of the LMRE Reserve. The Department of Natural Resources & Mines (NRM) Vegetation Management Supporting Map (Attachment 4) identifies remnant vegetation to comprise of Regional Ecosystem (RE) 12.3.1, which is endangered and described as gallery rainforest (notophyll vine forest) on alluvial plains. This vegetation occurs along the Mooloolah River and the eastern section of Sippy Creek. The centre of the LMRE Reserve and the south-western boundary of Lot 37 C3147 (Sippy Creek) comprises of RE 12.3.5 and is described as *Melaleuca quinquenervia* open forest on alluvium.

### 2.4.1 Vegetation Condition

Substantial parts of the Mooloolah River corridor have been confirmed as RE 12.3.1, with components of RE 12.3.5 also present (RPS, 2016). Many of the areas have a history of grazing and the understorey is often in poor condition, with numerous weeds present.

Vegetation assemblages of high ecological value are associated with the riparian areas along Mooloolah River and the regrowth *Melaleuca* wetland communities in the eastern part of the site. Generally the site displays many areas of very high natural regeneration capacity despite the history of disturbance and agricultural use. There are a number of significant weed populations noted, most associated with the riparian remnant areas along the Mooloolah River. Weeds that are known to occur on the LMRE Reserve include groundsel (*Baccharis halmifolia*), lantana (*Lantana camara*), camphor laurel (*Cinnamomum camphora*), broad-leaved peppertree (*Schinus terebinthifolius*), Singapore daisy (*Sphagneticola trilobata*) and African tulip tree (*Spathodea campanulata*) (RPS, 2016; Stringybark Consulting, 2012; and Eco 9 Consulting, 2011).

A detailed biocondition assessment of the offset area has not been undertaken, however based on observations of key functional attributes of species recruitment, weed coverage, the number of large trees observed, the height and coverage of the canopy and the assessment undertaken of the impacted LRSA TEC within the Project area, the offset site is currently (July 2016) considered to be between a 0.40-0.59 (biocondition value) (refer to Attachment 3 for site condition criteria). Based on this assessment, a condition score of 5 (refer Attachment 3) has been attributed to the offset area as the “start value” for the vegetation on the site.

### 2.4.2 Flora of Conservation Significance

The Richmond Birdwing Butterfly vine (*Pararistolochia praevenosa*) is a climbing plant which is the exclusive food plant for caterpillars of the Richmond Birdwing Butterfly (*Ornithoptera richmondia*). Two individual Richmond Birdwing Butterfly vines (listed as near threatened under the *Nature Conservation Act 1992*) were identified by Eco 9 Consulting (2001) as occurring within the remnant RE 12.3.1, along the southern boundary of the adjacent Lot 37.

## 2.5 Cultural Heritage

### 2.5.1 Aboriginal Cultural Heritage

A search of the Department of Aboriginal and Torres Strait Islander Partnerships (DATSIP) database on 20 February 2017 identifies the Kabi Kabi First Nation as the cultural heritage party for this area. There is an artefact scatter located

within the road corridor in the southern section of Lot 37 C3147. In addition, there are several known sites located within the broader landscape surrounding the LMRE Reserve and as such all parties working under this OMP need to exercise their duty of care under the *Aboriginal Cultural Heritage Act 2003*.

## 2.5.2 Historic Cultural Heritage

There are no records of historic cultural heritage site within or adjacent to the offset area or the LMRE Reserve.

# 3. Opportunities and Constraints

## 3.1 Regeneration and Revegetation Success

The offset area is part of a broad alluvial floodplain which retains high soil moisture content for much of the year. Observation of this site over the past fifteen years has confirmed that pioneer species such as *Acacia melanoxylon*, *Macaranga tanarius*, *Eucalyptus tereticornis* and *Glochidion sumatranum* recruit readily along the riparian areas of Mooloolah River, with the ephemeral areas or slightly elevated sites responding with *Acacia melanoxylon*, *Corymbia intermedia*, *Lophostemon suaveolens*, *Eucalyptus tereticornis* and *Melaleuca quinquenervia*.

The resilience and natural regenerative capacity of parts of the offset area which have been disturbed only in the last 10-20 years are therefore considered to be very high.

## 3.2 Fire Management

The broader LMRE Reserve surrounding the offset area comprises of regrowth bushland vegetation dominated by melaleucas and eucalypts, with some areas of mangrove on the LMRE Reserve's north-eastern boundary. These adjacent areas have the potential to provide fuel for bush fires, which could threaten the area of rehabilitation, natural regeneration and protection of future LRSA vegetation community.

At this early stage of the project, the vegetation adjacent to the offset area lacks understorey and is subject to cattle grazing activities therefore providing little fuel. Once the OMP activities commence and become more established in the later part of this project, the planted trees may themselves become a source of fuel.

An intense bush fire in the adjacent areas or within the offset area itself has the potential to result in broad-scale loss of planted and regenerating trees. However, much of the anticipated fire risk is expected to be mitigated through ongoing cattle grazing on adjacent land (that is, the remaining portions of the LMRE Reserve) and potentially through the establishment of fire breaks adjacent to the offset area and/or throughout the LMRE Reserve.

Monitoring of fire fuel loads will be an important component of the bushfire management strategy, particularly in areas directly adjacent to the offset area. This fuel load monitoring in areas adjacent to the offset area will be the responsibility of SCC, whilst monitoring within the offset area will be the responsibility of the relevant contractor for the ten year management period. If fuel loads in either area are determined to be of a significant level TMR and/or SCC will work with the relevant organisation(s) to reduce the fire risk and if necessary develop a separate fire management plan.

A number of firebreaks and access tracks are located in the remaining areas of the LMRE Reserve. Firebreaks and access tracks in these adjacent areas will be maintained by SCC to ensure the security of fire breaks and management of any other hazards.

### 3.3 Infrastructure/Access

Lot 1 RP27759 and Lot 37 C3147 have identified road corridors (in custodianship to SCC) that sever the southern sections of these allotments. These road corridors are identified in Figure 3. SCC has committed to closing the extent of these road corridors, as identified in Figure 3. The areas in blue in Figure 3 are required by TMR to be closed for the ongoing protection of the offset area, whilst the areas of the road corridors shown in green in Figure 3 will be closed by SCC to provide additional protection to the offset site.

From conversations with NRM and SCC an additional 'floating road corridor' is known to be attached to the title of Lot 1 RP27759. The intention of this floating road corridor is thought to enable connection between the road corridor identified on the boundary of Lot 112 NPW1102 (property adjacent to Lot 1 RP27759, north of LMRE Reserve) and the road corridor in the south of Lot 1 RP27759 (as shown in Figure 3). This floating road corridor will be closed by SCC to further enhance the environmental values of the broader LMRE Reserve.

Lot 37 C3147 also has an identified power line easement in close proximity to Zone 1 within this lot. This easement is to be maintained.

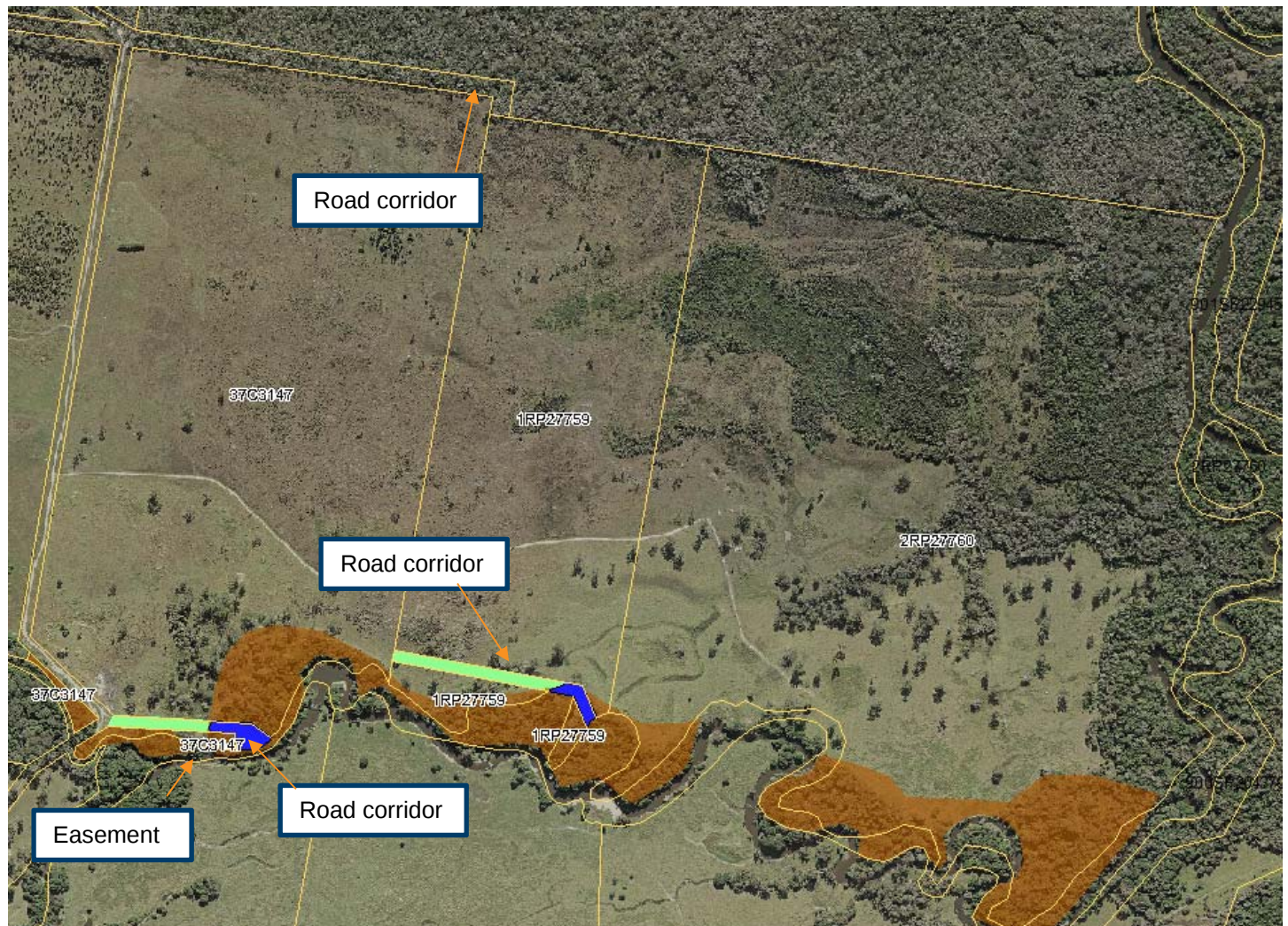


Figure 3: Road corridors and easements associated with Lot 1 RP27759 and Lot 37 C3147

TMR is currently investigating access and permission requirements for the offset areas located within the Mooloolah River corridor, outside the LMRE Reserve. The aim of these investigations is to allow SCC to undertake the required offset areas works within the Mooloolah River corridor.

## 3.4 Security

In accordance with the EPBC approval and outlined in Section 1.3, the offset area within the LMRE Reserve must be protected in perpetuity from future development impacts. The mechanism to provide this protection is currently being negotiated with DoEE and TMR will inform SCC of the requirement upon conclusion of this negotiation.

A copy of the relevant protective mechanism is to be provided by SCC to TMR as outlined in the Offset Agreement.

There may be additional processes TMR and SCC need to follow to secure the full offset area as discussed in Section 3.3.

## 4. Rehabilitation Elements

### 4.1 Rehabilitation Measures

The following table provides a summary of the identified key management objectives and measures for the rehabilitation program for the offset area.

Table 2: Management Objectives

| Management Goal       | Objective                                                                                                                              | Means of Achieving Objectives                                                                                                                                                                   | Measure of Success                                                                                                                                                                                                     |
|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Weed Control          | To increase biodiversity of the site by removing invasive weed species and progressively replacing exotic species with native species. | Removal and control of noxious and environmental weeds using appropriate methods. Ongoing weed removal.                                                                                         | Control weed populations to permit natural regeneration of native species. Monitoring of weed populations over a ten year period demonstrating a significant reduction of weed dominance and increased native species. |
| Natural Regeneration  | To improve the ecological integrity of the site and re-instating LRSA TEC (Attachment 1) by encouraging natural regeneration.          | Identify, protect and encourage natural recruitment.<br><br>Ongoing weed management within these regrowth patches to ensure the success of new recruits.<br><br>Withdrawal of existing grazing. | Successful natural establishment of native seedlings – particularly pioneer species.<br><br>Revegetation in relevant locations through natural recruitment.                                                            |
| Assisted Regeneration | To accelerate natural recruitment to existing riparian remnant areas through targeted reinforcement planting (revegetation) and        | Exclude grazing from identified regeneration areas.<br><br>Undertake small scale random space plantings designed to support natural regeneration and                                            | Pioneer/successional planting by end of second year of the ten year management period.<br><br>Ongoing monitoring of areas for intervention (reinforcement)                                                             |

| Management Goal                 | Objective                                                                                                                                    | Means of Achieving Objectives                                                                                                                                                                                                                                                                              | Measure of Success                                                                                                                                                                              |
|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                 | suitable ground disturbance activities.                                                                                                      | remnant patches – particularly along Mooloolah River.                                                                                                                                                                                                                                                      | plantings throughout the ten year management period.                                                                                                                                            |
| Habitat Enhancement/Maintenance | To improve the ecological value and richness of the site.<br><br>To maintain identified existing opportunities for fauna.                    | Removal of all unnecessary fauna barriers such as fences and creation of restricted access by cattle to the offset area.<br><br>Increase native plant cover, including encouragement of natural regeneration to link remnants on the site. Continue ongoing weed management within these regrowth patches. | Native plant cover on the site maximised and increased, where possible.<br><br>Removal of native fauna movement barriers within the site.                                                       |
| Erosion Controls                | No worsening of observed surface scour and erosion occurring on the site, with a preference for a reduction in the observable erosion sites. | Removal of all unnecessary fences and exclusion of cattle from the offset area.<br><br>Stabilisation of erosion occurring in the riparian areas of Mooloolah River through stabilisation plantings.                                                                                                        | No observable surface scour or erosion during normal flow period by the end of the ten year management period.<br><br>Establishment and stabilisation of river bank through riparian plantings. |
| Pest Management                 | Capacity of natural recruitment of native species through the removal or exclusion of pest animals, such as hares, pigs.                     | Monitor impacts of pest animals on naturally regenerating areas and undertake actions to reduce negative impacts during establishment.                                                                                                                                                                     | Native plants (planted or naturally regenerated) survive beyond establishment and to an age where occasional browsing does not impact their survival.                                           |

## 4.2 Rehabilitation Treatment Zones

Treatment zones across the broader LMRE Reserve have been prescribed by SCC, as shown in Figure 4, and this has been adopted for the purposes of this OMP. This OMP will deliver works/actions outlined for Zones 1 through to 10 (Figure 4). The rehabilitation zone attributes of relevance to this OMP are outlined in Table 3 below.

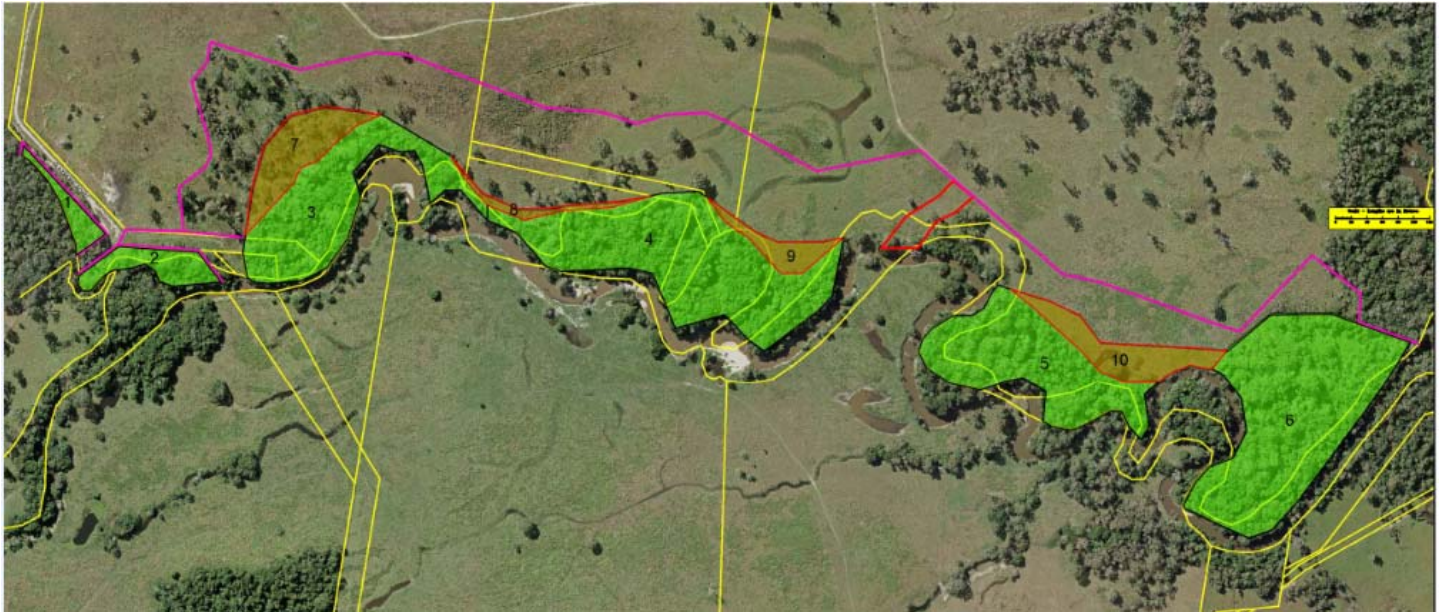


Figure 4: Treatment zones for the environmental offset within the LMRE Reserve

Table 3: Rehabilitation Zone Attributes

| Zones       | Rehabilitation Goal/ Target RE                                                                                  | Management Requirements and Attributes                                                                                                                                                                                                                      | MAPPING NOTES<br>Area Design<br>Constraints/Considerations/Justification                                                                                                                                                                                                                                                                                |
|-------------|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>1-6</b>  | Lowland Subtropical Rainforest of Australia<br>TEC<br><br>RE 12.3.1 - (Notophyll vineforest on alluvial plains) | Remnant/regrowth – requires assisted natural regeneration management approach.<br><br>Ongoing monitoring for weeds and pest management.<br><br>Riverbanks require weed management and some reinforcement/stabilisation plantings anticipated to 1% of area. | Canopy in sound condition. The understorey is expected to recover rapidly following removal of stock. Some areas needing intervention for erosion or stabilisation works where no canopy exists or understorey has been damaged by stock and is eroding.<br><br>0.35ha in Zone 6 requires reinforcement planting due to historical vegetation clearing. |
| <b>7-10</b> | Lowland Subtropical Rainforest of Australia<br>TEC<br><br>RE 12.3.1 - (Notophyll vineforest on alluvial plains) | Regrowth and pasture area – requires reconstruction (revegetation) approach.<br><br>Ongoing monitoring for weeds and pest management.                                                                                                                       | This is a priority buffer to the remnant riparian vegetation along Mooloolah River.<br><br>These areas contain a number of relic canopy trees, however the natural regeneration and resilience is poor.                                                                                                                                                 |

### 4.3 Revegetation Strategy

The main aim of the revegetation strategy for the offset area is to meet the relevant conditions of approval as outlined in Section 1.3 by the end of the OMP period (as outlined in Section 1.4), with a specific emphasis on re-establishing remnant LSRA TEC and improving the offset area in accordance with the condition improvement referenced in Attachment 3.

The offset site is considered to contain significant native seed bank with tall canopy remnants occurring in varying densities across the site. On this basis, weed management to support natural regeneration combined with reinforcement tubestock planting is considered the most viable approach to revegetation.

The overall strategy for the revegetation of identified areas is to:

- Remove regeneration limitations, such as fencing to prevent stock access, remedy erosion and reduce weed populations;
- Encourage natural regeneration to establish the LRSA TEC;
- Provide tubestock pioneer (random spacing) to support natural regeneration areas;
- Support natural regeneration with ongoing targeted weed management; and
- Provide reinforcement plantings to accelerate success of natural regeneration.

### 4.3.1 Intervention Criteria

Within the identified rehabilitation zones, some patch scale reinforcement plantings may be required. In consideration of the time that has elapsed since the site was slashed in 2009 and has been subject to grazing pressure a decision making criteria for intervention is provided.

Specifically, the decision making criteria listed below are provided to determine when reinforcement plantings are required after grazing removal and other land management measures. An assessment, in line with this decision making criteria, must be made by a revegetation specialist to determine required actions.

#### Remnant and Regrowth Areas Criteria

- All remnant and regrowth areas are to be subject to stabilisation plantings in any areas which is actively eroding or lacking flora species or structural integrity.
- Any remnant or regrowth areas where closed canopy does not exist are to be subject to patch scale reinforcement plantings (as per Table 3) utilising a pioneer/successional planting approach (refer to Section 4.6.4).

### 4.3.2 Target Vegetation

In line with the Project's requirements, the offset area shall be rehabilitated to match the 'description, key diagnostic characteristics and condition thresholds' of the LRSA TEC (Attachment 1) at the end of the OMP period (Section 1.4). Section 4.2 provides guidance related to revegetation activities, plantings and target vegetation for each zone within the offset area to assist in reaching the primary aim of the offset.

## 4.4 Natural Regeneration

The most significant impediments to natural regeneration on the site are impacts from grazing, competition from weeds and limitations of soil resources (topsoil condition, soil moisture levels, and seed sources). Pest and weed management is discussed further in Section 4.5 and detailed discussion relating to the arrangements for the removal of competition from stock is discussed in Section 4.7.1. Section 4.6 discusses improvements in soil conditions, although primarily in the context of active rehabilitation rather than natural regeneration. Moreover, for the ten year management period of this OMP, it is likely that revegetation activities will rectify soil deficiencies, where required, rather than requiring soil management intervention to promote natural regeneration.

## 4.5 Pest and Weed Management

### 4.5.1 Weed Management

Weed management methods on the site are anticipated to include a range of bush regeneration techniques such as, but not limited to, hand removal and chemical spray application through to stem injection of larger canopy weed species. A number of these techniques are outlined in Sections 4.5.1.1 – 4.5.1.6.

Understorey weed species in small pockets of regrowth vegetation are best managed slowly over time, utilising bush regeneration techniques to permit the minimum disturbance necessary to native plants in these areas. All weed removal methods and treatment methodology should be consistent with the:

- South-east Queensland Ecological Restoration Framework: Manual (2012);
- SCC's Sunshine Coast Local Area Pest Management Plan (2012) or replacement;
- best practice;
- relevant advice through Biosecurity Queensland website; and
- APVMA Minor Use Permit (PER 11463v4) or any other updated or relevant APVMA permits.

Table 4 provides control method advice for species which have been identified as key weed species needing to be managed during the ten year management plan period. It should be noted that these are only key species and that a continuous adaptive management approach should be adopted by the contractors on site to manage other weed species that occur within the offset area, including any new species (or management techniques) during the term of the OMP (Section 1.4).

Table 4: Weed Management and Control Actions

| Plant Name                               | Status <sup>2</sup>       | Control Method                                                 | Timing                                                                                                                          | Site Notes                                                                                                                         |
|------------------------------------------|---------------------------|----------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|
| Lantana ( <i>Lantana camara</i> )        | Restricted Invasive Plant | Hand removal<br>Low volume foliar herbicide treatment          | Lantana seeds prolifically and can be treated throughout the warmer months of the year.                                         | Remnant patches are a priority, particularly Zones 1 and 6.                                                                        |
| Pine ( <i>Pinus elliottii</i> )          | Environmental weed        | Hand removal - Felling<br>Stem Injection – herbicide treatment | Physical removal can occur throughout the year, but stem injection for larger trees is most effective during the warmer months. | Eradication of this species is anticipated with limited effort, as few mature seed sources remain and adjacent to the offset area. |
| Mist flower ( <i>Ageratina riparia</i> ) | Environmental weed        | Hand removal<br>Low volume foliar herbicide treatment          | Treatment needs to occur prior to full flowering in August to October.                                                          | Plant occurs in dense sheltered and moist regrowth patches. Seeds are transported by wind and running water in gullies.            |

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<sup>2</sup> Status in accordance with the *Biosecurity Act 2014*

| Plant Name                                                      | Status <sup>2</sup>          | Control Method                                                     | Timing                                                                                                                          | Site Notes                                                                                                                                                                                          |
|-----------------------------------------------------------------|------------------------------|--------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Camphor laurel<br>( <i>Cinnamomum camphora</i> )                | Restricted<br>Invasive Plant | Hand removal – felling<br><br>Stem injection – herbicide treatment | Physical removal can occur throughout the year, but stem injection for larger trees is most effective during the warmer months. | A single individual is identified in Zone 1 of Lot 1. Eradication of this species is anticipated with limited effort, as only a few mature seed sources remain on and adjacent to the LMRE Reserve. |
| African tulip tree<br>( <i>Spathodea campanulata</i> )          | Environmental<br>weed        | Hand removal – felling<br><br>Stem injection – herbicide treatment | Physical removal can occur throughout the year, but stem injection for larger trees is most effective during the warmer months. | Eradication of this species is anticipated with limited effort, as few mature seed sources remain on and adjacent to the LMRE Reserve.                                                              |
| Singapore daisy<br>( <i>Sphagneticola trilobata</i> )           | Restricted<br>Invasive Plant | Low volume foliar herbicide treatment                              | Control can occur at any time as the plant reproduces mostly through cuttings and transportation such as slashers.              | Do no permit slashers near infected areas.<br><br>If used, care in the application of sulfonyurea herbicides such as Metsulfuron-methyl, particularly around wetlands.                              |
| Broad-leaved pepper tree<br>( <i>Schinus terebinthifolius</i> ) | Restricted<br>Invasive Plant | Hand removal – cut and swab                                        | Hand remove or swab larger plants in winter.                                                                                    | Mostly associated with the remnant areas along Mooloolah River. This species is anticipated to recruit through avian vectors.                                                                       |

The contractor will be responsible for the management of restricted invasive plants and environmental weeds within the offset area that impede the growth of any areas of natural regeneration or rehabilitation covered by this OMP. SCC will be responsible for the management of invasive plants and environmental weeds that are not covered by this OMP within the broader LMRE Reserve and within the offset areas (that is, after the ten year management period).

The successful contractor is responsible for monitoring weed populations and intrusions within the offset area and managing them in accordance with the natural regeneration and revegetation principles. For all restricted invasive plants, these shall be treated and/or directly removed from within the offset area to ensure there are no populations of these plants at the end of the ten year management period. The Contractor must demonstrate reduced populations/sizes of weed invasions within the offset area at each reporting period.

#### 4.5.1.1 Slashing Maintenance

Ongoing slashing will be undertaken on internal maintenance tracks and external fences. The use of slashing (particularly once stock is removed from offset area), may be intermittently used to control woody weeds for management of minor site access tracks.

#### 4.5.1.2 Hand Removal

Hand removal is the preferred method of weed removal within sensitive areas such as drainage lines within the offset area or around regrowth vegetation pockets, particularly where it is determined that herbicide application may result in damage to native groundcovers or amphibians. Many plants that will not regrow from their roots (for example, many grasses and pine tree seedlings) can also be cut at the base or “crowned” by hand or brushcutter for removal. This method is the most labour intensive but provides excellent low impact targeted results with a minimum of soil disturbance. Hand removal and bagging onsite particularly prior to flowering onset is also the preferred method with highly invasive or noxious weeds, or where other removal methods may still result in the propagation of the plant through seed or vegetative material.

#### 4.5.1.3 Stem Injection

Treatment of larger woody weeds and scrambling or climbing weeds can be achieved by using stem injection approach. Drilling holes around the trunk of the trees and filling the holes (or injecting with specialist injection tubes) immediately with herbicide, provides a simple method of removing unwanted species particularly amongst mature native remnant trees. Stem injection is the recommended technique to manage larger camphor laurel (*Cinnamomum camphora*) and African tulip tree (*Spathodea campanulata*) identified in the remnant RE 12.3.1 areas of Lot 1.

#### 4.5.1.4 Cut and Swab

Plants such as broad-leaved pepper tree (*Schinus terebinthifolius*) can be cut to reveal as much of the stem areas as possible and the cut area painted immediately with herbicide. This technique is known as “cut and swab”.

These bush regeneration techniques have the benefit of being targeted and can be used to clear large areas of woody weeds without affecting surrounding native vegetation. These methods can be considered labour intensive but they are anticipated to be used throughout the ten year maintenance term to achieve good weed management results in the offset area.

#### 4.5.1.5 Foliar Herbicide Applications

Low volume herbicide applications through the use of knapsacks is suitable for control of grasses, groundcovers and juvenile woody weeds. Where possible the use of amphibian-friendly glyphosate formulations are recommended for use on the site as these formulations limit or exclude toxic surfactant additives. Application is typically carried out by 15 litre knapsack, with herbicides prepared in accordance with manufacturers' specifications and applicable permits (refer to products' SDS).

#### 4.5.1.6 Vehicle Clean Down

All vehicles including slashers must be subject to site access inspections and appropriate weed seed removal and hygiene protocols prior to accessing the site. More specifically, a weed control point will be used prior to entering and upon exiting the offset area or the LMRE Reserve (whichever is most appropriate) to minimise the spread of restricted invasive plants. This is an important factor in minimising risk of weed recruitment on the site, importation of other organic material and soil pathogen relocation.

#### 4.5.1.7 Personnel

All weed management activities outlined in Section 4.5.1 shall be undertaken by suitably qualified persons and those staff/contractors handling and treating weeds with herbicides shall hold all appropriate licences and/or permits.

### 4.5.2 Pest Management

Introduced animals have been observed or are anticipated to occur on the site and may be of concern to the long term maintenance of biodiversity. These include red fox (*Vulpes vulpes*), European rabbit (*Oryctolagus cuniculus*), wild cats (*Felis catus*), wild dog/dingo crosses (*Canis familiaris*), cane toads (*Rhinella marina*) and possibly wild pigs (*Sus scrofa*).

All of these pest animals are restricted invasive animals under the *Biosecurity Act 2014* and all are prescribed for management under SCC's Local Government Area Pest Management Plan (2012) or replacement.

Queensland Parks and Wildlife Service and SCC maintain trapping programs and baiting throughout rural areas of SCC and in National Parks for pest species. These programs are likely to continue throughout the term of the OMP (refer to Section 1.4) and subject to their own timing, program, regulation and monitoring.

In addition, kangaroo and wallaby species are likely to be present on site and may pose threats to planted stock, particularly prior to their establishment. As part of the establishment for plantings the use of recognised deterrents will assist in reducing the potential threat of browsing.

The offset area is not within a Red Imported Fire Ant mapped area, but all parties shall be responsible for ensuring no materials and/or plants have the potential to or actually bring Red Imported Fire Ants to the area of works.

## **4.6 Reinforcement Plantings**

Some reinforcement plantings in areas that are not naturally regenerating may occur in the offset site (as outlined in Section 4.3.1). The planting strategy for these areas is anticipated to be randomly spaced tubestock plantings. Planting activities are to utilise local species only with arrangements and densities consistent with the species outlined in the listing advice for LRSA TEC (Attachment 1) and utilise a pioneer and successional planting approach (refer to Section 4.6.4).

### **4.6.1 Planting Program Considerations**

Where planting is required, it should not occur in unsuitable weather conditions such as extreme heat, extreme cold, extreme wet (flooding or saturated soils) or in windy weather, where possible. All plantings should occur once sufficient soil moisture is present.

Tubestock should be local native plants suited to the identified planting zone (refer to Attachments 1 and 4). Plants should be ideally sourced locally or grown from seed or cuttings from local provenance. Tubestock may be mulched using sterile sources of sugar cane mulch or jute planting mats.

### **4.6.2 Site Preparation**

Cultivation of soils may be undertaken by preparing individual tubestock locations for planting. Site preparation for revegetation works may include strip or spot herbicide applications, manual removal and pasture slashing activities to maximise the growth potential from planted tubestock. Blanket spraying of large areas of the offset area prior to any tubestock planting may exacerbate weed recruitment and erosion events and therefore is not preferred. Ongoing weed management efforts are anticipated to provide appropriate management of weeds in revegetation areas.

### **4.6.3 Soils Tests**

Give the historical use of the site, preliminary soil tests are to be undertaken to set a baseline of soil condition and composition prior to planting works. Physical and chemical analysis undertaken by a NATA accredited soil analysis laboratory, may be useful to inform the requirements of planting hold fertilisation or amelioration to benefit plant establishment.

### **4.6.4 Pioneer and Successional Planting**

If broad-scale planting is required, it is recommended as a two staged method with a pioneer species planting, followed by a secondary planting of slower growing or shade preferring successional species once a canopy is established.

Successional plantings under the canopy of the pioneers is then undertaken as a follow-up activity. Thinning of some of the pioneer species may be necessary during successional planting works. This approach offers the benefit of a rapid canopy establishment and should result in diminishing the weed management requirements in rehabilitation areas.

## **4.6.5 Species Selection and Planting Density**

Plant species are to be chosen from the suite of species identified as key species in LRSA TEC (Attachment 1) or relevant to providing appropriate conditions for the species identified in Attachment 1.

Species outlined in the listing advice for the LRSA TEC provided in Attachment 1 should be utilised to determine appropriate replacement species.

## **4.6.6 Tubestock Protection**

Protection for newly planted tubestock is anticipated to comprise two strategies tailored to the planted stock species and the time of planting. The two strategies are: no tree guard (just ring mulch or jute mate) or rigid tree guard or jute mat. Protection from wind as well as grazing by native and introduced species (refer to Section 4.5.2) are anticipated to be an issue. It is recommended the revegetation contractor apply anti-transpirant and faunal deterrent products, as specified by SCC, to address these risks. Highly palatable species and frost sensitive species (particularly emergent species) should be planted with tree guards.

## **4.6.7 Stabilisation Works**

Larger areas of eroding banks may require additional stabilisation such as sowing cover crops (sterile varieties) and high density plantings. Naturally stable banks of this section of Mooloolah River often display high densities of *Lomandra hystrix* and *Ficus coronata*, which is the recommended approach for stabilisation plantings. These species will assist to bind sediments together and in the longer term form a surface root mat which reduces the erosive risk from flowing surface waters. Densities of four plants per square metre are recommended for planting in these areas, although the locale and fauna species habitat requirements shall be considered when developing and implementing planting strategies along the Mooloolah River.

## **4.6.8 Mulch Treatments**

Imported organic mulches such as certified weed free sugar cane mulch may be considered for the use for ring mulching of new plantings. Alternatively, individual planting “mats” made from jute materials or similar are readily transportable may be utilised. Drought tolerant species when planted with protection devices such as the jute mats can thrive with minimum follow-up maintenance and can readily establish a canopy.

## **4.6.9 Planting Stock Survival and/or Replacement**

Ongoing monitoring of rates of natural regeneration as well as survivorship of new plantings should be undertaken. All failed plantings should be subject to site analysis to determine the reasons why the failure occurred then replacement with appropriate planting stock as soon as is practicable is to be undertaken. Plant protection measures (tree guards or similar) should be installed if plant predation is occurring. Measures taken to ameliorate the identified failure reasons (stock access, dehydration, scour or erosion, and so on) should be undertaken prior to installing the replacement plantings.

# **4.7 Other Site Management**

## **4.7.1 Management of Stock and Site Access**

An important objective for the rehabilitation of the site is to exclude stock from all remnant and regrowth areas of the offset site including Mooloolah River riparian zone. This requires the creation of new fencing arrangements to contain stock outside of the areas covered by this OMP.

Due to the historical use of the broader LMRE Reserve, including accessible locations within the offset area, a few relic fences and gate access points remain. It is considered appropriate to undertake the removal of fences within the offset area. The most significant historical fenceline which requires removal is located across the southern section of Lot 1 RP27759.

The strategy for stocking/agistment leases for the remainder of the property, outside of the offset area, must consider:

- Prohibition of access of stock to all natural regeneration/revegetation areas;
- All vehicles to use defined site access points and established maintenance access tracks only;
- No stock mustering to occur within the offset area.

Areas requiring fencing to restrict cattle access to rehabilitation/regeneration activities will need to be fenced in a manner that is 'fauna friendly'. The following are design considerations for fauna friendly cattle fence:

- Ironbark split posts at seven metre spacings
- Plain wires (no barbs)
- 2 x Waratah horse sighter and 3 x Waratah 2.5mm high tensile
- Ironbark 8ft strainers
- 100mm x 100mm x 3.0m H4 treated stays
- Wire dropper in between split posts
- A 30-50cm gap from the ground level to the first strand of plain wire is the best solution for smaller terrestrial fauna movement;
- Consider the installation of a high visibility top strand or flagging to areas adjacent to feeding trees, wetlands or watercourse;
- Provide a 300-400mm gap in the fence between two hardwood posts or install a single section of post and two hardwood rail fencing for fauna movement. This provides a kangaroo/wallaby/bandicoot access particularly at identified movement corridors or inflection points. This gap is large enough for wildlife but too small for full size cattle to move through.

Ongoing monitoring in relation to fenceline visibility and integrity must be undertaken as part of the site monitoring program.

## **4.7.2 Site Waste Management**

The disposal of chemical residue or spray washout is not permitted adjacent to any of the waterbodies or watercourses within or adjacent to the site. General rubbish, including any waste materials associated with the delivery of this OMP, must be removed and appropriately disposed of offsite. All materials should be temporarily stored/delivered to an identified staging area prior to works, as required. There is to be no site runoff or waste materials stockpiled on the site without appropriate containment and potential treatment.

## **4.8 Rehabilitation Action Prioritisation**

The process of prioritising rehabilitation activities and management areas is to be guided by:

- Placing high priority on actions that result in maximising natural regeneration of the site (such as stock management, including fencing);

- Placing higher priority on fabrication (planting) in areas where existing regrowth vegetation is occurring and regenerative response is anticipated to be high;
- Area geometry in proximity to remnant or regenerating native vegetation;
- Proximity or relationship to a drainage line/watercourse or wetland; and
- Implication of access and ability to maintain planted areas.

Table 5 provides the priority for rehabilitation actions and areas within the offset area. It should be noted that despite the prioritisation of treatment areas, broadly the two most fundamental priorities for the site remain the establishment of the new stock fencing to exclude cattle from regeneration areas and secondly the ongoing management of weeds on the site.

Table 5: Rehabilitation Works Prioritisation

| Priority | Key Action                                                              | Area Identified                                | Timeframe | Notes                                                              |
|----------|-------------------------------------------------------------------------|------------------------------------------------|-----------|--------------------------------------------------------------------|
| 1        | Stock Fencing                                                           | All areas                                      | Year 1    | Installation of new boundary fenceline.                            |
| 2        | Intensive Weed Management                                               | All Remnant and Riparian Areas (Zones 1 and 6) | Year 1    | Targeted removal of species identified as key species in this OMP. |
| 3        | Stabilisation and Reinforcement Revegetation Plantings – Riparian Areas | All Remnant and Riparian Areas (Zones 1 and 6) | Year 1-2  | Stabilisation plantings and reinforcement plantings.               |
| 4        | Ongoing Weed Management                                                 | All Areas                                      | Ongoing   | Ongoing weed management in accordance with this OMP.               |
| Ongoing  | Rubbish Removal and Site Management                                     | All Areas                                      | Ongoing   | Progressive removal of all anthropogenic rubbish                   |

## 5. Offset Management Program

### 5.1 Management Strategy and Objectives

The objective for the offset area is to meet the conditions of approval outlined in Section 1.3. These objectives will be met through the management of areas of remnant vegetation (LRSA TEC) and areas of natural regeneration to a stage of canopy closure, with minimal intervention. Weed suppression activities on the site will be an ongoing key focus, which is anticipated to decrease as native plant dominance increase and the pioneer species achieve an interlocking canopy to provide shade to the understorey.

The identified tasks for OMP period are:

- Protect existing areas of LRSA TEC;
- Encourage natural regeneration already occurring on the site to encourage the re-establishment of LRSA TEC (as described in Attachment 1);
- To monitor fencing performance;

- Undertake a targeted ongoing weed management program to support natural regeneration and revegetation areas and to suppress identified restricted invasive plants and environmental weed species;
- To monitor the stability of the Mooloolah River banks for signs of improvement in bank stability and erosion rates, following de-stocking and reinforcement plantings; and
- To implement land management practices that bolster and support the natural regeneration/revegetation of the offset area.

Table 6 Activity schedule is provided to detail the tasks, timeframes and proposed actions for the offset area in the context of the proposed rehabilitation works.

Table 6: Management and Maintenance Activity Schedule

| Task                                        | Timeframe/Frequency                                                                                | Activities                                                                                                                                                                                                                                                                                                        |
|---------------------------------------------|----------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Weed Management                             | When required throughout the ten year management period, in accordance with seasonal requirements. | Seasonal and pre-emptive weed control, based upon specific species lifecycle. Suggested higher monitoring frequency through the warmer months than in winter. Visually verify weed management works and the progress of natural recruitment. Monitor weed population densities and adaptive management responses. |
| Mowing/Slashing                             | As required.                                                                                       | Mow all access track areas and buffers fence lines relevant to the offset area, as required.                                                                                                                                                                                                                      |
| Fire management                             | Annually or as required, dependent on weather conditions and vegetation growth.                    | Management of fire breaks outside the offset area and access tracks.<br>Implement in relevant rehabilitation areas to assist natural regeneration                                                                                                                                                                 |
| Boundary Fences and Access Gate Maintenance | As required.                                                                                       | Maintain in safe and secure working condition.                                                                                                                                                                                                                                                                    |
| Erosion Control                             | After floods and heavy rainfall.                                                                   | Check flow paths or disturbed areas (exposed soil, tracks, and so on) for soil erosion and scouring.                                                                                                                                                                                                              |
| Rubbish Removal                             | As required.                                                                                       | Collect any anthropogenic rubbish or debris and dispose of appropriately.                                                                                                                                                                                                                                         |
| Maintain Revegetation Areas                 | As required.                                                                                       | Replace any failed tubestock treatments, removal of tubestock protection (such as tree guards or stakes, if used).                                                                                                                                                                                                |
| Rehabilitation Areas Access Management      | As required throughout the ten year management program.                                            | Progressive installation and removal of temporary access or delineation fencing based upon prioritisation program and adjacent land activities.                                                                                                                                                                   |

Activities to be undertaken in remnant and regrowth areas, as outlined above, shall be undertaken across the OMP period to improve the offset area's vegetation integrity.

## 5.2 Adaptive Management

The parties to this OMP are committed to adaptively manage the vegetation and the offset area. This includes adapting conservation and land management practices in response to results from the monitoring program (Section 5.3.2) and to unforeseen or unplanned management threats and issues, as well as to reflect advances in ecological research and land management technologies.

## 5.3 Offset Administration

### 5.3.1 Funding

TMR will fund the offset management actions outlined in this OMP within the SCC owned offset area of the LMRE Reserve for a period of ten years from the commencement of the Project. At the end of the OMP term (refer to Section 1.4) the funding requirements of the offset area will become the responsibility of SCC.

### 5.3.2 Monitoring

It will be responsibility of TMR to collect the baseline data relating to the management objectives and indicators prior to any works being undertaken. The baseline data will be collected taking into account the Biodiversity Condition Assessment (Queensland Herbarium, 2015).

The offset site shall be monitored for a period of ten years. By the 2 December 2026, the vegetation within the offset area will conform to the requirements of the Project's EPBC condition as outlined in Section 1.3 and Attachment 2. For the period of monitoring, the offset area will be monitored based on management objectives in Section 1.3 and against the baseline data collected by TMR prior to the commencement of works. Monitoring activities across the term of the OMP will take into account the requirement to achieve 'future quality with offset' condition threshold identified in Attachment 3 (that is, the vegetation condition across the site increases by two points (in the vegetation condition) by the 2 December 2026).

The establishment of timed performance indicators reflecting the requirements of Table 2 to monitor the rehabilitation activities (aimed at re-establishing LRSA TEC, Attachment 1) within the offset area will be developed SCC as part of their technical specification. The monitoring of performance indicators will be on a quarterly basis for the first year and bi-annually for the remaining period. These monitoring activities will be reported by the Contractor to SCC in accordance with the Council's technical specification.

As part of the monitoring process, six photo monitoring points are to be established throughout the offset area (Figure 2). Each photo-monitoring point will have at least four photos taken (north, south, east and west) for each reporting event. For each monitoring period, the photos will be replicated and taken in the same direction, elevation and orientation to provide photographic evidence of the information provided in the monitoring reports.

Other items to be monitored will include fuel loads (outlined in Section 3.2), compliance with the Council exclusion areas (as outlined in Section 3.3) and the offset delivery requirements.

In addition to the on-site monitoring, a suitably qualified person shall collect data relevant to the condition, quality and species composition and density of the LRSA TEC vegetation within the offset area and an off-site control location (as set up in the baseline surveys undertaken by TMR), with consideration for the condition thresholds identified in Attachment 3. This monitoring activity will occur at the end of the first year of the offset activities outlined in this OMP and at the end of year ten of the offset activities. The control site (which may also be referred to as an interim benchmark site) will be

established by TMR during the baseline surveys in an area of vegetation that conforms to the LRSA TEC of relevant condition, preferably in a protected tenure.

### 5.3.3 Reporting

TMR will provide a copy of the baseline data collected, as mentioned in Section 5.3.2, to SCC.

SCC will provide an annual report to TMR of the actions undertaken in the offset area by the 2 December of each calendar year for the term of the Offset Management Plan (Section 1.4).

Reporting will include:

- Transect information;
- All raw data collected supporting the actions outlined in this OMP;
- Photo monitoring points and associated photos;
- Indications of natural regeneration and survival of planted stock;
- Indications of tree growth;
- Weed management actions completed;
- Management objectives outlined in Section 1.3;
- Summary of management actions and how actions are on-track with meeting the obligations outlined in this document, in particular the criteria for the LRSA TEC outlined in the TSSC, 2011 listing advice (provided in Attachment 1) and the relevant EPBC conditions of approval (Section 1.3 and Attachment 2);
- Non-conformances; and
- Actions to be undertaken in the next annual period.

Annual reports and data provided by SCC will either be published directly or relevant data from these reports incorporated into TMR's annual reporting requirements to be published publically by TMR to satisfy the conditions of the EPBC Act approval related to these actions. The first annual report from SCC outlining progress of the offset works outlined in this Offset Management Plan works undertaken to TMR is due on the 2 December 2017 (the first anniversary of the commencement of the action (EPBC 2015/7464)).

### 5.3.4 Satisfaction of Offset Obligation

In accordance with the EPBC Condition of Approval for the Project the offset obligation is deemed to be satisfied when:

- The offset area is protected in perpetuity by a protective mechanism as outlined in the conditions of approval from DoEE (Attachment 2);
- The offset area demonstrates the condition thresholds outlined in Section 1.3;
- The vegetation in the offset area demonstrates compliance with the requirements of the LRSA TEC (Attachment 1) relevant to the EPBC Act conditions of approval by December 2026 and the vegetation has improved by two points in the vegetation condition score in comparison to the baseline data (see Section 5.3.2).

SCC will maintain the offset area on behalf of TMR until such time that the vegetation satisfies the Project's relevant conditions of approval (as outlined in Section 1.3 and Attachment 2) and is improved in the context of Attachment 3 (condition score) or by two points based on the baseline Biocondition Assessment (as outlined in Section 5.3.2). After such time, SCC will resume the responsibility for the offset area and will manage the area in accordance with SCC natural areas estate management practices and the tenure security.

## 6. References

Chenoweth EPLA and Bushland Restoration Services (2012). South East Queensland Ecological Restoration Framework: Manual. Prepared on behalf of SEQ Catchments and South East Queensland Local Governments, Brisbane.

Department of the Environment (2015a). Draft Outcome-based conditions guidance – Environment Protection and Biodiversity Conservation Act 1999. Commonwealth of Australia, Canberra.

Department of the Environment (2015b). Outcome-based Conditions Policy – Environment Protection and Biodiversity Conservation Act 1999. Commonwealth of Australia, Canberra.

Department of Sustainability, Environment, Water, Population and Communities (2012). Environment Protection and Biodiversity Conservation Act 1999 Environmental Offsets Policy. Australian Government, Canberra.

Queensland Herbarium (2015). Biocondition: A condition assessment framework for terrestrial biodiversity in Queensland – Assessment Manual. Department of Science, Information Technology, Innovation and the Arts, Brisbane.

Ecos 9 Consulting (2011). Flora Assessment – Lower Mooloolah River Environmental Reserve – Claymore Road, Sippy Downs. Report to Sunshine Coast Council.

RPS (2016). Threatened Ecological Community Impact Assessment (Lowland Rainforest of Subtropical Australia). Report to Department of Transport and Main Roads, Maroochydore.

Stringybark Consulting (2012). Vegetation Management Plan (Revegetation and Rehabilitation): Lower Mooloolah River Environmental Reserve. Report to Sunshine Coast Council.

Sunshine Coast Council (2012). Sunshine Coast Local Government Area Pest Management Strategy 2012-2016. Sunshine Coast Council.

Threatened Species Scientific Committee (TSSC) (2011). Advice to the Minister for Sustainability, Environment, Water, Population and Communities from the Threatened Species Scientific Committee on an Amendment to the List of Threatened Ecological Communities under the Environment Protection and Biodiversity Conservation Act 1999. (<http://www.environment.gov.au/biodiversity/threatened/communities/pubs/101-listing-advice.pdf>).

# **Attachment 1 Listing advice for Lowland Rainforest of Subtropical Australia Threatened Ecological Community**

**Advice to the Minister for Sustainability, Environment, Water, Population and Communities from the Threatened Species Scientific Committee (the Committee) on an Amendment to the List of Threatened Ecological Communities under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)**

**1 Name of the ecological community**

**Lowland Rainforest of Subtropical Australia**

The ecological community was nominated as Lowland Subtropical Rainforest on Basalt and Alluvium in North East NSW and South East Queensland. The Committee has determined the name of the ecological community to be **Lowland Rainforest of Subtropical Australia**. In the new name ‘Subtropical’ has been used to describe the climatic zone where the ecological community generally occurs within eastern Australia, rather than the specific type of rainforest that comprises the ecological community.

Throughout this document the Lowland Rainforest of Subtropical Australia is often abbreviated to the ‘Lowland Rainforest’ or ‘the ecological community’.

Much of the **Lowland Rainforest of Subtropical Australia** ecological community is listed as endangered in New South Wales as ‘Lowland Rainforest in the NSW North Coast and Sydney Basin Bioregions’ and ‘Lowland Rainforest on floodplain in the NSW North Coast Bioregion’ (DECC, 1999, 2006); and as ‘of concern’ or ‘endangered’ under a number of Regional Ecosystems in Queensland (for more detail, see Section 6. National Context – *Relationships to State-listed ecological communities and state vegetation classifications*, below).

**2. Public Consultation**

A technical workshop with experts on the ecological community was held in June 2010. The nomination and a technical report, based on the workshop outcomes, were made available for public exhibition and comment for a minimum 30 business days. The Committee has had regard to all public and expert comment that was relevant to the consideration of the ecological community.

**3. Summary of conservation assessment by the Committee**

The Committee provides the following assessment of the appropriateness of the ecological community’s inclusion in the EPBC Act list of threatened ecological communities.

The Committee judges that the ecological community has been demonstrated to have met sufficient elements of:

Criterion 1 to make it **eligible** for listing as **endangered**,

Criterion 2 to make it **eligible** for listing as **critically endangered**,

Criterion 3 to make it **eligible** for listing as **endangered**; and

Criterion 4 to make it **eligible** for listing as **endangered**.

The highest category for which the ecological community is **eligible** to be listed is **critically endangered**.

## 4. Description

### *Location*

The ecological community primarily occurs from Maryborough in Queensland to the Clarence River (near Grafton) in New South Wales (NSW). The ecological community also includes isolated areas between the Clarence River and Hunter River such as the Bellinger and Hastings valleys. The ecological community occurs in the following Interim Biogeographic Regionalisation for Australia Version 6.1 (IBRA) Bioregions: South Eastern Queensland Bioregion and NSW North Coast Bioregion.

### *Physical environment*

The ecological community occurs on basalt and alluvial soils, including sand and old or elevated alluvial soils as well as floodplain alluvia. It also occurs occasionally on enriched rhyolitic soils and basaltically enriched metasediments. Lowland Rainforest mostly occurs in areas <300 m above sea level. Aspect can result in the ecological community being found at >300 m altitude on north-facing slopes, but typically 300 m defines the extent of the lowlands. In addition, Lowland Rainforest typically occurs in areas with high annual rainfall (>1300 mm).

The physical environment where the ecological community occurs is differentiated from the EPBC listed Littoral Rainforest and Coastal Vine Thickets of Eastern Australia ecological community (hereafter referred to as Littoral Rainforest) by the level of coastal or estuarine influence (such as windshear). Lowland Rainforest typically occurs more than 2 km from the coast, however, it can (and does) intergrade with Littoral Rainforest in some coastal areas.

### *Vegetation structure*

The ecological community is generally a moderately tall ( $\geq 20$  m) to tall ( $\geq 30$  m) closed forest (canopy cover  $\geq 70\%$ ). Tree species with compound leaves are common and leaves are relatively large (notophyll to mesophyll). Typically there is a relatively low abundance of species from the genera *Eucalyptus*, *Melaleuca* and *Casuarina*. Buttresses are common as is an abundance and diversity of vines.

Lowland Rainforest has the most diverse tree flora of any vegetation type in NSW (Floyd, 1990a) and the species composition of the canopy varies between local stands and between regions (Keith, 2004). The ecological community typically has high species richness ( $\geq 30$  woody species from [Appendix A](#)). The canopy comprises a range of tree species but in some areas a particular species may dominate e.g. palm forest, usually dominated by *Archontophoenix cunninghamiana* (bangalow palm) or *Livistona australis* (cabbage palm); and riparian areas dominated by *Syzygium floribundum* (syn. *Waterhousea floribunda*) (weeping satinash/weeping lilly pilly).

The canopy is often multilayered consisting of an upper, discontinuous layer of emergents, over the main canopy and subcanopy. Below the canopy is an understorey of sparse shrubs and seedlings.

The upper, discontinuous layer includes **canopy emergents** that may be 40–50 m tall and have large spreading crowns. This layer is composed of species such as *Araucaria cunninghamii* (hoop pine), *Ficus* spp. (figs), *Lophostemon confertus* (brushbox), and in some sites, *Eucalyptus* spp.. Typically non-rainforest species such as eucalypts and brushbox comprise <30% of canopy emergents.

The **canopy/subcanopy layer** contains a diverse range of species. Representative species include: hoop pine, figs, *Argyrodendron trifoliolatum*/*Heritiera trifoliolata* (white booyong), *Castanospermum australe* (black bean), *Cryptocarya obovata* (white walnut, pepperberry),

*Dendrocnide excelsa* (giant stinging tree), *Diploglottis australis* (native tamarind), *Dysoxylum fraserianum* (rosewood), *Dysoxylum mollissimum* (red bean), *Elatostachys nervosa* (green tamarind), *Endiandra pubens* (hairy walnut), *Flindersia schottiana* (bumpy ash, cudgerie, silver ash), *Gmelina leichhardtii* (white beech), *Neolitsea australiensis* (bolly gum), *Neolitsea dealbata* (white bolly gum), *Sloanea australis* (maiden's blush), *Sloanea woollsii* (yellow carabeen), *Toona ciliata* (red cedar), and epiphytes such as *Platyserium* spp. and *Asplenium australasicum* (bird's nest fern).

In areas where the canopy is lower (<25 m) due to coastal or estuarine influences the Littoral Rainforest ecological community typically replaces the Lowland Rainforest ecological community.

The **understorey** contains a sparse layer of species such as *Cordyline stricta* (narrow-leaved palm lily), *Linospadix monostachya* (walking stick palm), *Neolitsea dealbata* (white bolly gum), *Notelaea johnsonii* (veinless mock olive), *Pittosporum multiflorum* (orange thorn), *Triunia youngiana* (native honey-suckle bush), *Wilkiea austroqueenslandica* (smooth wilkiea) and *Wilkiea huegeliana* (veiny wilkiea) as well as seedlings of a variety of canopy species. A variety of vines may be present such as *Calamus muelleri* (lawyer vine), *Cissus antarctica* (native grape vine, water vine), *Cissus hypoglauca* (giant water vine), *Dioscorea transversa* (native yam), *Flagellaria indica* (whip vine), *Morinda jasminoides* (sweet morinda), *Pandorea floribunda* (wonga wonga vine) and *Smilax australis* (sarsaparilla). Ferns such as *Adiantum hispidulum* (rough maidenhair fern), *Doodia aspera* (rasp fern), *Lastreopsis decomposita* (trim shield fern) and *Lastreopsis marginans* (bordered shield fern, glossy shield fern) may also be present.

### **Fauna**

The diversity of rainforest plants and the high nutritional content of their fruits and leaves provide the foundation for the high diversity of animals in the ecological community. This is a direct reflection of the high nutrient soils and moist environment occupied by this rainforest type. Remnants and regenerating patches of Lowland Rainforest provide important habitat and food resources for a range of fauna. In turn the Lowland Rainforest flora also relies on the native fauna for pollination and seed dispersal.

Lowland Rainforest is characterised by a high proportion of frugivorous birds, epiphyte and litter foraging vertebrates, micro- and mega-chiropteran bats, and a broad range of invertebrate groups associated with the decomposition cycle (such as insects and snails).

Vertebrate species that commonly occur in Lowland Rainforest are listed in Table 1.

Table 1. Vertebrate species that commonly occur in Lowland Rainforest of Subtropical Australia ecological community.

|                                   |                              |
|-----------------------------------|------------------------------|
| <b>Frogs</b>                      |                              |
| <i>Lechriodus fletcheri</i> *     | Fletcher's frog              |
| <i>Litoria chloris</i>            | red-eyed tree frog           |
| <i>Mixophyes iteratus</i> *       | giant barred frog            |
| <b>Reptiles</b>                   |                              |
| <i>Bellatorias major</i>          | land mullet                  |
| <i>Cacophis krefftii</i>          | dwarf crowned snake          |
| <i>Hypsilurus spinipes</i>        | southern forest dragon       |
| <i>Ophioscincus truncatus</i>     | yellow-bellied legless-skink |
| <i>Saltuarius swaini</i>          | southern leaf-tailed gecko   |
| <i>Saproscincus challengeri</i> * | orange-tailed shadeskink     |
| <b>Birds</b>                      |                              |
| <i>Carterornis leucotis</i>       | white-eared monarch          |
| <i>Colluricincla megarrhyncha</i> | little shrike-thrush         |
| <i>Coracina lineata</i> *         | barred cuckoo-shrike         |
| <i>Orthonyx temminckii</i>        | Australian logrunner         |
| <i>Pitta versicolor</i>           | noisy pitta                  |
| <i>Podargus ocellatus</i> *       | marbled frogmouth            |
| <i>Ptilinopus magnificus</i> *    | wompoo fruit-dove            |
| <i>Ptilinopus regina</i> *        | rose-crowned fruit-dove      |
| <i>Sericulus chrysocephalus</i>   | regent bowerbird             |
| <i>Sphecotheres vieilloti</i>     | Australasian figbird         |
| <i>Symposiachrus trivirgatus</i>  | spectacled monarch           |
| <i>Tregellasia capito</i>         | pale-yellow robin            |
| <i>Turnix melanogaster</i> *      | black-breasted button-quail  |
| <b>Mammals</b>                    |                              |
| <i>Antechinus subtropicus</i>     | subtropical antechinus       |
| <i>Melomys cervinipes</i>         | fawn-footed melomys          |
| <i>Nyctimene robinsoni</i> *      | eastern tube-nosed bat       |
| <i>Nyctophilus bifax</i> *        | eastern long-eared bat       |
| <i>Pteropus alecto</i>            | black flying-fox             |
| <i>Thylogale stigmatica</i> *     | red-legged pademelon         |

Lowland Rainforest has an influx of birds in the cooler months (mainly April to September) from higher altitudes (Holmes, 1987; Osborne, 1991). These species include the regent bowerbird, *Acanthorhynchus tenuirostris* (eastern spinebill), *Columba leucomela* (white-

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\* Threatened species (see: Appendix D)

headed pigeon), *Dicrurus bracteatus* (spangled drongo), *Gerygone mouki* (brown gerygone), *Lopholaimus antarcticus* (topknot pigeon), *Petroica rosea* (rose robin), *Pachycephala pectoralis* (golden whistler), *Ptilonorhynchus violaceus* (satin bowerbird), *Rhipidura albiscapa* (grey fantail), and *Zoothera lunulata* (Bassian thrush). Frugivorous species present throughout the year include the Australasian figbird, wompoo fruit-dove, *Ailuroedus crassirostris* (green catbird), *Alisterus scapularis* (Australian king-parrot), *Lalage leucomela* (varied triller), *Macropygia amboinensis* (brown cuckoo-dove), *Meliphaga lewinii* (Lewin's honeyeater) and *Strepera graculina* (pied currawong) (Holmes, 1987).

The relationships between the Lowland Rainforest ecological community and associated fauna is emphasised by the distributional limits of some vertebrate species aligning with the distributional limit of the ecological community. The rose-crowned fruit-dove (Vulnerable in NSW), although widely distributed in subtropical rainforest, reaches its southern breeding limit in the lower Clarence Valley and does not occur regularly south of the Hunter River (NSW Scientific Committee, 2008). The southern limit of the marbled frogmouth, white-eared monarch and eastern tube-nosed bat also align with the southern limit of the ecological community (Milledge pers. comm. 2010).

The northern limits of distribution of some other rainforest vertebrates align with the northern limit of the ecological community. These include the green catbird, southern forest dragon, *Hoplocephalus stephensii* (Stephen's banded snake), *Ptiloris paradiseus* (paradise riflebird), *Saproscincus rosei* (Rose's shadescink) and *Thylogale thetis* (red-necked pademelon) (Milledge pers. comm. 2010).

Several other rainforest vertebrates are also endemic to the latitudinal extent of the ecological community but also extend to higher elevations. These include the subtropical antechinus, *Menura alberti* (Albert's lyrebird) and *Philoria loveridgei* (Loveridge's frog) (Milledge pers. comm. 2010).

## **5. Key Diagnostic Characteristics and Condition Thresholds**

It is recognised that many examples of the ecological community now occur in a degraded or disturbed state. In some cases, the degradation is irreversible, or the potential for rehabilitation is limited or impractical. For example, areas previously dominated by Lowland Rainforest that are now permanently converted to cropland or development are unlikely to be rehabilitated back to a condition that reaches the 'Description' requirements.

National listing focuses legal protection on patches of the ecological community that are most functional, relatively natural (as defined by the 'Description') and in relatively good condition. Condition thresholds help identify both the ecological community and ecological function using a set of criteria that assist in indicating when the EPBC Act is likely to apply to an ecological community. They provide guidance for when a patch of a threatened ecological community retains sufficient conservation values to be considered as a Matter of National Environmental Significance\*, as defined under the EPBC Act. This means that the referral, assessment and compliance provisions of the EPBC Act are focussed on the most valuable elements of Australia's natural environment, while heavily degraded or modified patches will be largely excluded.

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\* For more information on Matters of National Environmental Significance see: [www.environment.gov.au/epbc/protect/index.html](http://www.environment.gov.au/epbc/protect/index.html)

Although very degraded or modified patches are not protected as the ecological community listed under the EPBC Act, it is recognised that patches that do not meet the condition thresholds may still retain important natural values and may have the potential to be rehabilitated to a point where they meet the condition thresholds. Therefore, these patches should not be excluded from recovery and other management actions.

Condition thresholds are determined in consultation with experts on the particular ecological community. They include a range of criteria such as: diversity of native species present; vegetation structure and cover attributes; level of weed invasion; patch size; and proximity to other native vegetation remnants.

***The key diagnostic characteristics of the listed ecological community are:***

- Distribution of the ecological community is primarily in the NSW North Coast and South Eastern Queensland bioregions, according to Interim Biogeographic Regionalisation for Australia (IBRA) version 6.1 (2004).
- The ecological community occurs on: soils derived from basalt or alluvium; or enriched rhyolitic soils; or basaltically enriched metasediments.
- The ecological community generally occurs at an altitude less than 300 m above sea level.
- The ecological community typically occurs in areas with high annual rainfall (>1300mm).
- The ecological community is typically more than 2 km inland from the coast.
- The structure of the ecological community is typically a tall (20 m–30 m) closed forest, often with multiple canopy layers.
- Patches of the ecological community typically have high species richness (at least 30 woody species from Appendix A).

### Condition thresholds:

The listed **Lowland Rainforest of Subtropical Australia** ecological community comprises those patches that meet the key diagnostic characteristics (above) and the **condition thresholds** (below).

| Patch Type                                                                                                                                                                                                                                                                               | A                                                                                            | B                                                                                                                                                                                               | C                                                                                                                                                                                                                            |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (evidence of remnant vegetation & regeneration status)                                                                                                                                                                                                                                   | Natural remnant evident by the persistence of mature residual trees from <u>Appendix B</u> . | Some residual trees from <u>Appendix B</u> are present plus evidence of either;<br>natural regeneration <sup>*1</sup><br><br><b>AND/OR</b><br>regeneration with active management <sup>*2</sup> | A non-remnant patch that has recovered through<br>a) natural regeneration <sup>*1</sup><br><br><b>AND/OR</b><br>b) supplementary planting that has stature and quality that is reflective of the ‘Description’ <sup>*3</sup> |
|                                                                                                                                                                                                                                                                                          | <b>AND</b>                                                                                   | <b>AND</b>                                                                                                                                                                                      | <b>AND</b>                                                                                                                                                                                                                   |
| Patch Size                                                                                                                                                                                                                                                                               | ≥ 0.1 ha                                                                                     | ≥ 1 ha                                                                                                                                                                                          | ≥ 2 ha                                                                                                                                                                                                                       |
| (excludes buffer zone)                                                                                                                                                                                                                                                                   | <b>AND</b>                                                                                   | <b>AND</b>                                                                                                                                                                                      | <b>AND</b>                                                                                                                                                                                                                   |
| Canopy Cover                                                                                                                                                                                                                                                                             | Emergent/canopy/subcanopy <sup>*4</sup> cover is ≥ 70%                                       |                                                                                                                                                                                                 |                                                                                                                                                                                                                              |
| (over entire patch) <sup>*4</sup>                                                                                                                                                                                                                                                        | <b>AND</b>                                                                                   |                                                                                                                                                                                                 |                                                                                                                                                                                                                              |
| Species Richness                                                                                                                                                                                                                                                                         | contains ≥ 40 native woody species <sup>*5</sup> from Appendix A                             | contains ≥ 30 native woody species <sup>*5</sup> from Appendix A                                                                                                                                |                                                                                                                                                                                                                              |
| (over entire patch)                                                                                                                                                                                                                                                                      | <b>AND</b>                                                                                   | <b>AND</b>                                                                                                                                                                                      |                                                                                                                                                                                                                              |
| Percent of total vegetation cover that is native <sup>*6</sup>                                                                                                                                                                                                                           | ≥70% of vegetation <sup>*6</sup> is native                                                   | ≥50% of vegetation <sup>*6</sup> is native                                                                                                                                                      |                                                                                                                                                                                                                              |
| (use sample plot)                                                                                                                                                                                                                                                                        |                                                                                              |                                                                                                                                                                                                 |                                                                                                                                                                                                                              |
| <b>Notes:</b>                                                                                                                                                                                                                                                                            |                                                                                              |                                                                                                                                                                                                 |                                                                                                                                                                                                                              |
| <sup>*1</sup> Evidence of natural regeneration is shown by the presence of seedlings of a range of native species that did not originate through deliberate plantings.                                                                                                                   |                                                                                              |                                                                                                                                                                                                 |                                                                                                                                                                                                                              |
| <sup>*2</sup> A patch that is <b>actively managed</b> has regular (e.g. every 1–2 years) on the ground human regenerative activity such as weed control or supplementary plantings.                                                                                                      |                                                                                              |                                                                                                                                                                                                 |                                                                                                                                                                                                                              |
| <sup>*3</sup> Closed canopy, 20–30 m tall, of representative species (e.g. white booyong, hoop pine, figs, brush box, yellow carabeen, red cedar, rosewood, white beech)                                                                                                                 |                                                                                              |                                                                                                                                                                                                 |                                                                                                                                                                                                                              |
| <sup>*4</sup> Canopy cover (projective foliage cover) is estimated over the entire patch. When assessing the ecological community, the canopy includes the emergents and subcanopy (everything above 10 m tall). Canopy/sub-canopy includes all trees and vines (native and non-native). |                                                                                              |                                                                                                                                                                                                 |                                                                                                                                                                                                                              |
| <sup>*5</sup> Woody species are trees, shrubs or vines that contain wood or wood fibres that consist mainly of hard lignified tissues. Excluded from woody species are graminoids, other herbs and non-woody vines.                                                                      |                                                                                              |                                                                                                                                                                                                 |                                                                                                                                                                                                                              |
| <sup>*6</sup> Total vegetation cover includes emergents/canopy/subcanopy and understorey and ground layers.                                                                                                                                                                              |                                                                                              |                                                                                                                                                                                                 |                                                                                                                                                                                                                              |

A **patch** is defined as a discrete and continuous area of the ecological community. However, a patch may include small-scale disturbances, such as tracks or breaks, watercourses or small-scale variations in vegetation that do not significantly alter its overall functionality (functionality here refers to processes such as the movement of wildlife and pollinators, the dispersal of plant propagules, activities of seed and plant predators and many others).

Patches of Lowland Rainforest that remain today and meet the condition thresholds (above) are typically in varying states of condition as a result of landuse history in the area. A **natural remnant** is a patch of native vegetation that remains after the surrounding area has been cleared or modified (patch type **A**). It contains **persistent residual**/mature trees of which many, but not all, pre-date clearing. A natural remnant is a largely undisturbed patch of native vegetation that has a high species richness with relatively little weed infestation. The second patch type (**B**) recognised in the condition thresholds has some residual/mature trees (not necessarily original/pre-clearing) and there is evidence **of natural regeneration and/or active management**. The third patch type (**C**) reflects the ability of this ecological community to regenerate in some circumstances, either naturally or through human intervention. There may not be any mature/large trees but it must be 2 ha or more in size and regeneration is evident. **Regeneration (natural or through supplementary planting)** must be of stature and quality that reflects the 'Description' of the ecological community (i.e. tall, closed forest with representative species composition and species diversity, as well as a relatively low weed component in all layers). It is likely that a patch may be comprised of a combination of these patch types such as a small natural remnant surrounded by regeneration.

The **sampling protocol** involves developing a quick/simple map of the vegetation condition, diversity, landscape qualities and management history (where possible) of the site. For sites  $\leq 2$  ha evaluate the entire site for canopy cover and species richness. For sites  $>2$  ha use **sample plots** of 50 × 20 m to obtain a representative sample of the site including any different patch types. An appropriate sampling strategy should be used that captures the diversity of the site and recognises any variation e.g. due to topography.

The Lowland Rainforest ecological community has a relatively high potential for rehabilitation and natural **regeneration**. Rainforests are dynamic communities that can regenerate naturally following disturbance and structural damage. Some rainforest species store viable seed in the soil (although viability varies between species) but more commonly rainforest species rely on rapid germination and seedlings in the understorey<sup>1</sup> (Big Scrub Rainforest Landcare Group, 2005). As canopy gaps appear, the availability of light removes any suppression to seedling growth. The inclusion of patches of natural and managed regeneration (with  $\geq 30$  species from [Appendix A](#)) as part of the ecological community is due to the particular ability of this ecological community to regenerate. Degraded patches that are actively managed (i.e. weeds removed and/or supplementary planting) are capable of re-establishing an area and supporting a basic ecologically functional state.

In addition to the patch a minimum **buffer zone** that extends 50 m beyond the trunks of the outermost trees in the patch is defined to assist in the preservation of the patch. Fifty metres is the maximum likely height of a tree in the ecological community. The 50 m buffer zone will encompass an area large enough to protect the root zone of edge trees. The buffer zone will also help protect the ecological community from spraydrift (fertiliser, pesticide or herbicide sprayed in adjacent land) and other threats.

The purpose of the buffer zone is to protect and manage the patch and to help avoid potential significant impacts\* to the ecological community. Its purpose is not specifically to extend the patch through regeneration, although this would be beneficial.

If the use of an area (e.g. grazing land) that adjoins a patch of the ecological community is going to be intensified (e.g. intensified grazing or changed to cropping) then approval under

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<sup>1</sup> It is not uncommon for seedlings within this ecological community to be suppressed in the understorey.

\* For more information on Matters of National Environmental Significance see:  
[www.environment.gov.au/epbc/protect/index.html](http://www.environment.gov.au/epbc/protect/index.html)

the EPBC Act may be required. Changes in land-use to the land that falls within the buffer zone must not have a significant impact on the ecological community, but there are exemptions for continuing use\*.

### ***Surrounding environmental and landscape context***

The condition thresholds outlined above are the minimum level at which patches are to be considered under the EPBC Act for actions that may require referral to the Australian Government. These thresholds do not represent the ideal state of the ecological community. Patches that are larger, more species rich and less disturbed are likely to provide greater biodiversity value. Additionally, patches that are spatially linked, whether ecologically or by proximity, are particularly important as wildlife habitat and to the viability of those patches of the ecological community into the future.

Therefore, in the context of actions that may have ‘significant impacts’ and require approval under the EPBC Act, it is important to consider the environment surrounding patches that meet the condition thresholds. Some patches that meet the condition thresholds occur in isolation and require protection, as well as priority actions, to link them with other patches. Other patches that are interconnected to similar native vegetation associations that may not, in their current state, meet the condition thresholds have additional conservation value. In these instances, the following indicators should be considered when assessing the impacts of actions or proposed actions under the EPBC Act, or when considering recovery, management and funding priorities for a particular patch:

- Large size and/or a large area to boundary ratio – larger area/boundary ratios are less exposed and more resilient to edge effect disturbances such as weed invasion and other human impacts;
- Evidence of recruitment of key native plant species or the presence of a range of age cohorts (including through successful assisted regeneration);
- Good faunal habitat as indicated by patches containing mature (persistent residual) trees, logs, watercourses, diversity of landscape, contribution to movement corridors;
- High species richness, as shown by the variety of native species;
- Presence of listed threatened species;
- Areas of minimal weeds and feral animals, or where these can be managed;
- Connectivity to other native vegetation remnants or restoration works. In particular, a patch in an important position between (or linking) other patches in the landscape; and/or,
- Patches that occur in areas where the ecological community has been most heavily cleared and degraded, or that are at the natural edge of its range.

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\* For more information on Matters of National Environmental Significance see:  
[www.environment.gov.au/epbc/protect/index.html](http://www.environment.gov.au/epbc/protect/index.html)

## 6. National Context

The area where Lowland Rainforest occurs has significant biodiversity values. It is located in the McPherson Macleay Overlap, contains the Big Scrub rainforest, supports World Heritage Rainforest and includes the Border Ranges which is one of Australia's National Biodiversity Hotspots.

The core of the Lowland Rainforest ecological community is in the Big Scrub region near Lismore. This lowland area has been heavily cleared due to its highly fertile basalt soils. The ecological community also extends to the north and the south and includes lowland areas mainly on fertile basalt soils but also some areas on enriched sand, rhyolite and basalt enriched metasediments. Floristically, the ecological community also centres around the core area of the Big Scrub. Rainforests of this region are characterised by the following species; white booyong, black bean, native tamarind, white bolly gum, pepperberry, figs, red cedar and bangalow palm. However, the outlying patches of the ecological community (in areas such as the Bellinger and Hunter valleys) intergrade with drier rainforests and include the following species: hoop pine; whalebone tree; silky oak; and, small-leaved tuckeroo. The ecological community is generally not described as dry rainforest but may include intergrades with dry rainforest and other rainforest types that meet the key diagnostic characteristics and condition thresholds.

### **Distribution**

The ecological community primarily occurs from Maryborough in Queensland to the Clarence River (near Grafton) in NSW. The ecological community also includes isolated areas between the Clarence River and Hunter River such as the Bellinger and Hastings valleys. The ecological community occurs in the following IBRA Bioregions (V. 6.1): SE Qld Bioregion and NSW North Coast Bioregion.

The ecological community is known to occur in the following Natural Resource Management (NRM) and Catchment Management Authority (CMA) regions: SE Queensland Catchments, Burnett Mary Regional Group, Northern Rivers and Hunter-Central Rivers.

The latitudinal distribution of the ecological community is confined by recognised dry corridors in both the north and the south. A low rainfall corridor associated with the absence of subcoastal highlands, which in the humid areas ensure orographic rainfall eastwards, occurs north of Gladstone to Rockhampton (Webb and Tracey, 1981; Adam, 1992). The Hunter Valley also acts as a dry corridor south to the Hawkesbury sandstone around Sydney. These corridors separate the Lowland Rainforest ecological community from more tropical rainforest in the north and the transitional rainforests in the south.

The ecological community does not include the rainforest on Queensland's sand islands such as Fraser Island as the rainforests on these islands have a closer affinity to Littoral Rainforest. However, it does occur on alluvial sands accumulated from terrestrial sources elsewhere.

The ecological community does not include rainforest found further south, such as in the Illawarra region. Rainforests in the Illawarra region generally occur at higher altitudes (Mills, 1987) and are characterised by different species. With increasing altitude rainforest also become less diverse and structurally simpler (Adam, 1992). The Illawarra is beyond the southern limits of Floyd's (1990a) *Argyrodendron trifoliolatum* alliance which is typical in the Lowland Rainforest ecological community. The Illawarra region is the northern limit to many southern cool temperate rainforest species. Many of the species common in the Lowland Rainforest ecological community are not found in the Illawarra as they do not survive the lower temperatures (Mills, 1987).

The Macpherson Macleay Overlap spans the Queensland NSW border, from the Macpherson Ranges in the north to the Macleay River in the south (Webb and Tracey, 1981). Much of the rainforest in the Overlap is part of the Mount Warning shield which extends between Beenleigh on the northern edge of the shield and the Richmond River on the southern edge. The Overlap region has a high diversity and a large area of Lowland Rainforest, including the Big Scrub (Webb and Tracey, 1981). The rainforests of the Mount Warning shield are particularly important for conservation of both rare plants and species of ecological significance. Twenty-three rainforest plant species are endemic to the Border lowlands and adjacent low ranges and approximately 200 rainforest species are either at their northern or southern limits on the Mount Warning shield (Lott and Duggin, 1993).

### **Similar ecological communities**

**Littoral Rainforest** and Lowland Rainforest have some overlap in species composition. Littoral Rainforest typically has lower stature than Lowland Rainforest due to maritime influences including windshear. Species diversity and the abundance of vines, buttresses, ground ferns and epiphytes are lower in Littoral Rainforest. In some circumstances there are also more sclerophyllous species such as *Eucalyptus*, *Corymbia* and *Banksia* as well as salt tolerant species.

The major canopy species in Littoral Rainforest are: *Podocarpus elatus* (plum pine, brown pine), *Ficus obliqua* (small-leaved fig), *F. macrophylla* (Moreton Bay fig), *Drypetes deplanchei* (yellow tulip, grey boxwood), *Cryptocarya triplinervis* var. *tripplinervis* (brown laurel, three-veined cryptocarya), *Cupaniopsis anacardioides* (tuckeroo), *Acmena hemilampra* (*Syzygium hemilamprum* – broad-leaved lilly pilly, blunt satinash), *Acmena smithii* (*Syzygium smithii* – lilly pilly, lillipilly satinash), *Lophostemon confertus* (brushbox) and *Syzygium luehmannii* (riberry, cherry satinash) (Floyd, 1990a). These areas will usually also have salt tolerant species such as *Acronychia imperforata* (logan apple), *Alectryon coriaceus* (beach alectryon), *Cupaniopsis anacardioides* (coastal tuckeroo) and *Macaranga tanarius* (macaranga) present. The Listing Advice for Littoral Rainforest and Vine Thickets of Eastern Australia contains a more complete list of flora and fauna (TSSC, 2008).

**Wet sclerophyll forests** that occur adjacent to Lowland Rainforest are characterised by a tall, open, sclerophyllous tree canopy of *Eucalyptus grandis* (flooded gum), *E. microcorys* (tallowwood) and *E. pilularis* (blackbutt) and an understorey of soft-leaved, shrubs, ferns and herbs. Many understorey plants are rainforest species or have close rainforest relatives. This type of forest is often found at the margin of the Lowland Rainforest, usually on the more exposed and drier areas. Emergents such as *Eucalyptus saligna* (Sydney blue gum), *Lophostemon confertus* (brush box), *Syncarpia glomulifera* (turpentine) and *E. acmenoides* (white mahogany) occur more frequently than in Lowland Rainforest. Wet sclerophyll forest may have an understorey of rainforest species but the emergent, non-rainforest species of >30% (DECC, 2007) is greater than that found in Lowland Rainforest.

Wet sclerophyll forest relies on fire for regeneration of some species. The understorey of wet sclerophyll forest typically consists of palms in the poorly drained valley floors or small trees and shrubs such as *Elaeocarpus reticulatus* (blueberry ash), *Brachychiton acerifolius* (flame tree) and *Backhousia myrtifolia* (grey myrtle) in the better drained areas (DECCW, 2005).

**Dry rainforests** that occur adjacent to Lowland Rainforest tend to have no palms and fewer fern and herbs species than Lowland Rainforest, but more shrubs and vines in the understorey (Keith, 2004). Dry rainforests occur where the soil moisture and nutrients are less than areas that support Lowland Rainforest. Typically these rainforests occur in rough terrain and rocky substrates (Keith, 2004) and at higher altitudes than Lowland Rainforest. Dry rainforest is characterised by canopy species such as *Alectryon subcinereus* (wild quince), *Backhousia sciadophora* (shatterwood) and *Brachychiton discolor* (lacebark tree) (Keith, 2004).

#### ***Relationships to State-listed ecological communities and state vegetation classifications***

All or part of the following equivalent state vegetation classifications and ecological communities are representative of the national Lowland Rainforest ecological community where the requirements of the Description, Key diagnostic characteristics and Condition thresholds are met. Lowland Rainforest is not limited to these state equivalents.

#### ***Qld Regional Ecosystems:***

- 12.3.1 Complex to simple notophyll vine forest- Gallery rainforest (notophyll vine forest) on alluvial plains (endangered)
- 12.5.13 Microphyll to notophyll vine forest +/- *Araucaria cunninghamii* (endangered)
- 12.8.3 Complex notophyll vine forest – complex notophyll vine forest on Cainozoic igneous rocks (no concern)
- 12.8.4 Complex notophyll vine forest with *Araucaria* spp. on Cainozoic igneous rocks (no concern)
- 12.8.13 Araucarian complex microphyll vine forest on Cainozoic igneous rocks (of concern)
- 12.11.1 Simple notophyll vine forest often with abundant *Archontophoenix cunninghamiana* (“gully vine forest”) on metamorphics +/- interbedded volcanics (no concern)
- 12.11.10 Notophyll vine forest +/- *Araucaria cunninghamii* on metamorphics +/- interbedded volcanics (no concern)
- 12.12.1 Simple notophyll vine forest usually with abundant *Archontophoenix cunninghamiana* (“gully vine forest”) on Mesozoic to Proterozoic igneous rocks (of concern)
- 12.12.16 Notophyll vine forest on Mesozoic to Proterozoic igneous rocks (no concern)

#### ***New South Wales***

Ecological Communities listed under the NSW *Threatened Species Conservation Act 1995*:

- Lowland Rainforest in the NSW North Coast and Sydney Basin Bioregions (Endangered)
- Lowland Rainforest on floodplain in the NSW North Coast Bioregion (Endangered)

### ***Relationships to other vegetation classifications***

The ecological community corresponds, entirely or in part, to the following vegetation classifications:

*National Vegetation Information System (NVIS) (v. 3.1):*

- Major Vegetation Group (MVG) 1: Rainforest and vine thickets
- Major Vegetation Subgroup (MVS) 2: Tropical or subtropical rainforest

*Webb (1968):*

- Rainforest of Provinces A1 and A2 – Southern Queensland and New South Wales
- Rainforest of Provinces C1 – coastal lowlands and adjacent ranges of southern Queensland for just north of Brisbane to Mackay (with extensions north and south)

*Keith (2004):*

- Subtropical Rainforests
- Northern Warm Temperate Rainforests

*Floyd (1990b):*

- *Argyrodendron trifoliolatum* Alliance  
Suballiance 1: *Argyrodendron trifoliolatum*  
Suballiance 2: *Toona* – *Flindersia*  
Suballiance 3: *Cryptocarya obovata* – *Dendrocnide excelsa* – *Ficus* spp – *Araucaria*.  
Suballiance 4: *Elaeocarpus grandis*,  
Suballiance 5: *Castanospermum australe* – *Dysoxylum muelleri*  
Suballiance 6: *Archontophoenix* – *Livistona*
- *Dendrocnide excelsa* – *Ficus* spp. Alliance  
Suballiance 15: *Ficus* spp. – *Dysoxylum fraserianum* – *Toona* – *Dendrocnide*  
*Drypetes australasica* – *Araucaria cunninghamii* Alliance  
Suballiance 21: *Araucaria cunninghamii*  
Suballiance 22: *Flindersia* spp. – *Araucaria*  
Suballiance 23: *Ficus* – *Streblus* – *Dendrocnide* – *Cassine*,
- *Castanospermum* – *Waterhousea floribunda* Alliance  
Suballiance 24: *Castanospermum* – *Grevillea robusta*  
Suballiance 25: *Streblus* – *Austromyrtus*  
Suballiance 26: *Waterhousea floribunda* – *Tristaniopsis laurina*
- *Ceratopetalum apetalum* Alliance  
Suballiance 33: *Ceratopetalum/Schizomeria Argyrodendron/Sloanea*

## **Heritage**

In 1986 a number of rainforest reserves located on the Great Escarpment of eastern NSW, known as the Australian East Coast Sub-tropical and Temperate Rainforest Parks were inscribed on the World Heritage list for their outstanding natural universal values:

- as an outstanding example representing major stages of the earth's evolutionary history;
- as an outstanding example representing significant ongoing geological processes and biological evolution; and
- containing important and significant habitats for the *in situ* conservation of biological diversity.

Large extensions, including reserves in south-east Queensland, were listed in 1994. In 2007 the World Heritage Committee agreed to the new title of the ***Gondwana Rainforests of Australia*** (DEWHA, 2010a). The listing of Gondwana Rainforests includes 42 separate reserves located between Newcastle and Brisbane with only areas of reserved Crown land included (DEWHA, 2010a).

There is some overlap of the World Heritage listing of Gondwana Rainforests of Australia and the Lowland Rainforest of Subtropical Australia ecological community listing. Areas in reserves such as Main Range National Park, Border Ranges National Park, Lamington National Park and Nightcap National Park are included in the World Heritage listing and also contain significant patches of the ecological community. However, there are also numerous smaller patches of the ecological community which lie outside reserves, and therefore the World Heritage listing. These smaller areas make up a significant number of the remaining patches of the ecological community. They are also valuable stepping-stones and corridors between the larger rainforest reserves, yet they have continued to be susceptible to a number of threats as they have had little or no protection.

## **7. Relevant Biology and Ecology**

The protection of ecological communities or species alone will not be effective unless the ecological processes that sustain them are maintained (Bennett et al., 2009). Many types of ecological processes sustain biodiversity. These include climate processes, primary productivity, hydrological processes, formation of biophysical habitats, interactions between species, movement of organisms and natural disturbance regimes (Bennett et al., 2009).

Movement of organisms within and between ecological communities occur at different spatial and temporal scales depending on size, behaviour and ecology of the species concerned (Bennett et al., 2009). Movements of animals may occur: i) on a daily basis for activities such as foraging, avoiding predators, or for social interactions; ii) to allow individuals to track resources that vary irregularly in space and time; iii) to undertake large-scale seasonal migrations; iv) to access resources at different life-cycle stages, such as moving to or from breeding sites; and v) for newly independent individuals to disperse and establish in a new location. Movements fulfil a variety of roles that contribute to the survival and successful reproduction of individuals and persistence of populations. Movements by organisms also are critical to interspecific interactions such as mutualisms (pollination, seed dispersal), predation, parasitism and competition, which influence the composition of communities (Bennett et al., 2009).

For the Lowland Rainforest ecological community, the movement of some vertebrate fauna is affected by the distance between remnants and consequently the dispersal of some plant

species is affected by the mobility of their animal dispersers. For example, plant species dispersed by native rats are likely to be limited by distances between remnants greater than 0.5 km, whereas plants that rely on flying mammal dispersers such as *Pteropus poliocephalus* (grey-headed flying-fox) that have been shown to disperse seeds of rainforest plants up to 40 km from foraging sites to their daytime camps (Eby, 1989, 1991, 1995) can cope with greater distances between patches of Lowland Rainforest.

Bird species that may have the greatest potential to disperse a large volume and wide variety of plants, including large-seeded plants, tend to be less abundant outside of extensive forests (Moran et al., 2004b). This also suggests that the extent to which dispersal of certain plant species is limited in fragmented Lowland Rainforest (Moran et al., 2004b) is affected by the plant's dispersal mechanism. In some cases these birds are being replaced by smaller bird species that do not disperse the same suite of large seeded plant species (such as species from Lauraceae, Elaeocarpaceae and Sapotaceae families). This means that fewer seedlings of such plant species will be recruited to many rainforest regrowth or remnant patches (Moran et al., 2004a). The smaller bird species that have been observed to be increasing such as the silvereye (Moran et al., 2004b) are also associated with the dispersal of weed species that are common in the fragmented landscape.

The fruits of most rainforest plants are dispersed by animals, particularly birds and bats, but also possums, small mammals, lizards and ants. Somewhat paradoxically, seed predation by insects and rodents, and the browsing of seedlings by herbivores from caterpillars to wallabies, are together thought to play a major role in maintaining the diversity of rainforest plants, by limiting the competitive dominance of species (Big Scrub Rainforest Landcare Group, 2005). On the forest floor worms, mites and a myriad of invertebrates, aided by the raking of lyre-birds, brush turkeys, logrunners and other animals, help to decompose the leaf litter, fallen logs and other refuse of the forest, and promote the recycling of nutrients (Big Scrub Rainforest Landcare Group, 2005). While fleshy fruits sustain a wide range of vertebrate species, the foliage of rainforest trees supports a vast diversity of invertebrate species (Keith, 2004).

Natural regenerative capacity relies not only on seed sources and dispersal but also on pollination. Although some species utilise vertebrate pollinators (e.g. black bean), insects are the dominant pollinators in lowland rainforest (Williams and Adams, 1998). Effective pollination by generalist insect pollinators is most likely to occur within 50 m and unlikely beyond 100 m (Big Scrub Rainforest Landcare Group, 2005). While canopy trees can benefit from a wide range of different pollinators, there is growing awareness that understorey species such as small trees, shrubs, herbs and epiphytes rely on specialist pollinators (Williams and Adams, 1998). Clearing the understorey and increasing fragmentation are therefore more likely to impact acutely on regenerative processes. However, the indirect impacts of loss of pollinators are unlikely to be immediately noticed, and without close monitoring of recruitment may remain masked by current species assemblages. It may take decades to realise the lack of recruitment of key species that support specialist pollinators (Big Scrub Rainforest Landcare Group, 2005). Where individual species are part of a sequential flowering season for local pollinators, their loss may affect the dynamics of the entire remnant patch and possibly further afield (Big Scrub Rainforest Landcare Group, 2005).

The fragmentation of the Lowland Rainforest ecological community, and consequently the habitat for local flora and fauna, has impacted on the ecological processes and the species composition of flora and fauna in the fragmented landscape.

### ***Listed threatened species***

A total of 63 plant species and 42 animal species are listed as threatened under national or state legislation at 31 January 2011. This includes:

- 34 flora species listed under the Commonwealth *EPBC Act 1999*
- 12 fauna species listed under the Commonwealth *EPBC Act 1999*
- 52 flora species listed under the NSW *Threatened Species Conservation Act 1995*
- 34 fauna species listed under the NSW *Threatened Species Conservation Act 1995*
- 37 flora species listed under the Queensland *Nature Conservation Act 1992*
- 24 fauna species listed under the Queensland *Nature Conservation Act 1992*

A list of all threatened species associated with Lowland Rainforest is at [Appendix D](#).

### **8. Description of Threats**

The main ongoing threats to the Lowland Rainforest ecological community are:

- land clearing;
- impacts associated with fragmentation of remnants;
- weeds; and,
- private native forestry.

### ***Land Use History***

Prior to European settlement, virtually the whole of the north coast of NSW was forested. It formed part of a continuum of forest stretching along most of the coast of NSW and southern Queensland. In areas of high rainfall and better soils, the predominant forest type was subtropical rainforest (Big Scrub Rainforest Landcare Group, 2005). Lowland Rainforest of the Big Scrub area near Lismore originally covered 750 square kilometres, and was the most extensive Lowland Rainforest in south-eastern Australia.

In the pre-European landscape, rainforest patches were set within a matrix of more open forest and woodland (dominated by *Eucalyptus* and *Acacia* spp.) from which they differ both structurally and floristically (Webb, 1968; Floyd, 1990a; Neilan et al., 2006). It is likely that the Lowland Rainforest ecological community would have lined the major rivers on the floodplains above the reaches of tidal influence (Keith and Scott, 2005). It would also have spread across elevated flats where moisture and soil nutrients were in abundance, particularly on the Tweed, which receives more rainfall than any of the other major floodplains (Keith and Scott, 2005).

It is thought that the Indigenous people of NSW used Lowland Rainforest seasonally for food and raw materials such as macadamia nuts, figs, wild grapes, yams, cunjevoi roots, the heart of bangalow and cabbage palms, black bean seeds, brush turkeys, bandicoots, pademelons and small wallabies (Keith, 2004; Big Scrub Rainforest Landcare Group, 2005). The fibre from the bark of *Dendrocnide excelsa* (giant stinging tree) was used to make nets for fishing and hunting (Keith, 2004).

Lowland Rainforest provided one of the world's most prized cabinet timbers to early European settlers. *Toona ciliata* (red cedar) was in huge demand as a cabinet timber within Australia and overseas. When the red cedar resource was exhausted, the loggers turned their

attention to *Gmelina leichhardtii* (white beech) and *Araucaria cunninghamii* (hoop pine) (Keith, 2004).

Farming on the newly cleared land took over as the major land use in the 1880s (Keith, 2004). By the twentieth century, most Lowland Rainforest had been cleared for agriculture (Keith, 2004). Today Lowland Rainforest is reduced to scattered remnants, many only a few hectares in size, such as Davis Scrub and Booyong Flora Reserve. Larger stands survive on the Border and Nightcap ranges and in World Heritage areas (Keith, 2004).

In addition to timber, early settlers used Lowland Rainforest for hunting. Pigeons and turkeys were hunted as one of the few sources of fresh meat, and pademelons, possums and water rats were a source of hides (Frith, 1977).

Since much of Lowland Rainforest has been cleared, regrowth dominated by camphor laurel (*Cinnamomum camphora*) has become common on former agricultural land (Frith, 1977; Neilan et al., 2006).

### **Land Clearing**

Land clearing continues to threaten floodplain vegetation, as rural enterprises and hobby farms expand into the upper reaches of the floodplains (Keith and Scott, 2005). The density of isolated trees continues to decline through senescence without replacement and with the conversion of grazing properties to cropping (Keith and Scott, 2005).

Ongoing incremental clearing of vegetation for agricultural activities (in particular macadamias and fruit crops), horticultural industry (and the subsequent introduction of new potential weeds), hobby farming, peri-urban and rural residential development (including vegetation removal for bush fire protection), and private native forestry are further adding to isolation and fragmentation of Lowland Rainforest remnants.

### **Weeds and feral animals**

Weeds compete with native species in the ecological community for space, light, water and nutrients. They also suppress and out-compete mid-storey and canopy trees. Weeds are a major threat to the long-term viability and survival of the majority of Big Scrub remnants and many Lowland Rainforest remnants elsewhere.

Key Threatening Processes (KTPs) listed under the NSW *Threatened Species Conservation Act 1995* and the EPBC Act impact the fauna of Lowland Rainforest. For instance, the *Invasion and establishment of Cane Toad (Bufo marinus)* and *Predation by European Red Fox (Vulpes vulpes)* both have widespread impacts throughout the distribution of Lowland Rainforest. The most serious impact of these KTPs is in small remnants and the edges of larger remnants. All vertebrates are impacted with small frogs, reptiles and mammals preyed upon by the cane toad and larger predatory species poisoned when cane toads are ingested. Cane toads shelter and forage in small remnants and edges, particularly if there is suitable adjacent breeding habitat such as farm dams. The red fox also has dens in small remnants of Lowland Rainforest and forages through these and along the edges of large patches taking a range of reptiles, birds and small mammals.

Introduced mammals found in remnants of Lowland Rainforest include: black rat (*Rattus rattus*), house mouse (*Mus musculus*), hare (*Lepus capensis*), rabbit (*Oryctolagus cuniculus*), wild dog (*Canis familiaris*), European red fox (*Vulpes vulpes*) and cat (*Felis catus*). Small remnants are particularly vulnerable to feral animals (Lott and Duggin, 1993).

The significance of the threat posed by weeds is reflected by the listing of *The invasion and establishment of exotic vines and scramblers* as a Key Threatening Process under the NSW *Threatened Species Conservation Act 1995* and the *Loss and degradation of native plant and*

*animal habitat by invasion of escaped garden plants, including aquatic plants* as a Key Threatening Process under the EPBC Act.

Numerous weeds affect remnants of the Lowland Rainforest ecological community. They compete with native species for space, light and other resources but they also provide resources to other plants and animals in the ecological community. Woody weeds such as camphor laurel and tobacco bush (*Solanum mauritianum*) shade and inhibit the growth of other plants including detrimental weeds such as cat's claw creeper (*Macfadyena unguis-cati*), madeira vine (*Anredera cordifolia*), morning glory (*Ipomoea* spp.), wandering jew (*Tradescantia fluminensis*), climbing asparagus (*Asparagus plumosus*), ochna (*Ochna serrulata*) and small-leaved privet (*Ligustrum sinense*). Woody weeds can also provide an improved microclimate for rainforest seedlings to grow (Big Scrub Rainforest Landcare Group, 2008). Birds and other animals use the weeds for food and shelter, e.g. *Psophodes olivaceus* (eastern whipbird) uses lantana (*Lantana camara*) for nesting from winter to spring and numerous butterflies feed on its flowers (Big Scrub Rainforest Landcare Group, 2008).

#### Camphor laurel (*Cinnamomum camphora*)

Camphor laurel is a fast-growing woody weed that can colonise and reforest cleared ex-rainforest land. Camphor laurel dominates many abandoned pastures and edges and dominates the canopy of many regrowth patches where it shades out and competes with other vegetation. The species is known to exclude native rainforest species from establishing (by competing for space and resources) and to retard the growth of some rainforest species in its vicinity (Big Scrub Rainforest Landcare Group, 2008).

Camphor laurel is considered to be an undesirable invasive plant in productive agricultural lands and some types of native forest, but it also provides food resources and other habitat (including stepping-stones) for rainforest wildlife, and hence may contribute to regional conservation (Date et al., 1996; Neilan et al., 2006). Neilan et al. (2006) also suggest that camphor laurel facilitates the recruitment of native rainforest plants into abandoned farmland. Camphor laurel can successfully recruit in pasture and, if grazing pressure is reduced, grow rapidly amongst grasses to form a regrowth patch. Once established, camphor laurel regrowth develops a relatively complex forest structure. The moderately dense canopy cover and litter layer create shade and other physical conditions which suppress the growth of pasture grasses and herbaceous weeds, but are suitable for the germination and growth of native rainforest plants (Neilan et al., 2006). There is potential for camphor laurel stands to develop into transitional communities between abandoned pasture and regrowth rainforest (Big Scrub Rainforest Landcare Group, 2005).

It is therefore important to consider the role camphor laurel plays as a transitional ecological community when planning weed management strategies in Lowland Rainforest patches. In some areas where it dominates, camphor laurel is regarded as a rainforest type (DECCW, 2010) as it provides an important seasonal resource (Neilan et al., 2006; DECCW, 2010). However, in areas where it is not dominant and is still actively taking over areas of native vegetation such as patches of the Lowland Rainforest ecological community, it should be considered an invasive species and prevented from establishing (DECCW, 2010).

#### **Private Native Forestry**

Private native forestry is intended to be the sustainable use of native vegetation on privately-owned land in NSW for obtaining forest products including sawlogs, veneer logs, poles, girders, piles and pulp logs. Although it is excluded from vegetation patches that meet certain rainforest definitional criteria, the implementation of this management practice is threatening remnants of the Lowland Rainforest ecological community in NSW, particularly smaller remnants.

Private native forestry is excluded from areas of old growth forest and rainforest where rainforest is defined as tree-dominated vegetation where the tree stratum (over 3 m in height) has rainforest species making up 50% or more of the crown cover, except where non rainforest emergent species (including brushbox and turpentine) occur and exceed 30% or more of the upper stratum crown cover (DECC, 2007). Rainforest includes all areas of rainforest mappable at a 1:25 000 scale. Rainforest also includes areas exceeding 0.5 hectares occurring as isolated clumps or lineal strips of rainforest trees (DECC, 2007).

Private native forestry may also occur in endangered ecological communities listed under the NSW *Threatened Species Conservation Act 1995*, as part of an approved Ecological Harvesting Plan approved by the Director General of the NSW Department of Environment (DECC, 2007).

### ***Native Forest and Horticulture Plantations***

The proposal to replace stands of camphor laurel with short rotation eucalypt plantations reduces the food and habitat resources for rainforest fauna (Neilan et al., 2006). Eucalypt plantations near Lowland Rainforest remnants also increase fire risks in the ecological community (Neilan et al., 2006).

The increase in herbicide, pesticide and fertiliser use near remnants as a result of the shift from, for example, dairy farming to more intensive tropical fruit cultivation (such as avocados and macadamia plantations) potentially poses a threat to the Lowland Rainforest ecological community (Gilmour and Helman, 1991; Lott and Duggin, 1993). The impact of invading edge and weed species is also likely to be increased with this change in landuse (Gilmour and Helman, 1991). The proximity of remnants to macadamia plantations has resulted in introduced black rats becoming a pest. The impact of this species on native rodents is not known within the ecological community (Lott and Duggin, 1993) but it is likely to be negative.

### ***Grazing***

Some remnants of Lowland Rainforest are grazed by domestic stock. Cattle often damage or destroy the understorey and native ground covers and remove naturally regenerating seedlings. In doing so, they alter the species composition of Lowland Rainforest, damage the vegetation and degrade land by causing soil compaction and erosion problems.

### ***Pathogens***

Myrtle rust (*Uredo rangelii*) is part of the group of fungi that includes guava rust and eucalyptus rust (Carnegie et al., 2010). It originated in South America but was first identified in Australia in a nursery on the Central Coast of NSW in April 2010. Myrtle rust affects plants in the Myrtaceae family, including native species found in the Lowland Rainforest ecological community such as *Syzygium floribundum* (weeping lilly pilly). Plants affected by myrtle rust often suffer dieback. The rust can compromise the plants ability to thrive and reproduce and can cause the plant to eventually die. The fungus thrives in humid conditions so Lowland Rainforest is particularly susceptible to myrtle rust. Myrtle rust has spread throughout the range of Lowland Rainforest.

### ***Fragmentation***

Many patches of the ecological community now exist in very small remnants in areas where Lowland Rainforest was once widespread. Remnants are scattered through an open landscape that is largely agricultural (grazing) land. As the fragmentation of Lowland Rainforest continues, the viability of remnants as habitat for native plants and animals is threatened.

The effects of fragmentation on vertebrate fauna are better understood than effects on other groups. There is often a rapid loss of some fauna species and an increase in other species, particularly generalist species, following isolation. These ecological imbalances are likely to drive the loss of additional species in isolated patches. Thus, a Lowland Rainforest remnant may pass quickly through a series of unstable transient states until it reaches a biologically simplified equilibrium (Hunter, 1998). Fragmentation can affect invertebrate species dramatically as they are short-lived and sensitive to fine-scale environmental variation (Hunter, 1998).

Fragmentation increases the competition for resources such as food and shelter as these become more and more limiting as remnants get smaller in size (Hunter, 1998). Bird species that facilitate dispersal of a large volume and variety of plants, tend to be less abundant in fragmented forests (Moran et al., 2004b). This suggests that dispersal of certain plant species is limited in fragmented Lowland Rainforest (Moran et al., 2004b; Neilan et al., 2006).

The fragmentation of the Lowland Rainforest in the Big Scrub area has resulted in the loss of birds such as the *Atrichornis rufescens* (rufous scrub-bird) and *Dasyornis brachypterus* (eastern bristlebird) (Hunter, 1998; DECC, 2005). It has also been suggested to have caused the local extinction of *Maccullochella ikei* (Clarence River cod) due to major changes in watercourses (Hunter, 1998). The fragmentation of Lowland Rainforests has also been a major factor in the decline and near extinction of Coxen's fig parrot (Hunter, 1998).

Rainforest trees are often long-lived and may respond slowly to fragmentation. Some species may be functionally extinct in remnants before they have actually disappeared. Co-evolved pollinators or seed dispersers may have disappeared. However, for many species there may be gene flow between remnants because of movement of pollinators and seed dispersers. Remnants may therefore contribute to the genetic connectivity of a larger metapopulation and act as stepping-stones (Hunter, 1998).

### **Edge effects**

Fragmentation and the creation of patches with long edges results in physical and biotic changes which have major impacts on the ecology of the remnant. The edges of a remnant are subject to physical effects which include elevated wind turbulence and incursion, temperature variability, lateral light penetration and reduced humidity (Hunter, 1998). These changes in the physical environment of Lowland Rainforest have consequences for the plants and animals which inhabit the remnant. The species diversity of some generalist species increases near edges and some specialist rainforest species are generally uncommon near edges (Hunter, 1998). Predation on nesting birds and seeds may increase near edges and in fragments due to an influx of generalist predators from the surrounding matrix which influence the success of regeneration within remnants. Increased windshear forces may cause an increase in the frequency of treefall gaps (Hunter, 1998).

### **Climate Change**

The effects of climate change, increased human population numbers and associated human disturbances will impact on Lowland Rainforest. Climate change predictions for northern NSW and south-east Queensland indicate a shift to warmer minimum and maximum temperatures, more extreme fire event days, fewer but more intense extreme weather events such as storms with destructive winds and sea level rise (DECC, 2009). Many faunal species are expected to migrate to cooler, higher elevations. Adequate corridors of suitable vegetation will be needed to facilitate this movement. Less mobile species will be more significantly impacted by climate change (Blyth, 1991; Westoby and Burgman, 2006).

Habitat loss and fragmentation present increasingly serious problems in the context of global climate change, as smaller patches of ecological communities will be less resilient and

isolated ecological communities will have difficulty shifting their ranges to track changing environments. A potential solution is to provide *structural connectivity* i.e. elements of the landscape (typically some form of native vegetation) that physically link isolated patches of habitat. These linkages will allow individuals and/or their genes to disperse between multiple small patches, allowing these subpopulations to collectively function as larger, more resilient metapopulations (Doerr et al., 2010).

The effect of changing climate on Australian landscapes is likely to be significant because extensive land clearing and post European settlement have left fragmented remnants of native vegetation within a matrix dominated by agricultural production (Doerr et al., 2010).

### **Fire**

Unlike most other vegetation types in Australia, rainforest is not adapted to fire (Floyd, 1990a). Fire is an important factor in limiting rainforest boundaries (Bowman, 2000). Rainforest species are capable of colonising eucalypt forests and grasslands but are only likely to survive to maturity if fire is excluded until the rainforest species have formed a closed community (Bowman, 2000). However, most rainforest species can regenerate after a single fire (Bowman, 2000). It is therefore, the frequency of fires that is critical.

Weeds can substantially change fuel characteristics at rainforest boundaries (Bowman, 2000). Therefore, Lowland Rainforest remnants with a high woody weed component, or surrounded by land with a high woody weed component, are more susceptible to the impacts of fire.

## **9. How judged by the Committee in relation to the EPBC Act criteria.**

### ***Criterion 1 - Decline in geographic distribution***

#### **New South Wales**

The area of all rainforest in NSW has been reduced by about 90% since European settlement (Floyd, 1990a; Gilmour and Helman, 1991). The core area of Lowland Rainforest in the Big Scrub has been reduced from 75 000 ha to <750 ha (<1% remaining) (Floyd, 1990a; Gilmour and Helman, 1991; Big Scrub Rainforest Landcare Group, 2005). This trend has been shown to apply to the entire geographic extent of the ecological community. Detailed analysis of the NSW mapping undertaken by Flint and Cerese (unpublished) has determined that the Lowland Rainforest ecological community in NSW has been reduced from 187 280 ha to 11 170 ha. Over 94% of the ecological community has been cleared.

The current extent of Lowland Rainforest within protected areas is 1 988 ha (Flint and Cerese, unpublished). This is across 41 different national parks or reserves, however the majority is within Nightcap National Park (525 ha), Border Ranges National Park (283 ha), Mooball National Park (203 ha), Mt Jerusalem National Park (143 ha) and Inner Pocket Nature Reserve (104 ha).

#### **Queensland**

There are eight Queensland Regional Ecosystems (REs) that are considered to contain Lowland Rainforest. These are: 12.3.1, 12.5.13, 12.8.3, 12.8.4, 12.11.1, 12.11.10, 12.12.1 and 12.12.16. The remaining extent of these REs (at an altitude <300 m above sea level) ranges from 5% to >70% of that likely to exist prior to European settlement (McDonald pers. comm. 2010). However, these regional ecosystems are substantially broader than the Lowland Rainforest ecological community. Not all areas mapped as the REs will match the 'description', 'key diagnostic characteristics' and 'condition thresholds' that define the national Lowland Rainforest ecological community.

Flint and Cerese (unpublished) assessed the extent of the Lowland Rainforest ecological community in Queensland prior to European settlement to be 8 840 ha. The extent remaining today is estimated at 2 910 ha.

The extent within protected areas is 643 ha. The largest occurrences in protected areas are in Springbrook National Park (approx. 260 ha), Lamington National Park (approx. 100 ha), Kondalilla National Park (approx. 95 ha) and the Glass House Mountains National Park (approx. 70 ha).

### **Total**

The pre-European extent of the Lowland Rainforest ecological community is estimated to be 196 110 ha. The current extent is estimated to be 14 080 ha. These results indicate that there is only 7.2 % of the ecological community remaining across its range and that more than 92% of the community has been cleared since European occupation of Australia.

The estimates of decline do not take into consideration the condition of remnants. It is likely that the extent of Lowland Rainforest that remain in good condition, and meet the condition thresholds, is lower than indicated above. The Committee considers that the ecological community has undergone a **severe** decline in geographic distribution. Therefore, the ecological community has been demonstrated to have met the relevant elements of Criterion 1 to make it **eligible** for listing as **endangered**.

### ***Criterion 2 - Small geographic distribution coupled with demonstrable threat***

As detailed in Section 8 – ‘Description of Threats’, the Lowland Rainforest ecological community is subject to several ongoing demonstrable threats. Key threats include ongoing vegetation clearance, impacts associated with fragmentation of remnants and weed invasion.

The purpose of this criterion is to recognise that an ecological community with a distribution that is currently small has an inherently higher risk of extinction if it is subject to a threatening process. Thresholds to identify terrestrial vegetation communities with small distributions are typically based on three indicative measures. These are the area of occupancy, total extent of occurrence and patch size (indicative of fragmentation). If any of the three measures is demonstrated to apply to the ecological community it is considered to have a small geographic distribution.

The distribution of Lowland Rainforest occurs over a large area of eastern Australia from Maryborough in Queensland to the Hunter River in NSW. Neither the total area of occupancy or the total extent of occurrence of this ecological community are restricted. However, within its distribution it occurs in a range of patch sizes. Of the 2 683 mapped patches, 88.7% were less than 10 ha in size and only 16 patches exceed 100 ha. The average patch size for Lowland Rainforest is 5.4 ha. The fragmentation of this ecological community makes it very vulnerable to the ongoing threats such as the impacts of edge effects, limitations to dispersal mechanisms and increased vulnerability to the potential impacts of climate change.

The Committee considers that the ecological community has a **very restricted** distribution, as evidenced by highly fragmented remnants with the majority (>88%) of patches being a very small size, typically less than 10 ha. There is also clear evidence that the ecological community is subject to a range of ongoing threats that could cause it to be lost in the immediate future. Therefore, the ecological community has been demonstrated to have met the relevant elements of Criterion 2 to make it **eligible** for listing as **critically endangered**.

### ***Criterion 3 - Loss or decline of functionally important species***

The relationship between species is important for maintaining ecosystem function in the Lowland Rainforest ecological community. Frugivorous birds and mammals are important for seed dispersal of key plant species such as fig trees, quandongs, pepperberry and walnuts.

Frugivorous birds such as Coxen's fig-parrot are among other functionally important animals such as the grey-headed flying-fox that are threatened. A decline in numbers is evident in the list of over 40 animal species, which can be found in the ecological community, that are listed as threatened under national or state threatened species legislation.

The grey-headed flying-fox (Vulnerable – EPBC & NSW), is an important seed disperser for a number of Lowland Rainforest plants. Seed dispersal within and between Lowland Rainforest remnants is needed to maintain forest dynamics (Moran et al., 2004b). The grey-headed flying-fox is a key disperser likely to disperse seeds large distances. In the increasingly fragmented landscape, the functional role of this vulnerable species is increasingly important for the survival of the Lowland Rainforest ecological community.

Research has shown that the abundance of frugivorous birds (wompoo, superb and rose-crowned fruit-doves) has significantly reduced in remnants compared to extensive forest (Moran et al., 2004a,b; Neilan et al., 2006). This suggests that the birds have a minimum habitat requirement and that suitable food resources and habitat are absent or in very low abundance in pioneer vegetation and some smaller patches (Moran et al., 2004a).

It seems likely that the reduced numbers of functionally important frugivorous birds in fragmented and disturbed habitats would change the composition and rate of seed dispersal in these habitats. In addition, there is an increase in smaller birds (varied triller and the silvereye) that are likely to feed on small-seeded sugary fruits in regrowth compared to remnants and extensive forest (Moran et al., 2004b). These birds are often associated with the consumption of the seeds and fruits of introduced weeds which are typically found in abundance in fragmented parts of the landscape (Moran et al., 2004b). Although subsequent seedling germination and plant establishment, growth and reproduction are affected by a number of biotic and abiotic factors, initial seed input to a site is essential, especially in a cleared landscape.

It has been demonstrated that there is a severe change in the composition of the functionally important bird species found in the fragmented Lowland Rainforest ecological community (Moran et al., 2004a,b; Neilan et al., 2006) and, in turn, a change in the composition of plant species with a likely decrease in native species and increase in introduced species (Moran et al., 2004b). The ability of the ecological community to restore relatively quickly (with human intervention) does allow the community to re-establish a rainforest-like state and provide habitat for some rainforest dependant biota but it does not enable the ecological community to regenerate to its original state, including the restoration of all functionally important bird populations. Complete regeneration of Lowland Rainforest may take more than 44 years (Kariuki and Kooyman, 2005) and possibly as long as 800 years (Hopkins, 1990) and is unlikely in the **near future** (Summerbell, 1991; Kanowski et al., 2009). Therefore, the ecological community has been demonstrated to have met the relevant elements of Criterion 3 to make it **eligible** for listing under this criterion as **endangered**.

#### **Criterion 4 - Reduction in community integrity**

##### Reduction in integrity through the loss of key vegetative components

In many remaining areas the species composition of the ecological community has changed. Introduced species such as camphor laurel can dominate many patches of Lowland Rainforest, out-competing native vegetation and in some cases, reducing the integrity of a patch so much that it is no longer considered part of the ecological community. The grazing of domestic animals such as cattle in patches of Lowland Rainforest also reduces the ability of native plant species to regenerate.

The size of individual remnants has been shown to affect species diversity in the Big Scrub area (Lott and Duggin, 1993). Smaller remnants (<10 ha) characteristically have a lower species diversity. Small remnants are also prone to chance removal of diagnostic tree species through clearing and its subsequent effects and invasion by other species (Lott and Duggin, 1993).

Lowland Rainforest also supports a number of rare and/or threatened plants species such as *Davidsonia jerseyana* (Davidson's plum) (Endangered-EPBC, Endangered-NSW). Many Lowland Rainforest remnants (>80%) are not protected in national parks (Flint and Cerase, unpublished) despite their importance in the conservation of these rare and/or threatened flora and their role in the maintenance of community integrity.

##### Reduction in integrity through loss of key faunal components

The number of frugivorous birds in subtropical Australia has decreased following extensive clearing of rainforests especially in lowland areas (Date et al., 1991; Moran et al., 2004a). Frugivorous birds play an important role in the ecological community as they are highly mobile and are among the most likely to carry plant seeds across cleared land. Seed dispersal within and between Lowland Rainforest remnants is needed to maintain forest dynamics.

Big Scrub data (Lott and Duggin, 1993) indicates that the size of a remnant affects its ability to support mammals. Remnants less than 20 ha in size did not contain *Rattus fuscipes* (bush rat). Similarly, *Antechinus stuartii* (brown antechinus, Stuart's antechinus) is only found in one remnant outside the Nightcap National Park/Whian Whian area (Lott and Duggin, 1993). Predation by cats and dogs may have eliminated these species from the smaller remnants, however, the presence of a dense groundcover has also been found to be important for these native mammal species (Lott and Duggin, 1993). *Thylogale thetis* (red-necked pademelon) is also absent in smaller Big Scrub remnants. The known small size of the home range of these mammal species suggests that they should be able to survive in many of the smaller remnants. The fact that they are absent indicates that other factors such as the availability of food and shelter, and predation reduce the integrity of the ecological community to a level that prevents pademelons and rodents from inhabiting the smaller remnants.

The Lowland Rainforest ecological community is habitat for over 40 animal species listed as threatened at the national or state level. It can be inferred that the decline in the abundance of these species indicates a decline in the quality of habitat the ecological community is providing as well as indicating a reduction in ecological processes reliant on the interaction of plant and animal species within the ecological community.

### Reduction in integrity through weed invasion

The ecological community is threatened by more than 130 weed species (Big Scrub Rainforest Landcare Group, 2005). These weeds compete with native species for space, light and resources. Lantana is also known to smother native species and the toxicity of camphor laurel is thought to inhibit the growth of some native species (Big Scrub Rainforest Landcare Group, 2005). Although the regeneration of the ecological community is possible if weeds are removed, it has been shown that complete regeneration may take more than 44 years (Kariuki and Kooyman, 2005) and possibly as long as 800 years (Hopkins, 1990).

### Reduction in integrity through fragmentation and degradation of habitat

Extensive fragmentation of the ecological community into isolated and disconnected remnants has ecological implications. Fragments with a high edge to area ratio are more susceptible to disturbances and adverse influences from the surrounding agricultural landscape, such as weeds and spray drift. Disconnected remnants can also affect the dispersal and movement of wildlife and plant propagules. Small remnants may also prove to be less suitable habitat for some native species e.g. bush rat, Stuart's antechinus and red-necked pademelon.

Despite the negative impacts of the fragmentation of the ecological community, it is important to highlight the significance of small and/or isolated patches. Some isolated remnants are too small to support all rainforest dependant species together but the occurrence of rainforest dependant species in scattered locations throughout the Big Scrub (despite the long periods of isolation) indicates that they are important stepping-stones between larger remnants providing supplementary food and allowing bird movement and therefore seed dispersal within and between remnants (Lott and Duggin, 1993; Moran et al., 2004a,b).

### Summary

The Committee considers that the Lowland Rainforest ecological community has undergone a **severe** reduction in its ecological integrity across most of its distribution, demonstrated by several indicators of severe degradation and disruption of important ecological processes. There is a high incidence of weeds in the ecological community and key floral and faunal components have declined. The ecological community currently exists in a highly fragmented state which has the capacity to exacerbate the impacts from ongoing threats and disturbance. It is unlikely that the ecological community will recover its full ecological integrity in the **near future**, even with positive human intervention. Therefore the ecological community is **eligible** for listing as **endangered** under this criterion.

### ***Criterion 5 - Rate of continuing detrimental change***

The Lowland Rainforest ecological community has undergone a severe decline in geographic distribution that has resulted in the remaining Lowland Rainforest being highly fragmented and vulnerable to disturbance. Exposure to an altered physical environment (light, temperature and wind) particularly on edges has continued detrimental effects on the ecological community. Disturbance of the canopy in Lowland Rainforest often promotes the growth of alien vines (that smother native trees and further disrupt the canopy) and alien groundcovers (that suppress the regeneration of other rainforest plants) (Kanowski et al., 2009). The impact of exotic weeds in this community is increased with increasing fragmentation and smaller patch sizes. The ability of the fragmented ecological community to support native flora and fauna and important ecological processes such as seed dispersal and pollination has also been reduced (Moran et al., 2004b; Big Scrub Rainforest Landcare Group, 2005).

The detrimental change occurring in this ecological community has been demonstrated by the number of threatened species associated with the ecological community, the severe decline in its geographic distribution and the disruption of ecological processes that has occurred. There is an indication that decline in the condition of Lowland Rainforest remnants is continuing and that a significant investment in ongoing maintenance, in the form of weed control and in some cases supplementary planting, is required to avoid a further increase in the rate of continuing detrimental change. However, data on the rate of change are not available to support this, therefore the ecological community is **not eligible** for listing under Criterion 5.

***Criterion 6 - Quantitative analysis showing probability of extinction***

There are no quantitative data available to assess the ecological community under this criterion. Therefore, it is **not eligible** for listing under this criterion.

## 10. Conclusion

### *Conservation status*

This advice follows the assessment of information to include the Lowland Rainforest of Subtropical Australia ecological community in the list of threatened ecological communities referred to in Section 181 of the EPBC Act. The Lowland Rainforest of Subtropical Australia ecological community meets:

- Criterion 1 as **endangered** because its decline in geographic distribution is severe; and
- Criterion 2 as **critically endangered** because its geographic distribution is very restricted and the nature of its distribution makes it likely that the action of a threatening process could cause it to be lost in the immediate future;
- Criterion 3 as **endangered** because the decline of functionally important species is severe and restoration is unlikely to be possible in the near future;
- Criterion 4 as **endangered** because the ecological community has undergone a severe reduction in community integrity such that regeneration is unlikely within the near future.

The highest category for which the ecological community is **eligible** to be listed is **critically endangered**.

### *Recovery Plan*

Due to a number of existing management plans relevant to the ecological community, the Committee considers that a recovery plan specific to the Lowland Rainforest of Subtropical Australia ecological community is a low priority. In particular, management actions relevant to the ecological community can be found in the Northern Rivers Regional Biodiversity Management Plan (DEWHA, 2010b).

## 11. Recommendations

The Committee recommends that:

- i. The list referred to in section 181 of the EPBC Act be amended by **including** in the list in the **critically endangered** category:

### **Lowland Rainforest of Subtropical Australia;**

- ii. The Minister decides not to have a recovery plan for this ecological community.
- iii. The Minister provides the following reasons for his decision not to have a recovery plan:

A recovery plan is not required at this time. The planning, implementation and coordination of recovery actions does not involve complexity beyond that which can be managed through existing management plans and processes. A conservation advice is also available that details the priority recovery actions required for this ecological community.

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| <b>Appendix A<br/>Characteristic Flora Species</b> | <b>common name</b>                       | <b>synonym</b>                            |
|----------------------------------------------------|------------------------------------------|-------------------------------------------|
| <i>Acacia bakeri</i>                               | marblewood                               |                                           |
| <i>Acacia chrysotricha</i>                         | Newry golden wattle                      |                                           |
| <i>Acalypha eremorum</i>                           | acalypha                                 |                                           |
| <i>Ackama paniculata</i>                           | soft corkwood, rose-leaved marara        | <i>Caldcluvia paniculosa</i>              |
| <i>Acmena ingens</i>                               | red apple; southern satinash             | <i>Syzygium ingens</i>                    |
| <i>Acmena smithii</i>                              | lilly pilly, lillipilli satinash         | <i>Syzygium smithii</i>                   |
| <i>Acradenia euodiiformis</i>                      | bonewood                                 |                                           |
| <i>Acronychia baeuerlenii</i>                      | Byron Bay acronychia                     |                                           |
| <i>Actephila lindleyi</i>                          | actephila                                |                                           |
| <i>Alphitonia excelsa</i>                          | red ash soapbush                         |                                           |
| <i>Amyema plicatula</i>                            |                                          | <i>Amyema scandens</i>                    |
| <i>Angiopteris evecta</i>                          | giant fern                               |                                           |
| <i>Anopterus macleayanus</i>                       | Macleay laurel                           |                                           |
| <i>Anthocarapa nitidula</i>                        | incense tree, bog onion                  |                                           |
| <i>Aphananthe philippinensis</i>                   | rough leaved elm, grey handlewood        |                                           |
| <i>Araucaria cunninghamii</i>                      | hoop pine                                |                                           |
| <i>Archidendron hendersonii</i>                    | white laceflower                         |                                           |
| <i>Archidendron muellerianum</i>                   | veiny laceflower                         |                                           |
| <i>Archontophoenix cunninghamiana</i>              | bangalow palm                            |                                           |
| <i>Ardisia bakeri</i>                              | ardisia bakeri                           |                                           |
| <i>Argyrodendron actinophyllum</i>                 | black booyong                            |                                           |
| <i>Argyrodendron trifoliolatum</i>                 | white booyong                            | <i>Heritiera trifoliata</i>               |
| <i>Arthraxon hispidus</i>                          | hairy jointgrass                         |                                           |
| <i>Arthropteris palisotii</i>                      | lesser creeping fern                     |                                           |
| <i>Arytera distylis</i>                            | twin-leaved coogera                      |                                           |
| <i>Asperula asthenes</i>                           | trailing woodruff                        |                                           |
| <i>Asplenium australasicum</i>                     | bird's nest fern                         |                                           |
| <i>Atractocarpus chartaceus</i>                    |                                          |                                           |
| <i>Baloghia inophylla</i>                          | brush bloodwood, scrub bloodwood         | <i>Baloghia lucida</i>                    |
| <i>Baloghia marmorata</i>                          | jointed baloghia                         |                                           |
| <i>Beilschmiedia elliptica</i>                     |                                          |                                           |
| <i>Belvisia mucronata</i>                          | needle-leaf fern                         |                                           |
| <i>Bosistoa transversa</i>                         | yellow satinheart, heart-leaved bonewood | <i>Bosistoa selwynii</i>                  |
| <i>Brachychiton acerifolius</i>                    | flame tree                               |                                           |
| <i>Breynia oblongifolia</i>                        | coffee bush                              |                                           |
| <i>Bridelia exaltata</i>                           | brush ironbark                           |                                           |
| <i>Bulbophyllum globuliforme</i>                   | hoop pine orchid                         |                                           |
| <i>Calamus muelleri</i>                            | vine                                     |                                           |
| <i>Callicoma serratifolia</i>                      | black wattle, callicoma                  |                                           |
| <i>Capparis arborea</i>                            | brush caper berry                        |                                           |
| <i>Cassia marksiana</i>                            | brush cassia                             | <i>C. brewsteri</i> var. <i>marksiana</i> |
| <i>Castanospermum australe</i>                     | black bean                               |                                           |
| <i>Ceratopetalum apetalum</i>                      | coachwood                                |                                           |
| <i>Choricarpia subargentea</i>                     | giant ironwood                           |                                           |
| <i>Cinnamomum oliveri</i>                          | Oliver's sassafrass, camphorwood         |                                           |
| <i>Cissus antarctica</i>                           | native grape vine, water vine            |                                           |
| <i>Cissus hypoglauca</i>                           | giant water vine                         |                                           |

| <b>Appendix A<br/>Characteristic Flora Species cont.</b> | <b>common name</b>                      | <b>synonym</b>                     |
|----------------------------------------------------------|-----------------------------------------|------------------------------------|
| <i>Citrus australasica</i>                               | finger lime                             |                                    |
| <i>Cleistanthus cunninghamii</i>                         | cleistanthus, omega                     |                                    |
| <i>Clematis fawcettii</i>                                | northern clematis                       |                                    |
| <i>Clerodendrum floribundum</i>                          |                                         |                                    |
| <i>Coatesia paniculata</i>                               | axe-breaker                             | <i>Geijera paniculata</i>          |
| <i>Commersonia bartramia</i>                             |                                         |                                    |
| <i>Cordyline congesta</i>                                | palm lily                               |                                    |
| <i>Cordyline rubra</i>                                   | red-fruited palm-lily                   |                                    |
| <i>Corokia whiteana</i>                                  | corokia                                 |                                    |
| <i>Corynocarpus rupestris</i> subsp. <i>arborescens</i>  | southern corynocarpus                   |                                    |
| <i>Cryptocarya foetida</i>                               | stinking cryptocarya                    |                                    |
| <i>Cryptocarya obovata</i>                               | pepperberry tree, white walnut          |                                    |
| <i>Cupaniopsis newmanii</i>                              | cupaniopsis newmanii                    |                                    |
| <i>Cupaniopsis serrata</i>                               | smooth tuckeroo                         |                                    |
| <i>Cynanchum elegans</i>                                 | white-flowered wax plant                |                                    |
| <i>Davidsonia jerseyana</i>                              | Davidson's plum                         |                                    |
| <i>Davidsonia johnsonii</i>                              | smooth Davidson's plum                  |                                    |
| <i>Dendrobium speciosum</i>                              | rock lily                               |                                    |
| <i>Dendrocnide excelsa</i>                               | giant stinging tree                     |                                    |
| <i>Dendrocnide moroides</i>                              | Gympie stinger                          |                                    |
| <i>Desmodium acanthocladum</i>                           | thorny pea                              |                                    |
| <i>Dioscorea transversa</i>                              | native yam                              |                                    |
| <i>Diospyros mabacea</i>                                 | red-fruited ebony                       |                                    |
| <i>Diospyros major</i> var. <i>ebenus</i>                | shiny-leaved ebony                      |                                    |
| <i>Diospyros pentamera</i>                               | myrtle ebony, grey persimmon, grey plum |                                    |
| <i>Diploglottis australis</i>                            | native tamarind                         | <i>Diploglottis cunninghamii</i>   |
| <i>Diploglottis campbellii</i>                           | small-leafed tamarind                   |                                    |
| <i>Dysoxylum fraserianum</i>                             | rosewood                                |                                    |
| <i>Dysoxylum mollissimum</i>                             | red bean, Miva mahogany                 |                                    |
| <i>Dysoxylum rufum</i>                                   | hairy rosewood, rusty mahogany          |                                    |
| <i>Elaeocarpus grandis</i>                               |                                         |                                    |
| <i>Elaeocarpus obovatus</i>                              | hard quandong                           |                                    |
| <i>Elattostachys nervosa</i>                             | green tamarind                          |                                    |
| <i>Elaeocarpus sedentarius</i>                           | Minyon quandong, Rocky Creek quandong   | <i>Elaeocarpus</i> sp. Rocky creek |
| <i>Elaeocarpus williamsianus</i>                         | hairy quandong                          |                                    |
| <i>Endiandra floydii</i>                                 | Crystal Creek walnut                    |                                    |
| <i>Endiandra globosa</i>                                 |                                         |                                    |
| <i>Endiandra hayesii</i>                                 | rusty rose walnut                       |                                    |
| <i>Endiandra muelleri</i> subsp. <i>bracteata</i>        | green-leaved rose walnut                |                                    |
| <i>Endiandra pubens</i>                                  |                                         |                                    |
| <i>Eupomatia bennettii</i>                               | small bolwarra                          |                                    |
| <i>Eustrephus latifolius</i>                             | wombat berry                            |                                    |
| <i>Ficus</i> spp.                                        | figs                                    |                                    |
| <i>Ficus coronata</i>                                    | creek sandpaper fig                     |                                    |
| <i>Ficus fraseri</i>                                     | sandpaper fig                           |                                    |

| <b>Appendix A<br/>Characteristic Species cont.</b> | <b>common name</b>                                       | <b>synonym</b>                         |
|----------------------------------------------------|----------------------------------------------------------|----------------------------------------|
| <i>Ficus macrophylla</i>                           | Moreton Bay fig                                          |                                        |
| <i>Ficus obliqua</i>                               | small leaved fig                                         |                                        |
| <i>Ficus watkinsiana</i>                           | strangling fig                                           |                                        |
| <i>Flindersia australis</i>                        | native teak, crows ash                                   |                                        |
| <i>Flindersia schottiana</i>                       | bumpy ash                                                |                                        |
| <i>Flindersia xanthoxyla</i>                       | long jack, yellowwood                                    |                                        |
| <i>Floydia praealta</i>                            | ball nut                                                 |                                        |
| <i>Fontainea australis</i>                         | southern fontainea                                       |                                        |
| <i>Fontainea oraria</i>                            | coastal fontainea                                        |                                        |
| <i>Geitonoplesium cymosum</i>                      |                                                          |                                        |
| <i>Glochidion ferdinandi</i>                       | cheese tree, buttonwood                                  |                                        |
| <i>Gmelina leichhardtii</i>                        | white beech                                              |                                        |
| <i>Gossia bidwillii</i>                            |                                                          |                                        |
| <i>Gossia fragrantissima</i>                       | sweet myrtle                                             |                                        |
| <i>Grammitis stenophylla</i>                       | narrow-leaved finger-fern                                |                                        |
| <i>Grevillea hilliania</i>                         | white yiel yiel                                          |                                        |
| <i>Grevillea robusta</i>                           | silky oak                                                |                                        |
| <i>Guioa semiglauca</i>                            | guioa                                                    |                                        |
| <i>Helicia glabriflora</i>                         | smooth or pale helicia, pale oak, leather oak, brown oak |                                        |
| <i>Helmholtzia glaberrima</i>                      |                                                          |                                        |
| <i>Hicksbeachia pinnatifolia</i>                   | red boppel nut                                           |                                        |
| <i>Hymenosporum flavum</i>                         |                                                          |                                        |
| <i>Isoglossa eranthemoides</i>                     | isoglossa                                                |                                        |
| <i>Jagera pseudorhus</i>                           | foambark                                                 |                                        |
| <i>Lenwebbia prominens</i>                         | velvet myrtle                                            |                                        |
| <i>Lepiderema pulchella</i>                        | fine-leaved tuckeroo                                     |                                        |
| <i>Lindsaea brachypoda</i>                         | short-footed screw fern                                  |                                        |
| <i>Linospadix monostachya</i>                      | walking stick palm                                       | <i>Linospadix monostachyos</i>         |
| <i>Litsea australis</i>                            |                                                          |                                        |
| <i>Livistona australis</i>                         | cabbage tree palm                                        |                                        |
| <i>Lophostemon confertus</i>                       | brushbox                                                 |                                        |
| <i>Macadamia integrifolia</i>                      | macadamia nut                                            |                                        |
| <i>Macadamia tetraphylla</i>                       | rough-shelled bush nut                                   |                                        |
| <i>Maclura cochinchinensis</i>                     | cockspur thorn                                           |                                        |
| <i>Mallotus discolor</i>                           |                                                          |                                        |
| <i>Mallotus philippensis</i>                       | red kamala                                               |                                        |
| <i>Marsdenia longiloba</i>                         | slender marsdenia                                        |                                        |
| <i>Melia azedarach</i>                             | white cedar                                              |                                        |
| <i>Melicope micrococca</i>                         |                                                          |                                        |
| <i>Melicope vitiflora</i>                          |                                                          |                                        |
| <i>Morinda jasminoides</i>                         |                                                          |                                        |
| <i>Myrsine richmondensis</i>                       | ripple-leaf muttonwood                                   | <i>Rapanea</i> sp.<br>'Richmond River' |
| <i>Neolitsea australiensis</i>                     | bolly gum                                                |                                        |
| <i>Neolitsea dealbata</i>                          |                                                          |                                        |
| <i>Niemeyera chartacea</i>                         |                                                          |                                        |

| <b>Appendix A<br/>Characteristic Species cont.</b> | <b>common name</b>                           | <b>synonym</b>                |
|----------------------------------------------------|----------------------------------------------|-------------------------------|
| <i>Niemeyera whitei</i>                            | rusty plum                                   | <i>Amorphospermum whitei</i>  |
| <i>Notelaea johnsonii</i>                          | veinless mockolive                           |                               |
| <i>Notelaea longifolia</i>                         | mock olive                                   |                               |
| <i>Oberonia complanata</i>                         | yellow-flowered king of the fairies          |                               |
| <i>Oberonia titania</i>                            | red-flowered king of the fairies             |                               |
| <i>Ochrosia moorei</i>                             | southern ochrosia                            |                               |
| <i>Owenia cepiodora</i>                            | onion cedar                                  |                               |
| <i>Pandorea floribunda</i>                         | wonga wonga vine                             |                               |
| <i>Pararchidendron pruinosum</i>                   | snow wood                                    |                               |
| <i>Pararistolochia praevenosa</i>                  |                                              |                               |
| <i>Parsonsia straminea</i>                         |                                              |                               |
| <i>Pellaea falcata</i>                             |                                              |                               |
| <i>Pentaceras australe</i>                         | penta ash, bastard crow's ash                |                               |
| <i>Peristeranthus hillii</i>                       | brown fairy-chain orchid                     |                               |
| <i>Phyllanthus microcladus</i>                     | brush sauropus                               |                               |
| <i>Pittosporum multiflorum</i>                     | orange thorn                                 |                               |
| <i>Pittosporum revolutum</i>                       | hairy pittosporum, rough-fruited pittosporum |                               |
| <i>Pittosporum undulatum</i>                       | sweet pittosporum                            |                               |
| <i>Planchonella australis</i>                      | black apple                                  | <i>Pouteria australis</i>     |
| <i>Platynerium bifurcatum</i>                      |                                              |                               |
| <i>Platynerium superbum</i>                        | staghorn fern                                |                               |
| <i>Plectranthus nitidus</i>                        | Nightcap plectranthus                        |                               |
| <i>Polia crispata</i>                              |                                              |                               |
| <i>Polyscias elegans</i>                           | silver basswood, celerywood                  |                               |
| <i>Pomaderris notata</i>                           | McPherson Range pomaderris                   |                               |
| <i>Psilotum complanatum</i>                        | flat fork fern                               |                               |
| <i>Samadera</i> sp. Mt Nardi (B.L.Walker AQ330746) | southern quassia                             |                               |
| <i>Quintinia verdonii</i>                          | grey possumwood, smooth possumwood           |                               |
| <i>Randia moorei</i>                               | spiny gardenia                               |                               |
| <i>Rhodamnia maideniana</i>                        | smooth scrub turpentine                      |                               |
| <i>Rhodamnia rubescens</i>                         |                                              |                               |
| <i>Sarcochilus dilatatus</i>                       | brown butterfly orchid                       |                               |
| <i>Sarcochilus fitzgeraldii</i>                    | ravine orchid                                |                               |
| <i>Sarcochilus weinthalii</i>                      | blotched sarcochilus                         |                               |
| <i>Sarcomelicope simplicifolia</i>                 |                                              |                               |
| <i>Sarcopteryx stipata</i>                         | steelwood, corduroy                          |                               |
| <i>Senna acclinis</i>                              | rainforest cassia                            |                               |
| <i>Sloanea australis</i>                           | maidens blush, blush alder                   |                               |
| <i>Sloanea woollsii</i>                            | yellow carabeen                              |                               |
| <i>Smilax australis</i>                            | sarsaparilla                                 |                               |
| <i>Sophora fraseri</i>                             | brush sophora                                |                               |
| <i>Stephania japonica</i> var. <i>discolor</i>     |                                              |                               |
| <i>Streblus pendulinus</i>                         | whalebone tree                               | <i>Streblus brunonianus</i>   |
| <i>Syzygium australe</i>                           | brush cherry, creek satinash                 |                               |
| <i>Syzygium crebrinerve</i>                        | purple cherry, rose satinash                 |                               |
| <i>Syzygium floribundum</i>                        | weeping lilly pilly, weeping satinash        | <i>Waterhousea floribunda</i> |
|                                                    |                                              |                               |

| <b>Appendix A<br/>Characteristic Species cont.</b> | <b>common name</b>            | <b>synonym</b>                     |
|----------------------------------------------------|-------------------------------|------------------------------------|
| <i>Syzygium francisii</i>                          | giant watergum, rose satinash |                                    |
| <i>Syzygium hodgkinsoniae</i>                      | red lilly pilly               |                                    |
| <i>Syzygium moorei</i>                             | durobby, coolamon, rose apple |                                    |
| <i>Tabernaemontana pandacqui</i>                   | banana bush, windmill bush    | <i>Ervatamia<br/>angustisepala</i> |
| <i>Triflorensia cameronii</i>                      | Cameron's tarenna             | <i>Tarenna cameronii</i>           |
| <i>Tinospora tinosporoides</i>                     | arrow-head vine               |                                    |
| <i>Toeckima dassyrrhache</i>                       | blunt-leaved steelwood        |                                    |
| <i>Toona ciliata</i>                               | red cedar                     | <i>Toona australis</i>             |
| <i>Triunia youngiana</i>                           | honeysuckle bush, spice bush  |                                    |
| <i>Wilkiea austroqueenslandica</i>                 | smooth wilkiea                |                                    |
| <i>Wilkiea hugeliana</i>                           | veiny wilkiea                 | <i>Wilkiea huegeliana</i>          |
| <i>Zieria collina</i>                              |                               |                                    |

| <b>Appendix B<br/>Persistent Residual Trees</b> | <b>common name</b>                      | <b>synonym</b>                   |
|-------------------------------------------------|-----------------------------------------|----------------------------------|
| <i>Acmena ingens</i>                            | red apple, southern satinash            | <i>Syzygium ingens</i>           |
| <i>Acmena smithii</i>                           | lilly pilly, lillipilli satinash        | <i>Syzygium smithii</i>          |
| <i>Alphitonia excelsa</i>                       | red ash                                 |                                  |
| <i>Aphananthe philippinensis</i>                | rough leaved elm, grey handlewood       |                                  |
| <i>Araucaria cunninghamii</i>                   | hoop pine                               |                                  |
| <i>Archontophoenix cunninghamiana</i>           | bangalow palm                           |                                  |
| <i>Argyrodendron trifoliolatum</i>              | white booyong                           | <i>Heritiera trifoliolata</i>    |
| <i>Brachychiton acerifolius</i>                 | flame tree                              |                                  |
| <i>Castanospermum australe</i>                  | black bean                              |                                  |
| <i>Cryptocarya obovata</i>                      | pepperberry tree, white walnut          |                                  |
| <i>Dendrocnide excelsa</i>                      | giant stinging tree                     |                                  |
| <i>Diospyros pentamera</i>                      | myrtle ebony, grey persimmon, grey plum |                                  |
| <i>Diploglottis australis</i>                   | native tamarind                         | <i>Diploglottis cunninghamii</i> |
| <i>Dysoxylum fraserianum</i>                    | rosewood                                |                                  |
| <i>Dysoxylum mollissimum</i>                    | red bean, Miva mahogany                 |                                  |
| <i>Elaeocarpus obovatus</i>                     | hard quandong                           |                                  |
| <i>Elattostachys nervosa</i>                    | green tamarind                          |                                  |
| <i>Endiandra pubens</i>                         |                                         |                                  |
| <i>Ficus coronata</i>                           | creek sandpaper fig                     |                                  |
| <i>Ficus fraseri</i>                            | sandpaper fig                           |                                  |
| <i>Ficus macrophylla</i>                        | Moreton Bay fig                         |                                  |
| <i>Ficus obliqua</i>                            | small leaved fig                        |                                  |
| <i>Ficus watkinsiana</i>                        | strangling fig                          |                                  |
| <i>Flindersia australis</i>                     | native teak, crows ash                  |                                  |
| <i>Flindersia schottiana</i>                    | bumpy ash                               |                                  |
| <i>Flindersia xanthoxyla</i>                    | long jack, yellowwood                   |                                  |
| <i>Glochidion ferdinandii</i>                   |                                         |                                  |
| <i>Glochidion ferdinandii</i>                   | cheese tree, buttonwood                 |                                  |
| <i>Gmelina leichhardtii</i>                     | white beech                             |                                  |
| <i>Grevillea robusta</i>                        | silky oak                               |                                  |
| <i>Guioa semiglauc</i>                          |                                         |                                  |
| <i>Livistona australis</i>                      | cabbage tree palm                       |                                  |
| <i>Lophostemon confertus</i>                    | brushbox                                |                                  |
| <i>Neolitsea australiensis</i>                  |                                         |                                  |
| <i>Neolitsea dealbata</i>                       |                                         |                                  |
| <i>Notelaea johnsonii</i>                       | veinless mockolive                      |                                  |
| <i>Sloanea australis</i>                        | maidens blush, blush alder              |                                  |
| <i>Sloanea woollsii</i>                         | yellow carabeen                         |                                  |
| <i>Streblus pendulinus</i>                      | whalebone tree                          | <i>Streblus brunonianus</i>      |
| <i>Syzygium floribundum</i>                     | weeping lilly pilly, weeping satinash   | <i>Waterhousea floribunda</i>    |
| <i>Syzygium hodgkinsoniae</i>                   | red lilly pilly                         |                                  |
| <i>Toona ciliata</i>                            | red cedar                               | <i>Toona australis</i>           |

| <b>Appendix C Fauna Birds</b>         |                                            | <b>C'wealth (EPBC Act)</b> | <b>NSW (TSC Act*)</b> | <b>QLD (NCA 1992)</b> |
|---------------------------------------|--------------------------------------------|----------------------------|-----------------------|-----------------------|
| <i>Accipiter novaehollandiae</i>      | Grey Goshawk                               |                            |                       | R                     |
| <i>Ailuroedus crassirostris</i>       | Green Catbird                              |                            |                       |                       |
| <i>Alectura lathamii</i>              | Australian Brush Turkey                    |                            |                       |                       |
| <i>Alisteris scapulatis</i>           | Australian King Parrot                     |                            |                       |                       |
| <i>Anthochaera chrysoptera</i>        | Little Wattlebird                          |                            |                       |                       |
| <i>Cacuata galerita</i>               | Sulphur-crested Cockatoo                   |                            |                       |                       |
| <i>Carterornis leucotis</i>           | White-eared Monarch                        |                            | V                     |                       |
| <i>Chalcophaps indica</i>             | Emerald Dove                               |                            |                       |                       |
| <i>Colluricincla megarhyncha</i>      | Little Shrike-thrush                       |                            |                       |                       |
| <i>Columba leucomela</i>              | White-headed Pigeon                        |                            |                       |                       |
| <i>Coracina lineata</i>               | Barred Cuckoo-shrike                       |                            |                       |                       |
| <i>Coracina novaehollandiae</i>       | Black-faced Cuckoo-shrike                  |                            |                       |                       |
| <i>Corvus orru</i>                    | Torresian crow                             |                            |                       |                       |
| <i>Cracticus tibicen</i>              | Australian Magpie                          |                            |                       |                       |
| <i>Cracticus torquatus</i>            | Grey Butcherbird                           |                            |                       |                       |
| <i>Cyclopsitta diophthalma coxeni</i> | Coxen's Fig-parrot, Double-eyed Fig-parrot | E                          | E                     | E                     |
| <i>Dicaeum hirundinaceum</i>          | Mistletoe Bird                             |                            |                       |                       |
| <i>Dicrurus bracteatus</i>            | Spangled Drongo                            |                            |                       |                       |
| <i>Eolophus roseicapillus</i>         | Galah                                      |                            |                       |                       |
| <i>Erythrorhynchus radiatus</i>       | Red Goshawk                                | V                          | E                     | E                     |
| <i>Geopelia humeralis</i>             | Bar-shouldered Dove                        |                            |                       |                       |
| <i>Gerygone mouki</i>                 | Brown Gerygone                             |                            |                       |                       |
| <i>Lalage leucomela</i>               | Varied Triller                             |                            |                       |                       |
| <i>Leucosarcia melanoleuca</i>        | Wonga Pigeon                               |                            |                       |                       |
| <i>Lopholaimus antarcticus</i>        | Topknot Pigeon                             |                            |                       |                       |
| <i>Macropygia amboinensis</i>         | Brown cuckoo-dove                          |                            |                       |                       |
| <i>Meliphaga lewinii</i>              | Lewin's Honeyeater                         |                            |                       |                       |
| <i>Menura alberti</i>                 | Albert's Lyrebird                          |                            | V                     | R                     |
| <i>Myzomela sanguinolenta</i>         | Scarlet Honeyeater                         |                            |                       |                       |
| <i>Oriolus sagittatus</i>             | Olive-backed Oriole                        |                            |                       |                       |
| <i>Orthonyx temminckii</i>            | Australian Logrunner                       |                            |                       |                       |
| <i>Pachycephala pectoralis</i>        | Golden Whistler                            |                            |                       |                       |
| <i>Petroica rosea</i>                 | Rose Robin                                 |                            |                       |                       |
| <i>Philemon corniculatus</i>          | Noisy Friarbird                            |                            |                       |                       |
| <i>Pitta versicolor</i>               | Noisy Pitta                                |                            |                       |                       |
| <i>Platycercu adscitus</i>            | Pale-headed Rosella                        |                            |                       |                       |
| <i>Platycercus elegans</i>            | Crimson Rosella                            |                            |                       |                       |
| <i>Podargus ocellatus plumiferus</i>  | Marbled Frogmouth                          |                            | V                     | V                     |
| <i>Psophodes olivaceus</i>            | Weastern Whipbird                          |                            |                       |                       |
| <i>Ptilinopus magnificus</i>          | Wampoo Fruit-dove                          |                            | V                     |                       |
| <i>Ptilinopus regina</i>              | Rose-crowned Fruit-dove                    |                            |                       |                       |
| <i>Ptilinopus superbus</i>            | Superb Fruit-dove                          |                            | V                     |                       |
| <i>Ptilinorhynchus violaceus</i>      | Satin Bowerbird                            |                            |                       |                       |
| <i>Ptiloris paradiseus</i>            | Paradise Riflebird                         |                            |                       |                       |
| <i>Rhipidura albiscapa</i>            | Grey Fantail                               |                            |                       |                       |
| <i>Scythrops novaehollandiae</i>      | Channel-billed Cuckoo                      |                            |                       |                       |
| <i>Sericulus chrysocephalus</i>       | Regent Bowerbird                           |                            |                       |                       |

| <b>Appendix C Fauna</b>              |                                      | <b>C'wealth<br/>(EPBC Act)</b> | <b>NSW<br/>(TSC Act*)</b> | <b>QLD<br/>(NCA<br/>1992)</b> |
|--------------------------------------|--------------------------------------|--------------------------------|---------------------------|-------------------------------|
| <b>Birds cont.</b>                   |                                      |                                |                           |                               |
| <i>Sphecotheres vieilloti</i>        | Australasian Figbird                 |                                |                           |                               |
| <i>Sphecotheres viridis</i>          | Figbird                              |                                |                           |                               |
| <i>Strepera graculina</i>            | Pied Currawong                       |                                |                           |                               |
| <i>Symposiachrus trivirgatus</i>     | Spectacled Monarch                   |                                |                           |                               |
| <i>Tregellasia capito</i>            | Pale-yellow Robin                    |                                |                           |                               |
| <i>Trichoglossus chlorolepidotus</i> | Scaly-breasted Lorikeet              |                                |                           |                               |
| <i>Trichoglossus haematodus</i>      | Rainbow Lorikeet                     |                                |                           |                               |
| <i>Turnix melanogaster</i>           | Black-breasted Button-quail          | V                              | E                         | V                             |
| <i>Tyto tenebricosa</i>              | Sooty Owl                            |                                | V                         | R                             |
| <i>Urodynamis taitensis</i>          | Long-tailed Cuckoo, Long-tailed Koel |                                |                           |                               |
| <i>Zoothera lunulata</i>             | Bassian Thrush                       |                                |                           |                               |
| <i>Zosterops lateralis</i>           | Silvereye                            |                                |                           |                               |

| Appendix C Fauna                           |                        | C'wealth<br>(EPBC Act) | NSW<br>(TSC Act*) | QLD<br>(NCA<br>1992) |
|--------------------------------------------|------------------------|------------------------|-------------------|----------------------|
| <b>Mammals</b>                             |                        |                        |                   |                      |
| <i>Antechinus subtropicus</i>              | Subtropical Antechinus |                        |                   |                      |
| <i>Chalinolobus dwyeri</i>                 | Large-eared Pied Bat   | V                      | V                 | R                    |
| <i>Chalinolobus morio</i>                  | Chocolate-wattled Bat  |                        |                   |                      |
| <i>Dasyurus maculatus maculatus</i>        | Spotted-tailed Quoll   | E                      | V                 | V                    |
| <i>Kerivoula papuensis</i>                 | Golden-tipped Bat      |                        | V                 | R                    |
| <i>Macropus dorsalis</i>                   | Black-striped Wallaby  |                        | E                 |                      |
| <i>Melomys cervinipes</i>                  | Fawn-footed Melomys    |                        |                   |                      |
| <i>Miniopterus australis</i>               | Little Bentwing-bat    |                        | V                 |                      |
| <i>Miniopterus schreibersii oceanensis</i> | Eastern Bentwing-bat   |                        | V                 |                      |
| <i>Nyctimene robinsoni</i>                 | Eastern Tube-nosed Bat |                        | V                 |                      |
| <i>Nyctophilus bifax</i>                   | Eastern Long-eared Bat |                        | V                 |                      |
| <i>Pseudocheirus peregrinus</i>            | Common Ringtail Possum |                        |                   |                      |
| <i>Pteropus alecto</i>                     | Black Flying-fox       |                        | V                 |                      |
| <i>Pteropus poliocephalus</i>              | Grey-headed Flying-fox | V                      | V                 |                      |
| <i>Rhinolophus megaphyllus</i>             | Eastern Horseshoe Bat  |                        |                   |                      |
| <i>Syconycteris australis</i>              | Eastern Blossom-bat    |                        | V                 |                      |
| <i>Thylogale stigmatica</i>                | Red-legged Pademelon   |                        | V                 |                      |
| <i>Thylogale thetis</i>                    | Red-necked Pademelon   |                        |                   |                      |

| <b>Appendix C Fauna<br/>Reptiles and Amphibians</b> |                                                           | <b>C'wealth<br/>(EPBC Act)</b> | <b>NSW<br/>(TSC Act*)</b> | <b>QLD<br/>(NCA<br/>1992)</b> |
|-----------------------------------------------------|-----------------------------------------------------------|--------------------------------|---------------------------|-------------------------------|
| <i>Assa darlingtoni</i>                             | Pouched Frog                                              |                                | V                         | R                             |
| <i>Cacophis krefftii</i>                            | Dwarf Crowned Snake                                       |                                |                           |                               |
| <i>Coeranoscincus reticulatus</i>                   | Three-toed Snake-tooth Skink                              | V                              | V                         | R                             |
| <i>Bellatorias major</i>                            | Land Mullet                                               |                                |                           |                               |
| <i>Gonocephalus spinipes</i>                        | Southern Angle-headed Dragon                              |                                |                           |                               |
| <i>Hoplocephalus stephensii</i>                     | Stephens' Banded Snake                                    |                                | V                         | R                             |
| <i>Hypsilurus spinipes</i>                          | Southern Forest Dragon                                    |                                |                           |                               |
| <i>Lechriodus fletcheri</i>                         | Fletcher's Frog                                           |                                |                           | R                             |
| <i>Litoria chloris</i>                              | Red-eyed Tree-frog                                        |                                |                           |                               |
| <i>Litoria pearsoniana</i>                          | Pearson's Green Tree Frog                                 |                                |                           | E                             |
| <i>Litoria phyllochroa</i>                          | Leaf-green Tree-frog                                      |                                |                           |                               |
| <i>Litoria revelata</i>                             | Whirring Tree Frog                                        |                                |                           | R                             |
| <i>Mixophyes balbus</i>                             | Stuttering Frog                                           |                                |                           |                               |
| <i>Mixophyes fleayi</i>                             | Fleay's Barred Frog                                       | E                              | E                         | E                             |
| <i>Mixophyes iteratus</i>                           | Giant Barred Frog                                         | E                              | E                         | E                             |
| <i>Ophioscincus truncatus</i>                       | Short-limbed Snake-skink,<br>Yellow-bellied Legless-skink |                                |                           | R                             |
| <i>Philoria loveridgei</i>                          | Loveridge's Frog                                          |                                | E                         | R                             |
| <i>Posargus ocellatus</i>                           | Marbled Frogmouth                                         |                                |                           |                               |
| <i>Saltuarius swainii</i>                           | Southern Leaf-tailed Gecko                                |                                |                           |                               |
| <i>Saproscincus challengerii</i>                    | Orange-tailed Shadeskink                                  |                                |                           |                               |
| <i>Saproscincus rosei</i>                           | Rose's Shadeskink,<br>Orange-tailed Shadeskink            |                                |                           | R                             |
| <i>Saproscincus spectabilis</i>                     | Spectacled Shadeskink                                     |                                |                           | R                             |
|                                                     |                                                           |                                |                           |                               |
| <b>Appendix C Fauna<br/>Invertebrates</b>           |                                                           | <b>C'wealth<br/>(EPBC Act)</b> | <b>NSW<br/>(TSC Act*)</b> | <b>QLD<br/>(NCA<br/>1992)</b> |
| <i>Nurus atlas</i>                                  | Atlas Rainforest Ground-beetle                            |                                | E                         |                               |
| <i>Nurus brevis</i>                                 | Shorter Rainforest Ground-beetle                          |                                | E                         |                               |
| <i>Troides richmondia</i>                           | Richmond Birdwing Butterfly                               |                                |                           | V                             |
| <i>Phyllodes imperialis</i> southern<br>subspecies  | Pink Underwing Moth                                       | E                              | E                         |                               |
| <i>Thersites mitchellae</i>                         | Mitchell's Rainforest Snail                               | CE                             | E                         |                               |

| Appendix D Threatened Species                                                                             | Common Name                              | C'wealth<br>(EPBC<br>Act) | NSW<br>(TSC<br>Act*) | QLD<br>(NCA<br>1992) |
|-----------------------------------------------------------------------------------------------------------|------------------------------------------|---------------------------|----------------------|----------------------|
| <b>Scientific Name</b>                                                                                    |                                          |                           |                      |                      |
| <b>FLORA SPECIES</b>                                                                                      |                                          |                           |                      |                      |
| <i>Acacia bakeri</i>                                                                                      | Marblewood                               |                           | V                    |                      |
| <i>Acalypha eremorum</i>                                                                                  | Acalypha                                 |                           | E                    |                      |
| <i>Acronychia baeuerlenii</i>                                                                             | Byron Bay Acronychia                     |                           |                      | NT                   |
| <i>Amyema plicatula</i> [syn. <i>Amyema scandens</i> ]                                                    |                                          | E                         | E                    |                      |
| <i>Archidendron hendersonii</i>                                                                           | White Laceflower                         |                           | V                    |                      |
| <i>Archidendron muellerianum</i>                                                                          | Veiny Laceflower                         |                           |                      | NT                   |
| <i>Ardisia bakeri</i>                                                                                     | Ardisia bakeri                           |                           |                      | NT                   |
| <i>Arthraxon hispidus</i>                                                                                 | Hairy Jointgrass                         | V                         | V                    | V                    |
| <i>Baloghia marmorata</i>                                                                                 | Jointed Baloghia                         | V                         | V                    | V                    |
| <i>Belvisia mucronata</i>                                                                                 | Needle-leaf Fern                         |                           | E                    |                      |
| <i>Bosistoa transversa</i>                                                                                | Yellow Satinheart, Heart-leaved Bonewood | V                         | V                    |                      |
| <i>Cassia marksiana</i> [syn. <i>C. brewsteri</i> var. <i>marksiana</i> ]                                 | Brush Cassia                             |                           | E                    | V                    |
| <i>Choricarpia subargentea</i>                                                                            | Giant Ironwood                           |                           | E                    | NT                   |
| <i>Clematis fawcettii</i>                                                                                 | Northern Clematis                        | V                         | V                    | V                    |
| <i>Coatesia paniculata</i> [syn. <i>Geijera paniculata</i> ]                                              | Axe-breaker                              |                           | E                    |                      |
| <i>Corynocarpus rupestris</i> subsp. <i>arborescens</i>                                                   | Southern Corynocarpus                    |                           |                      | V                    |
| <i>Cryptocarya foetida</i>                                                                                | Stinking Cryptocarya                     | V                         | V                    | V                    |
| <i>Cupaniopsis newmanii</i>                                                                               | Long-leaved tuckeroo                     |                           |                      | NT                   |
| <i>Davidsonia jerseyana</i>                                                                               | Davidson's Plum                          | E                         | E                    |                      |
| <i>Davidsonia johnsonii</i>                                                                               | Smooth Davidson's Plum                   | E                         | E                    | E                    |
| <i>Dendrocnide moroides</i>                                                                               | Gympie Stinger                           |                           | E                    |                      |
| <i>Desmodium acanthocladum</i>                                                                            | Thorny Pea                               | V                         | V                    |                      |
| <i>Diospyros mabacea</i>                                                                                  | Red-fruited Ebony                        | E                         | E                    |                      |
| <i>Diospyros major</i> var. <i>ebenus</i> [syn. <i>Diospyros ellipticifolia</i> f. <i>australiensis</i> ] | Shiny-leaved Ebony                       |                           | E                    |                      |
| <i>Diploglottis campbellii</i>                                                                            | Small-leaved Tamarind                    | E                         | E                    | E                    |
| <i>Elaeocarpus sedentarius</i>                                                                            | Minyon Quandong                          | E                         | E                    |                      |
| <i>Elaeocarpus williamsianus</i>                                                                          | Hairy Quandong                           | E                         | E                    |                      |
| <i>Endiandra floydii</i>                                                                                  | Crystal Creek Walnut                     | E                         | E                    | E                    |
| <i>Endiandra hayesii</i>                                                                                  | Rusty Rose Walnut                        | V                         | V                    | V                    |
| <i>Endiandra muelleri</i> subsp. <i>bracteata</i>                                                         |                                          |                           | E                    |                      |
| <i>Floydia praealta</i>                                                                                   | Ball Nut                                 | V                         | V                    | V                    |
| <i>Fontainea australis</i>                                                                                | Southern Fontainea                       | V                         | V                    | V                    |
| <i>Fontainea oraria</i>                                                                                   | Coastal Fontainea                        | E                         | E                    |                      |
| <i>Gossia fragrantissima</i>                                                                              | Sweet Myrtle                             | E                         | E                    | E                    |
| <i>Grevillea hilliana</i>                                                                                 | White Yiel Yiel                          |                           | E                    |                      |
| <i>Helmholtzia glaberrima</i>                                                                             |                                          |                           |                      | NT                   |
| <i>Hicksbeachia pinnatifolia</i>                                                                          | Red Boppel Nut                           | V                         | V                    | V                    |
| <i>Isoglossa eranthemoides</i>                                                                            | Isoglossa                                | E                         | E                    |                      |
| <i>Lenwebbia prominens</i>                                                                                | Velvet Myrtle                            |                           |                      | NT                   |
| <i>Lepiderema pulchella</i>                                                                               | Fine-leaved Tuckeroo                     |                           | V                    | V                    |
| <i>Lindaea brachypoda</i>                                                                                 |                                          |                           | V                    |                      |
| <i>Macadamia integrifolia</i>                                                                             | Macadamia Nut                            | V                         |                      | V                    |
| <i>Macadamia tetraphylla</i>                                                                              | Rough-shelled Bush Nut                   | V                         | V                    | V                    |
|                                                                                                           |                                          |                           |                      |                      |

| Appendix D Threatened Species                                                                              | Common Name              | C'wealth<br>(EPBC<br>Act) | NSW<br>(TSC<br>Act*) | QLD<br>(NCA<br>1992) |
|------------------------------------------------------------------------------------------------------------|--------------------------|---------------------------|----------------------|----------------------|
| <b>Scientific Name</b>                                                                                     |                          |                           |                      |                      |
| <b>FLORA SPECIES</b>                                                                                       |                          |                           |                      |                      |
| <i>Marsdenia longiloba</i>                                                                                 | Slender Marsdenia        | V                         | E                    | V                    |
| <i>Myrsine richmondensis</i> [syn. <i>Rapanea</i> sp. Richmond River (J.H.Maiden & J.L.Boorman NSW 26751)] | Ripple-leaf Muttonwood   | E                         | E                    |                      |
| <i>Niemeyera chartacea</i>                                                                                 |                          |                           | E                    |                      |
| <i>Niemeyera whitei</i> [syn. <i>Amorphospermum whitei</i> ]                                               | Rusty Plum               |                           | V                    | V                    |
| <i>Ochrosia moorei</i>                                                                                     | Southern Ochrosia        | E                         | E                    | E                    |
| <i>Owenia cepiodora</i>                                                                                    | Onion Cedar              | V                         | V                    | V                    |
| <i>Pararistolochia praevenosa</i>                                                                          |                          |                           |                      | NT                   |
| <i>Peristeranthus hillii</i>                                                                               | Brown Fairy-chain Orchid |                           | V                    |                      |
| <i>Phyllanthus microcladus</i>                                                                             | Brush Sauropus           |                           | E                    |                      |
| <i>Randia moorei</i>                                                                                       | Spiny Gardenia           | E                         | E                    | E                    |
| <i>Senna acclinis</i>                                                                                      | Rainforest Cassia        |                           | E                    | NT                   |
| <i>Sophora fraseri</i>                                                                                     | Brush Sophora            | V                         | V                    | V                    |
| <i>Syzygium hodgkinsoniae</i>                                                                              | Red Lilly Pilly          | V                         | V                    | V                    |
| <i>Syzygium moorei</i>                                                                                     | Durobby                  | V                         | V                    | V                    |
| <i>Tinospora tinosporoides</i>                                                                             | Arrow-head Vine          | V                         | V                    | V                    |
| <i>Triflorensia cameronii</i> [syn. <i>Tarenna cameronii</i> ]                                             | Cameron's Tarenna        |                           | E                    |                      |
| <i>Xylosma terrae-reginae</i>                                                                              |                          |                           | V                    |                      |
| <i>Zieria collina</i>                                                                                      |                          | V                         |                      | V                    |
|                                                                                                            |                          |                           |                      |                      |
| <b>Number of species</b>                                                                                   |                          | <b>33</b>                 | <b>51</b>            | <b>36</b>            |
|                                                                                                            |                          |                           |                      |                      |

| Appendix D Threatened Species                                    | Common Name                                | C'wealth<br>(EPBC<br>Act) | NSW<br>(TSC<br>Act*) | QLD<br>(NCA<br>1992) |
|------------------------------------------------------------------|--------------------------------------------|---------------------------|----------------------|----------------------|
| <b>Scientific Name</b>                                           |                                            |                           |                      |                      |
| <b>FAUNA SPECIES</b>                                             |                                            |                           |                      |                      |
| <i>Accipiter novaehollandiae</i>                                 | Grey Goshawk                               |                           |                      | R                    |
| <i>Assa darlingtoni</i>                                          | Pouched Frog                               |                           | V                    | R                    |
| <i>Carterornis leucotis</i>                                      | White-eared Monarch                        |                           | V                    |                      |
| <i>Chalinolobus dwyeri</i>                                       | Large-eared Pied Bat                       | V                         | V                    | R                    |
| <i>Coeranoscincus reticulatus</i>                                | Three-toed Snake-tooth Skink               | V                         | V                    | R                    |
| <i>Coracina lineata</i>                                          | Barred Cuckoo-shrike                       |                           | V                    |                      |
| <i>Cyclopsitta diophthalma coxeni</i>                            | Coxen's Fig-parrot, Double-eyed Fig-parrot | E                         | E                    | E                    |
| <i>Dasyurus maculatus maculatus</i>                              | Spotted-tailed Quoll                       | E                         | V                    | V                    |
| <i>Erythroriorchis radiatus</i>                                  | Red Goshawk                                | V                         | E                    | E                    |
| <i>Hoplocephalus stephensii</i>                                  | Stephens' Banded Snake                     |                           | V                    | R                    |
| <i>Kerivoula papuensis</i>                                       | Golden-tipped Bat                          |                           | V                    | R                    |
| <i>Lechriodus fletcheri</i>                                      | Fletcher's Frog                            |                           |                      | R                    |
| <i>Litoria pearsoniana</i>                                       | Pearson's Green Tree Frog                  |                           |                      | E                    |
| <i>Litoria revelata</i>                                          | Whirring Tree Frog                         |                           |                      | R                    |
| <i>Macropus dorsalis</i>                                         | Black-striped Wallaby                      |                           | E                    |                      |
| <i>Menura alberti</i>                                            | Albert's Lyrebird                          |                           | V                    | R                    |
| <i>Miniopterus australis</i>                                     | Little Bentwing-bat                        |                           | V                    |                      |
| <i>Miniopterus schreibersii oceanensis</i>                       | Eastern Bentwing-bat                       |                           | V                    |                      |
| <i>Mixophyes fleayi</i>                                          | Fleay's Barred Frog                        | E                         | E                    | E                    |
| <i>Mixophyes iteratus</i>                                        | Giant Barred Frog                          | E                         | E                    | E                    |
| <i>Nurus atlas</i>                                               | Atlas Rainforest Ground-beetle             |                           | E                    |                      |
| <i>Nurus brevis</i>                                              | Shorter Rainforest Ground-beetle           |                           | E                    |                      |
| <i>Nyctimene robinsoni</i>                                       | Eastern Tube-nosed Bat                     |                           | V                    |                      |
| <i>Nyctophilus bifax</i>                                         | Eastern Long-eared Bat                     |                           | V                    |                      |
| <i>Ophioscincus truncatus</i>                                    | Short-limbed Snake-skink                   |                           |                      | R                    |
| <i>Philoria loveridgei</i>                                       | Loveridge's Frog                           |                           | E                    | R                    |
| <i>Phyllodes imperialis southern subspecies</i>                  | Pink Underwing Moth                        | E                         | E                    |                      |
| <i>Podargus ocellatus plumiferus</i>                             | Marbled Frogmouth                          |                           | V                    | V                    |
| <i>Potorous tridactylus tridactylus</i>                          | Long-nosed Potoroo                         | V                         | V                    | V                    |
| <i>Pteropus alecto</i>                                           | Black Flying-fox                           |                           | V                    |                      |
| <i>Pteropus poliocephalus</i>                                    | Grey-headed Flying-fox                     | V                         | V                    |                      |
| <i>Ptilinopus magnificus</i>                                     | Wompoo Fruit-Dove                          |                           | V                    |                      |
| <i>Ptilinopus regina</i>                                         | Rose-crowned Fruit-Dove                    |                           | V                    |                      |
| <i>Ptilinopus superbus</i>                                       | Superb Fruit-Dove                          |                           | V                    |                      |
| <i>Saproscincus rosei</i>                                        | Orange-tailed Shadeskink                   |                           |                      | R                    |
| <i>Saproscincus spectabilis</i>                                  | Spectacled Shade-skink                     |                           |                      | R                    |
| <i>Syconycteris australis</i>                                    | Eastern Blossom-bat                        |                           | V                    |                      |
| <i>Thersites mitchellae</i>                                      | Mitchell's Rainforest Snail                | CE                        | E                    |                      |
| <i>Thylogale stigmatica</i>                                      | Red-legged Pademelon                       |                           | V                    |                      |
| <i>Troides richmondia</i> [syn. <i>Ornithoptera richmondia</i> ] | Richmond Birdwing Butterfly                |                           |                      | V                    |
| <i>Turnix melanogaster</i>                                       | Black-breasted Button-quail                | V                         | E                    | V                    |
| <i>Tyto tenebricosa</i>                                          | Sooty Owl                                  |                           | V                    | R                    |
|                                                                  |                                            |                           |                      |                      |
| <b>Number of species</b>                                         |                                            | <b>12</b>                 | <b>34</b>            | <b>24</b>            |

# Attachment 2 Relevant EPBC Act Conditions of Approval (EPBC 2015/7464)

## *Lowland rainforest of subtropical Australia threatened ecological community management*

2. For the protection of the **EPBC Act** listed critically endangered **Lowland rainforest of subtropical Australia** the **approval holder** must:

b. **legally secure** and implement the offset of 16.64ha at the location shown in Attachment B, and ensure by the tenth anniversary of **commencement of the action**, the offset meets the following condition thresholds:

- i. Canopy Cover: at least 70 per cent canopy vegetation is native;
- ii. Species Richness: contains 30 native woody species from the **Lowland rainforest of subtropical Australia threatened ecological community listing advice**; and
- ii. Total vegetation: at least 70 per cent of the total vegetation cover is native.

## *Administrative conditions*

5. The **approval holder** must maintain accurate records substantiating all activities associated with or relevant to the conditions of approval and make them available upon request to the **Department**. Such records may be subject to audit by the **Department** or an independent auditor in accordance with Section 458 of the **EPBC Act**, or used to verify compliance with the conditions of approval. Summaries of audits will be posted on the **Department's** website. The results of audits must also be published on the **approval holder's** website within two weeks of the **Department's** approval of the final audit.

6. Within three months of every 12 month anniversary of the **commencement of the action**, the **approval holder** must publish a report on their website addressing compliance with each of the conditions of this approval over the previous 12 months. Documentary evidence providing proof of the date of publication and non-compliance with any of the conditions of this approval must be provided to the **Department** at the same time as the compliance report is published.

7. Upon the direction of the **Minister**, the person taking the action must ensure that an independent audit of compliance with the conditions of approval is conducted and a report submitted to the **Minister**. The independent auditor must be approved by the **Minister** prior to the commencement of the audit. Audit criteria must be agreed to by the **Minister** and the audit report must address the criteria to the satisfaction of the **Minister**.

## *Definitions*

**Approval holder** means the person to who the approval is granted, or any person acting on their behalf, or to whom the approval is transferred under section 145B of the EPBC Act.

**Commencement of action** means disturbance of any vegetation identified as **Lowland rainforest of subtropical Australia** or **koala habitat**, as defined in this approval notice.

**Department** means the Australian Government Department administering the *Environment Protection and Biodiversity Conservation Act 1999*.

**EPBC Act** means the *Environment Protection and Biodiversity Conservation Act 1999*.

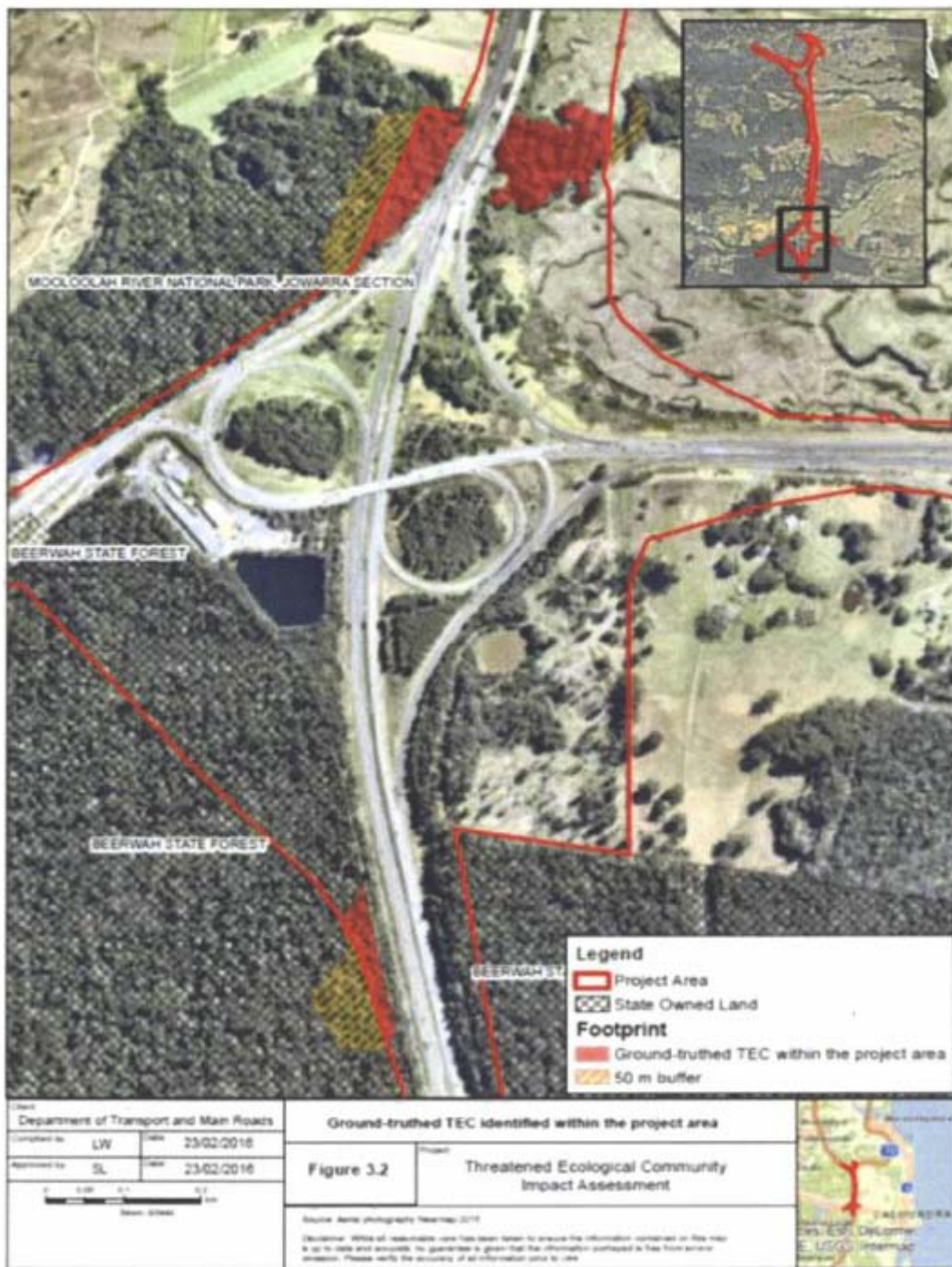
**Legally secure** means placing on the land title a voluntary declaration under the *Vegetation Management Act 1999* (Qld).

**Lowland rainforest of subtropical Australia** means the areas identified as 'ground-truthed TEC within the project area' and '50m buffer' in Attachment A.

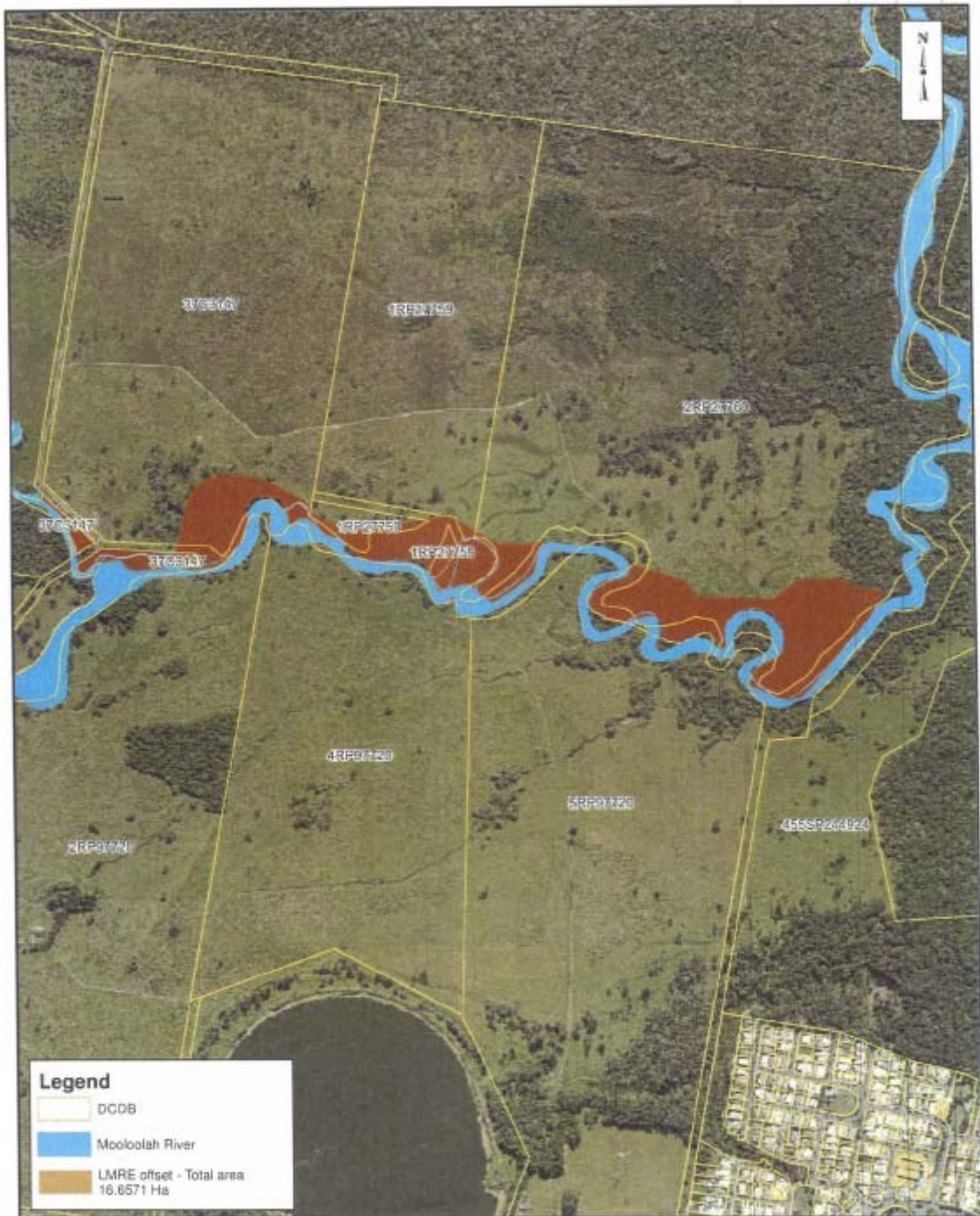
**Lowland rainforest of subtropical Australia threatened ecological community listing advice** means Appendix A of the TSSC (2011a) Commonwealth Listing Advice on Lowland Rainforest of Subtropical Australia  
<http://www.environment.gov.au/biodiversity/threatened/communities/pubs/101-listing-advice.pdf>

**Minister** means the Commonwealth **Minister** administering the **EPBC Act** and includes a delegate of the **Minister**.

Attachment A



Attachment B.



|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                |                                                                                                                                              |                                                                                                                        |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|
| <p>Prepared by: Map (State of Australia (MDR) Zone 56, Geocentric Datum of Australia (GDA))</p> <p>Date: 1994</p> <p>© The State of Queensland, 2011. © Pricer, Brown Software Pty Ltd, 2011</p> <p>Disclaimer: While every effort is taken to ensure the accuracy of this data, Pricer, Brown Software Pty Ltd and the State of Queensland do not warrant or represent the accuracy of this data. The accuracy of this data is not guaranteed for any purpose and shall be at the user's discretion. The user shall be responsible for any loss or damage arising from the use of this data. The user shall be responsible for any loss or damage arising from the use of this data.</p> | <p><b>Mooloolah River<br/>Lower Mooloolah River Environment<br/>Reserve (LMRE Reserve)</b></p> | <p>Map No: <b>Map1</b></p> <p>Scale: <b>A</b> Date: <b>13/03/2017</b></p> <p>Drawn by: <b>R Friend</b></p> <p>Checked by: <b>S Scott</b></p> |  <p>Queensland<br/>Government</p> |
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# **Attachment 3 LMRE Reserve Offset Assessment Guide**

Offsets Assessment Guide

For use in determining offsets under the *Environment Protection and Biodiversity Conservation Act 1999*  
2 October 2012

This guide relies on Macros being enabled in your browser.

| Matter of National Environmental Significance                                         |                       |
|---------------------------------------------------------------------------------------|-----------------------|
| Name                                                                                  | LSRA                  |
| EPBC Act status                                                                       | Critically Endangered |
| Annual probability of extinction<br><small>Based on IUCN category definitions</small> | 6.8 %                 |

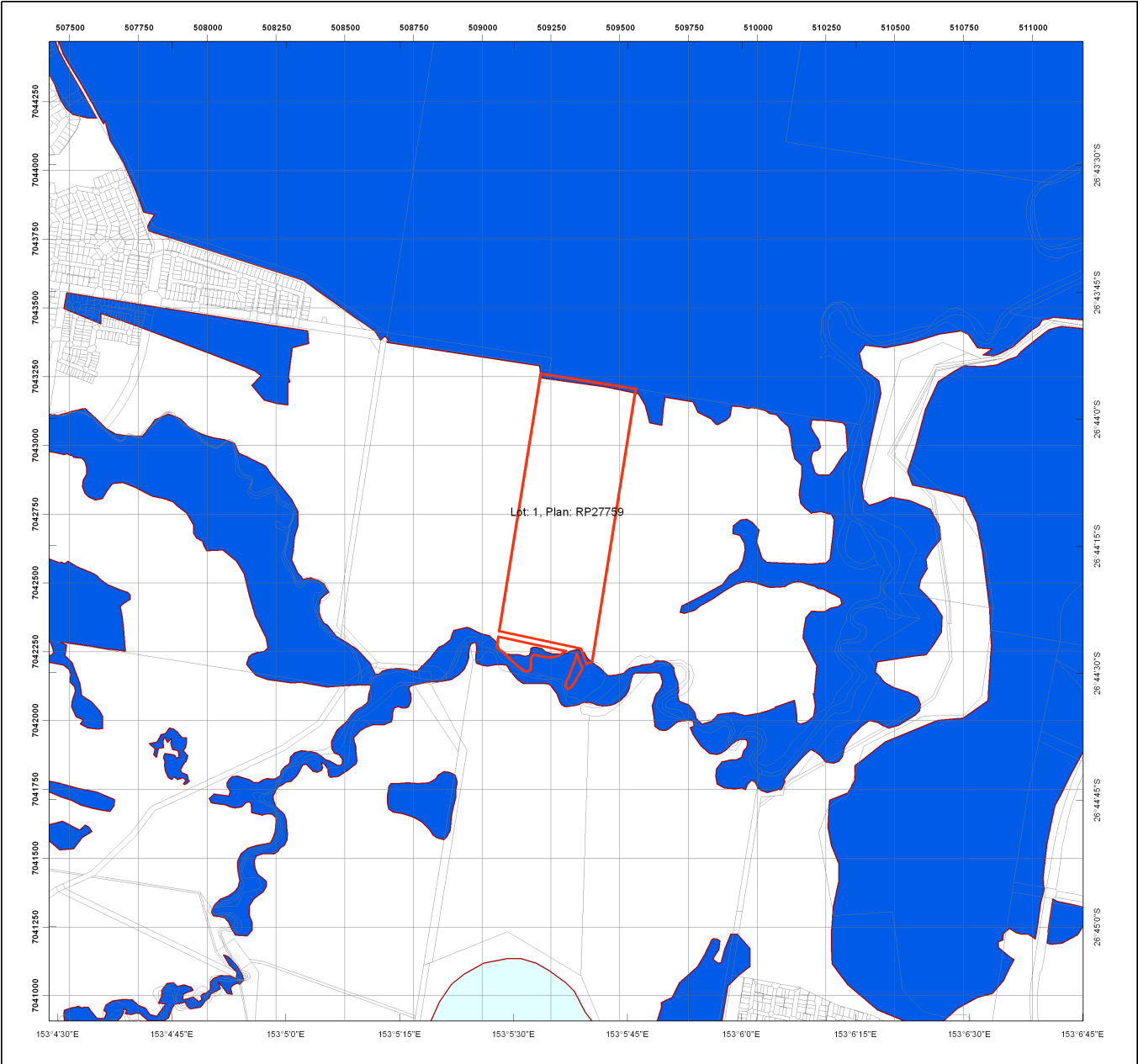
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|-----------------------------|
| User input required         |
| Drop-down list              |
| Calculated output           |
| Not applicable to attribute |

| Impact calculator |                                                                              |                             |                |                         |      |                   |                    |
|-------------------|------------------------------------------------------------------------------|-----------------------------|----------------|-------------------------|------|-------------------|--------------------|
| Impact calculator | Protected matter attributes                                                  | Attribute relevant to case? | Description    | Quantum of impact       |      | Units             | Information source |
|                   | Ecological communities                                                       |                             |                |                         |      |                   |                    |
|                   | Area of community                                                            | Yes                         | 3.92ha removal | Area                    | 3.92 | Hectares          | PD documentation   |
|                   |                                                                              |                             |                | Quality                 | 7    | Scale 0-10        |                    |
|                   |                                                                              |                             |                | Total quantum of impact | 2.74 | Adjusted hectares |                    |
|                   | Threatened species habitat                                                   |                             |                |                         |      |                   |                    |
|                   | Area of habitat                                                              | No                          |                | Area                    |      |                   |                    |
|                   |                                                                              |                             |                | Quality                 |      |                   |                    |
|                   |                                                                              |                             |                | Total quantum of impact | 0.00 |                   |                    |
|                   | Protected matter attributes                                                  | Attribute relevant to case? | Description    | Quantum of impact       |      | Units             | Information source |
|                   | Number of features<br>e.g. Nest hollows, habitat trees                       | No                          |                |                         |      |                   |                    |
|                   | Condition of habitat<br>Change in habitat condition, but no change in extent | No                          |                |                         |      |                   |                    |
|                   | Threatened species                                                           |                             |                |                         |      |                   |                    |
|                   | Birth rate<br>e.g. Change in nest success                                    | No                          |                |                         |      |                   |                    |
|                   | Mortality rate<br>e.g. Change in number of road kills per year               | No                          |                |                         |      |                   |                    |
|                   | Number of individuals<br>e.g. Individual plants/animals                      | No                          |                |                         |      |                   |                    |

| Offset calculator                                             |                                                                              |                             |                         |                   |                         |                                                 |      |                                             |       |                                               |    |                                            |    |          |                            |               |                                       |      |                    |                                               |                  |                    |
|---------------------------------------------------------------|------------------------------------------------------------------------------|-----------------------------|-------------------------|-------------------|-------------------------|-------------------------------------------------|------|---------------------------------------------|-------|-----------------------------------------------|----|--------------------------------------------|----|----------|----------------------------|---------------|---------------------------------------|------|--------------------|-----------------------------------------------|------------------|--------------------|
| Offset calculator                                             | Protected matter attributes                                                  | Attribute relevant to case? | Total quantum of impact | Units             | Proposed offset         | Time horizon (years)                            |      | Start area and quality                      |       | Future area and quality without offset        |    | Future area and quality with offset        |    | Raw gain | Confidence in result ( % ) | Adjusted gain | Net present value (adjusted hectares) |      | % of impact offset | Minimum (90% ) direct offset requirement met? | Cost ( \$ total) | Information source |
|                                                               | Ecological Communities                                                       |                             |                         |                   |                         |                                                 |      |                                             |       |                                               |    |                                            |    |          |                            |               |                                       |      |                    |                                               |                  |                    |
|                                                               | Area of community                                                            | Yes                         | 2.74                    | Adjusted hectares | LMRE Remnant vegetation | Risk-related time horizon (max. 20 years)       | 20   | Start area (hectares)                       | 16.64 | Risk of loss ( % ) without offset             | 5% | Risk of loss ( % ) with offset             | 1% | 0.67     | 90%                        | 0.60          | 0.16                                  | 2.45 | 89.14%             | No                                            |                  |                    |
|                                                               |                                                                              |                             |                         |                   |                         | Future area without offset (adjusted hectares)  | 15.8 | Future area with offset (adjusted hectares) | 16.5  |                                               |    |                                            |    |          |                            |               |                                       |      |                    |                                               |                  |                    |
|                                                               |                                                                              |                             |                         |                   |                         | Time until ecological benefit                   | 10   | Start quality (scale of 0-10)               | 5     | Future quality without offset (scale of 0-10) | 4  | Future quality with offset (scale of 0-10) | 7  | 3.00     | 95%                        | 2.85          | 1.48                                  |      |                    |                                               |                  |                    |
|                                                               | Threatened species habitat                                                   |                             |                         |                   |                         |                                                 |      |                                             |       |                                               |    |                                            |    |          |                            |               |                                       |      |                    |                                               |                  |                    |
|                                                               | Area of habitat                                                              | No                          |                         |                   |                         | Time over which loss is averted (max. 20 years) |      | Start area (hectares)                       |       | Risk of loss ( % ) without offset             |    | Risk of loss ( % ) with offset             |    |          |                            |               |                                       |      |                    |                                               |                  |                    |
|                                                               |                                                                              |                             |                         |                   |                         | Future area without offset (adjusted hectares)  | 0.0  | Future area with offset (adjusted hectares) | 0.0   |                                               |    |                                            |    |          |                            |               |                                       |      |                    |                                               |                  |                    |
|                                                               |                                                                              |                             |                         |                   |                         | Time until ecological benefit                   |      | Start quality (scale of 0-10)               |       | Future quality without offset (scale of 0-10) |    | Future quality with offset (scale of 0-10) |    |          |                            |               |                                       |      |                    |                                               |                  |                    |
|                                                               | Protected matter attributes                                                  | Attribute relevant to case? | Total quantum of impact | Units             | Proposed offset         | Time horizon (years)                            |      | Start value                                 |       | Future value without offset                   |    | Future value with offset                   |    | Raw gain | Confidence in result ( % ) | Adjusted gain | Net present value                     |      | % of impact offset | Minimum (90% ) direct offset requirement met? | Cost ( \$ total) | Information source |
|                                                               | Number of features<br>e.g. Nest hollows, habitat trees                       | No                          |                         |                   |                         |                                                 |      |                                             |       |                                               |    |                                            |    |          |                            |               |                                       |      |                    |                                               |                  |                    |
|                                                               | Condition of habitat<br>Change in habitat condition, but no change in extent | No                          |                         |                   |                         |                                                 |      |                                             |       |                                               |    |                                            |    |          |                            |               |                                       |      |                    |                                               |                  |                    |
|                                                               | Threatened species                                                           |                             |                         |                   |                         |                                                 |      |                                             |       |                                               |    |                                            |    |          |                            |               |                                       |      |                    |                                               |                  |                    |
|                                                               | Birth rate<br>e.g. Change in nest success                                    | No                          |                         |                   |                         |                                                 |      |                                             |       |                                               |    |                                            |    |          |                            |               |                                       |      |                    |                                               |                  |                    |
| Mortality rate<br>e.g Change in number of road kills per year | No                                                                           |                             |                         |                   |                         |                                                 |      |                                             |       |                                               |    |                                            |    |          |                            |               |                                       |      |                    |                                               |                  |                    |
| Number of individuals<br>e.g. Individual plants/animals       | No                                                                           |                             |                         |                   |                         |                                                 |      |                                             |       |                                               |    |                                            |    |          |                            |               |                                       |      |                    |                                               |                  |                    |

| Summary |                             |                   |                             |                    |                         |                    |                                  |
|---------|-----------------------------|-------------------|-----------------------------|--------------------|-------------------------|--------------------|----------------------------------|
| Summary | Protected matter attributes | Quantum of impact | Net present value of offset | % of impact offset | Direct offset adequate? | Cost (\$)          |                                  |
|         |                             |                   |                             |                    |                         | Direct offset (\$) | Other compensatory measures (\$) |
|         | Birth rate                  | 0                 |                             |                    |                         | \$0.00             | \$0.00                           |
|         | Mortality rate              | 0                 |                             |                    |                         | \$0.00             | \$0.00                           |
|         | Number of individuals       | 0                 |                             |                    |                         | \$0.00             | \$0.00                           |
|         | Number of features          | 0                 |                             |                    |                         | \$0.00             | \$0.00                           |
|         | Condition of habitat        | 0                 |                             |                    |                         | \$0.00             | \$0.00                           |
|         | Area of habitat             | 0                 |                             |                    |                         | \$0.00             | \$0.00                           |
|         | Area of community           | 2.744             | 2.45                        | 89.14%             | No                      | \$0.00             | #DIV/0!                          |
|         |                             |                   |                             |                    |                         | \$0.00             | #DIV/0!                          |

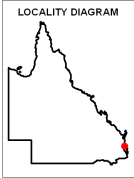
## **Attachment 4 Regulated Vegetation Management Map**



Regulated Vegetation Management Map

Legend

- Lot and Plan
- Category A area (Vegetation offsets/compliance notices/VDecs)
- Category B area (Remnant vegetation)
- Category C area (High-value regrowth vegetation)
- Category R area (Reef regrowth watercourse vegetation)
- Category X area (Vegetation not regulated under the VMA)
- Water
- Area not categorised
- Cadastral line
- Property boundaries shown are provided as a locational aid only



Disclaimer:  
While every care is taken to ensure the accuracy of this product, the Department of Natural Resources and Mines makes no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and disclaims all responsibility and all liability (including without limitation, liability in negligence) for all expenses, losses, damages (including indirect or consequential damage) and costs which you might incur as a result of the product being inaccurate or incomplete in any way and for any reason.

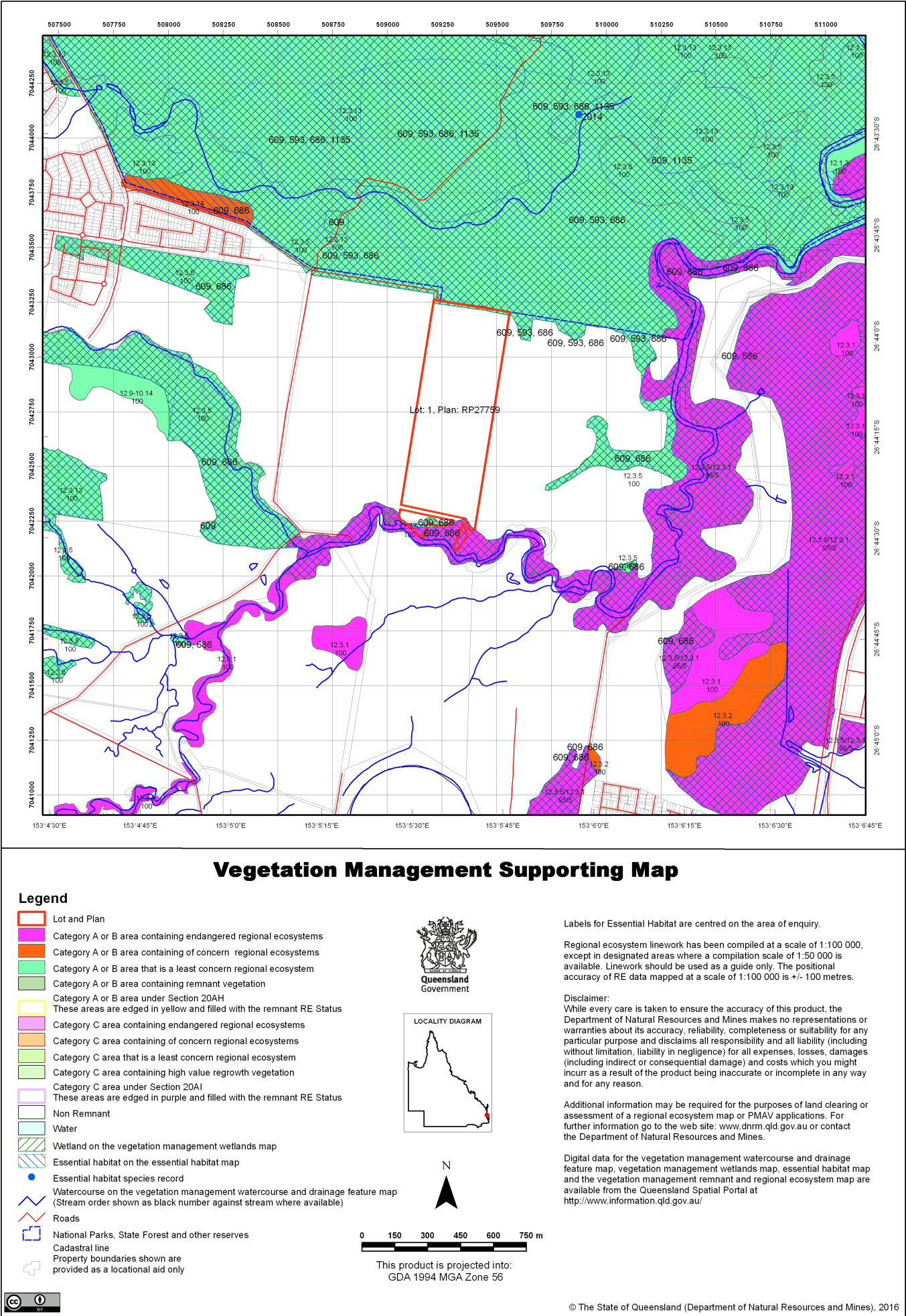
Additional information required for the assessment of vegetation values is provided in the accompanying "Vegetation Management Supporting map". For further information go to the web site: [www.dnrm.qld.gov.au](http://www.dnrm.qld.gov.au) or contact the Department of Natural Resources and Mines.

Digital data for the regulated vegetation management map is available from the Queensland Spatial Portal at <http://www.information.qld.gov.au/>

This map is updated on a monthly basis to ensure new PMAVs are included as they are approved.



This product is projected into:  
GDA 1994 MGA Zone 56



Vegetation Management Act 1999 - Extract from the essential habitat database

Essential habitat is required for assessment under the:

- State Development Assessment Provisions - Module 8: Native vegetation clearing which sets out the matters of interest to the state for development assessment under the *Sustainable Planning Act 2009*; and
- Self-assessable vegetation clearing codes made under the *Vegetation Management Act 1999*

Essential habitat for one or more of the following species is found on and within 1.1 km of the identified subject lot/s or on and within 2.2 km of an identified coordinate on the accompanying essential habitat map.

This report identifies essential habitat in Category A, B and Category C areas.

The numeric labels on the essential habitat map can be cross referenced with the database below to determine which essential habitat factors might exist for a particular species.

Essential habitat is compiled from a combination of species habitat models and buffered species records.

The Department of Natural Resources and Mines website (<http://www.dnrm.qld.gov.au>) has more information on how the layer is applied under the State Development Assessment Provisions - Module 8: Native vegetation clearing and the *Vegetation Management Act 1999*.

Regional ecosystem is a mandatory essential habitat factor, unless otherwise stated.

Essential habitat, for protected wildlife, means a category A area, a category B area or category C area shown on the regulated vegetation management map-

- 1) (a) that has at least 3 essential habitat factors for the protected wildlife that must include any essential habitat factors that are stated as mandatory for the protected wildlife in the essential habitat database; or
- 2) (b) in which the protected wildlife, at any stage of its life cycle, is located.

Essential habitat identifies endangered or vulnerable native wildlife prescribed under the *Nature Conservation Act 1994*.

Essential habitat in Category A and B (Remnant vegetation species record) areas:1100m Species Information

| Label | Scientific Name         | Common Name                 | NCA Status | Vegetation Community                                                                                                                                                                                                                                                                                                            | Altitude            | Soils                                    | Position in Landscape |
|-------|-------------------------|-----------------------------|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|------------------------------------------|-----------------------|
| 2014  | Ornithoptera richmondia | Richmond Birdwing Butterfly | V          | Lowland (including littoral & gallery) and upland subtropical rainforest with Paristolochia praevenosa and P. laheyana respectively; P. praevenosa occurs below 600m asl on basaltic slopes, creek banks, or on volcanic alluvial soils near watercourses, while P. laheyana occurs on basaltic ridges and slopes at >800m asl. | Sea level to >800m. | Basalt and volcanic alluvial substrates. | None                  |

Essential habitat in Category A and B (Remnant vegetation species record) areas:1100m Regional Ecosystems Information

| Label | Regional Ecosystem (this is a mandatory essential habitat factor, unless otherwise stated)                                                                                                                                         |
|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2014  | 12.2.1, 12.2.2, 12.2.3, 12.5.13, 12.8.3, 12.8.4, 12.8.5, 12.8.6, 12.8.7, 12.8.13, 12.8.18, 12.8.21, 12.8.22, 12.9-10.16, 12.11.1, 12.11.4, 12.11.10, 12.11.11, 12.11.12, 12.11.13, 12.12.1, 12.12.13, 12.12.16, 12.12.17, 12.12.18 |

Essential habitat in Category A and B (Remnant vegetation) areas:1100m Species Information

| Label | Scientific Name             | Common Name       | NCA Status | Vegetation Community                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Altitude           | Soils                                | Position in Landscape |
|-------|-----------------------------|-------------------|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|--------------------------------------|-----------------------|
| 609   | Litoria freycineti          | Wallum Rocketfrog | V          | Vegetation community is a mandatory essential habitat factor for this species. Freshwater acidic swamps/lagoons (permanent or temporary still water) dominated by sedges (e.g. Baumea and Eleocharis spp.) in heathland (e.g. Banksia/Xanthorrhoea), wallum (Banksia aemula shrubland/woodland) or Melaleuca open forest (e.g. M. quinquenervia), and adjacent Eucalyptus racemosa forest, also found around acidic coastal lakes; on sand and sandstone; can be found well away from water during non-breeding season.                                            | Sea level to 200m. | Sandy and alluvial substrates.       | None                  |
| 686   | Crinia tinnula              | Wallum Froglet    | V          | Vegetation community is a mandatory essential habitat factor for this species. Permanent to ephemeral acidic (pH 4.3 - 5.2), soft freshwater in Melaleuca (e.g. M. quinquenervia) swamps, sedgeland, wet and dry heathland (e.g. Banksia robur, Xanthorrhoea) and wallum (Banksia aemula shrubland/woodland) areas coastal lowlands on sand or sandstone, occasionally in adjacent open forest/woodland (e.g. Eucalyptus racemosa, Corymbia citriodora) with heathy understorey; known to persist in small remnants (<10ha); may be found well away from water.    | Sea level to 200m. | Sandy and sandy-alluvial substrates. | None                  |
| 1135  | Pezoporus wallicus wallicus | Ground Parrot     | V          | Lowland dry and wet heathland (0.25-1.5m high, diverse shrubs, sedges & rushes), sedgeplain and sedgeland (excl. permanent waterbodies); rarely in adjacent Banksia (wallum), Hakea or Melaleuca shrubland/woodland with heath understorey.                                                                                                                                                                                                                                                                                                                        | Sea level to 200m. | Sand and clay substrates.            | Plains and flats.     |
| 593   | Litoria alongburensis       | Wallum Sedgefrog  | V          | Vegetation community is a mandatory essential habitat factor for this species. Well vegetated permanent to ephemeral freshwater swamp, sedgeland, lake or creek, e.g. dense reed beds (including Baumea, Restio spp.) occasionally with Melaleuca quinquenervia or Callistemon pachyphyllus, acidic wallum swamps and wallum creeks on coastal sand masses; most abundant in wallum (Banksia aemula) swamps that seasonally flood where they are found year-round; recorded in adjacent wet heath, dry heath, Gahnia heath and Melaleuca swamp forest/open forest. | Sea level to 200m. | Sandy substrates.                    | Near/in waterbodies.  |

Essential habitat in Category A and B (Remnant vegetation) areas:1100m Regional Ecosystems Information

| Label | Regional Ecosystem (this is a mandatory essential habitat factor, unless otherwise stated)                                                                                                                                    |
|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 609   | 12.2.2, 12.2.5, 12.2.7, 12.2.12, 12.2.13, 12.2.15, 12.3.4, 12.3.5, 12.3.6, 12.3.12, 12.3.13, 12.5.4, 12.5.9, 12.9-10.10, 12.9-10.22. These regional ecosystems are not a mandatory essential habitat factor for this species. |
| 686   | 12.2.5, 12.2.7, 12.2.9, 12.2.10, 12.2.12, 12.2.15, 12.3.4, 12.3.5, 12.3.6, 12.3.12, 12.3.14, 12.5.10. These regional ecosystems are not a mandatory essential habitat factor for this species.                                |
| 1135  | 12.2.12, 12.2.13, 12.2.15, 12.3.13, 12.5.9, 12.9-10.22                                                                                                                                                                        |
| 593   | 12.2.5, 12.2.7, 12.2.12, 12.2.15. These regional ecosystems are not a mandatory essential habitat factor for this species.                                                                                                    |

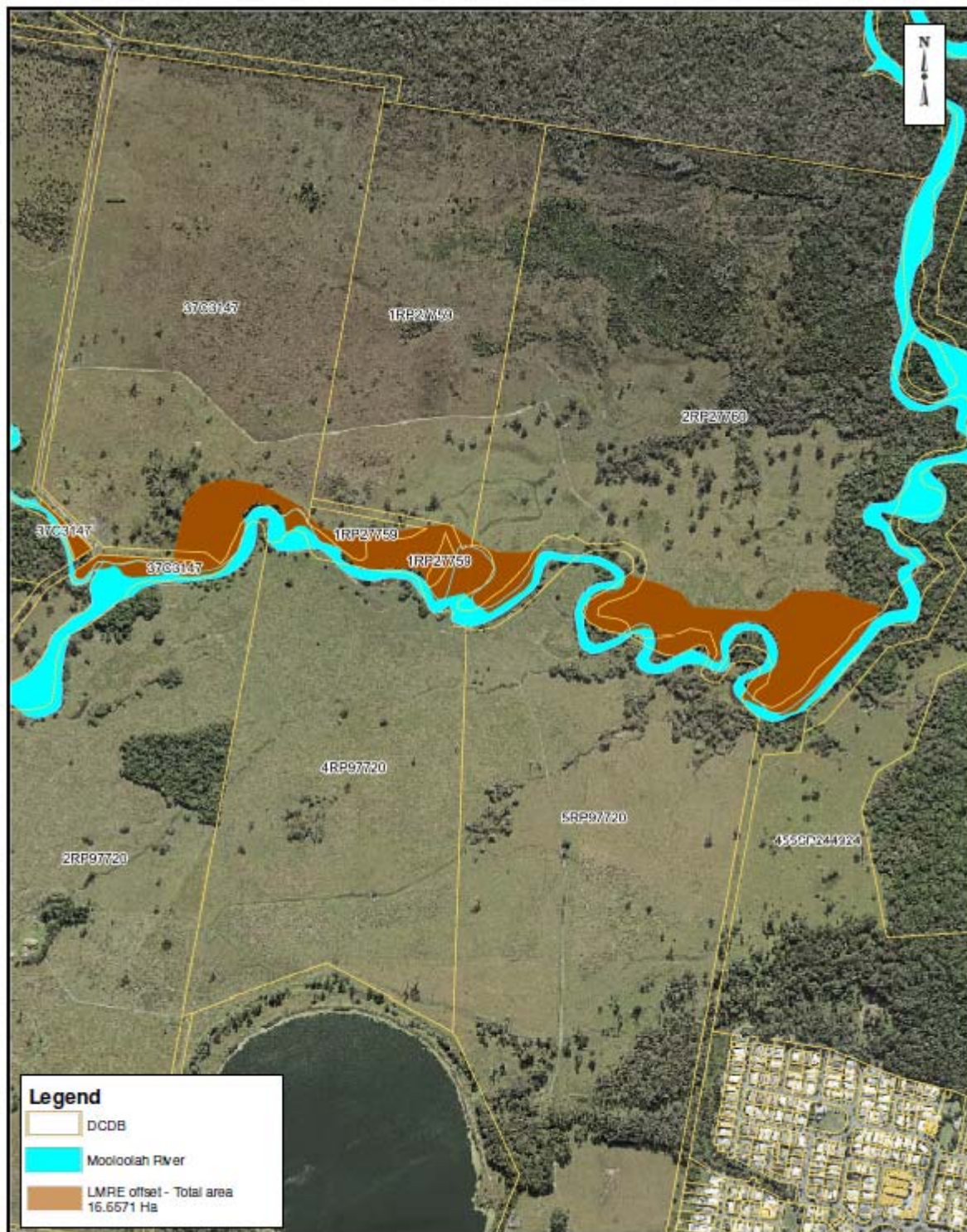
Essential habitat in Category C (High value regrowth vegetation) areas:1100m Species Information

(no results)

Essential habitat in Category C (High value regrowth vegetation) areas:1100m Regional Ecosystems Information

(no results)

# SCHEDULE 3 – OFFSET AREA PLAN



|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                    |                                                                                                                                                       |                              |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|
| <p>Projection: Map Grid of Australia (MGA) Zone 56, Geocentric Datum of Australia (GDA)</p> <p>Date: 1984</p> <p>© The State of Queensland, 2017 © Henty 2006 &amp; 2008 Henty Pty Ltd, 2017</p> <p>Disclaimer: While every care is taken to ensure the accuracy of this data, Henty does not accept any liability for errors or omissions in the information or representations shown on this map. It is intended for use as a guide only and should not be relied upon for any purpose. It is not intended to be used for any purpose other than the purpose for which it was created. It is not intended to be used for any purpose other than the purpose for which it was created. It is not intended to be used for any purpose other than the purpose for which it was created.</p> | <p><b>Mooloolah River</b></p> <p><b>Lower Mooloolah River Environment</b></p> <p><b>Reserve (LMRE Reserve)</b></p> | <p>Plan No: <b>Map1</b></p> <p>Job No: <b>A</b></p> <p>Date: <b>13/03/2017</b></p> <p>Drawn by: <b>R Friend</b></p> <p>Checked by: <b>S Scott</b></p> | <p>Queensland Government</p> |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|

## SCHEDULE 4 – ROAD CORRIDOR CLOSURE PLAN



Road areas shown in orange to be closed.

## SCHEDULE 5 – SERVICES

### SERVICES

1. Council is to provide all the services outlined in paragraph 2 below necessary to legally secure and implement the Offset Project and ensure that by the tenth anniversary of the Commencement of the Action Date, the Offset Project meets the following condition thresholds as per condition 2(b) of the EPBC Approval:
  - (a) canopy cover: at least 70% of canopy vegetation is native;
  - (b) species cover: contains 30 native woody species from the Lowland Rainforest of Subtropical Australia threatened ecological community listing advice; and
  - (c) total vegetation: at least 70% of total vegetation cover is native.
2. Services to be provided by Council include:
  - Definition of the extent (in GIS) of the Offset Project area
  - Appointment of contractor
  - EPBC approval is reviewed by Council prior to the commencement of site works
  - Review of Offset Management Plan prior to commencement of works
  - Rehabilitation of existing vegetation
  - Plant selection, if required
  - Planting of additional plants, as required
  - Watering of new plant stock, as required
  - Weed management
  - Fencing
  - Establishment of access
  - Removal of cattle access
  - Applying a Legally Binding Mechanism
  - Monitoring
  - Reporting

## Execution page

**EXECUTED** as a Conservation Agreement under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth)

**SIGNED** on behalf of the **Commonwealth of Australia** as represented by the delegate of the Minister for the Environment and Energy

Gregory J Manning  
Name  
Assistant Secretary  
Position  
[Signature]  
Signature  
6/6/18  
Date

VAUGHN E COX  
Name of witness (print)  
ASSISTANT DIRECTOR  
Signature of witness  
[Signature]  
Date  
6/6/2018

**SIGNED** on behalf of the **State of Queensland (represented by Department of Transport and Main Roads)** by an authorised representative

Leah McKenzie  
Name  
District Director  
Position  
[Signature]  
Signature  
13/12/17  
Date

FRANCES MOORE  
Name of witness (print)  
JUSTICE OF THE PEACE  
JP (Qual)  
[Signature]  
Signature of witness  
13/12/2017  
Date



**SIGNED** on behalf of the **State of Queensland (represented by Department of Natural Resources, Mines and Energy)** by an authorised representative

Teresa Furnell  
Name

Principal Land Officer  
Position

TB Furnell  
Signature

18.12.17  
Date

KAREN ANNE NORLEY  
Name of witness (print)

C.DEC 107637

KANORLEY  
Signature of witness

18.12.2017  
Date

**SIGNED** on behalf of the **Sunshine Coast Regional Council** by an authorised representative

Michael Whittaker  
Name

Chief Executive Officer  
Position

M Whittaker  
Signature

2 March 2018  
Date

Baylee Casper  
Name of witness (print)

BCasper  
Signature of witness

2 March 2018  
Date