

# Addendum to Offsite Offset Management Plan for 215 Cooper Street, New Epping, Victoria

**Date:** 25 June 2024

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**Ref:** 14592

## 1 Introduction

Ecology and Heritage Partners Pty Ltd was commissioned by Riverlee Caruso Epping Pty Ltd to provide a summary of updates to the existing Offsite Offset Management Plan (OMP) prepared by Ecology Australia for the proposed development at 215, 315W and 325C Cooper Street, New Epping.

Updates to the OMP are presented in this addendum in the below tables.

## 2 Background

The property at 215 Cooper Street, New Epping is approximately 45.5 ha where the majority of the land was historically used to quarry basalt. This activity has left large pits. The majority were backfilled following completion of quarrying, however some remained open resulting in a collection of permanent and ephemeral waterbodies.

This site now supports a regionally significant population of Growling Grass Frog *Litoria raniformis major* and that have been detected throughout the property. Growling Grass Frog is listed as vulnerable under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and *Flora and Fauna Guarantee Act 1988* (FFG Act). An extant population of Golden Sun Moth also occurs on the property at 315W and 325C Cooper Street, New Epping. Golden Sun Moth area listed as vulnerable under the EPBC Act and FFG Act. Offsets for Golden Sun Moth will be secured in the Western Grassland Reserve and are covered in less detail in the management plan.

## 3 Updates to the Management Plan

The Onsite OMP was prepared for the study area to address the impacts of the development on site and set out management objective for managing the existing population of Growling Grass Frog. The management plan was prepared in 2019 by Ecology Australia Pty Ltd however, due to changes across the site including construction timing and the extent of the habitat corridor updates to this document are required and is the subject of this addendum.

This OMP has been updated in accordance with Condition 22 and 23 of the EPBC Approval (EPBC 2016/7755) as we have assessed that the changes do not result in a new or increased impact. The changes made to the OMP are predominately administrative and relate to updates to project timing (i.e. program updates) and changes as a results of minor adjustment to the habitat corridor boundary in accordance with the approved Development Plan boundaries. A summary of the changes made to the OMP are provided in Section 4 below.

The following addendum schedule sets out our proposed amendments to the 'current' OMP (Ecology Australia dated 1/12/2020 as submitted on the 9/9/2019 and 16/05/2023). The schedule lists references points and nominated text that is proposed to be amended within the 'current' OMP, and states the alternative text under 'Updated text'. This addendum should be read in conjunction with OMP dated 1/12/2020 (Appendix 1).

#### 4 Addendum to Offsite Offset Management Plan

Update #	Section	Page	Paragraph	Current text	Updated text
1	Entire report	-	-	Department of Environment, Land, Water and Planning (DELWP)	Department of Department of Energy, Environment and Climate Action (DEECA)
2	Entire report	-	-	Department of the Environment and Energy (DoEE)	Department of Climate Change, Energy, the Environment and Water (DCCEEW)
3	Summary	1	4	To compensate for the loss of 17.39 ha of Growling Grass Frog habitat, the approval holder must implement the Growling Grass Frog Offset Strategy, and ensure that a viable population of the Growling Grass Frogs is maintained at the proposed offset area for the life of the approval.	To compensate for the loss of <b>15.67 ha</b> of Growling Grass Frog habitat, the approval holder must implement the Growling Grass Frog Offset Strategy, and ensure that a viable population of the Growling Grass Frogs is maintained at the proposed offset area for the life of the approval.
4	Figure 1	4	-	-	<b>Update:</b> Figure 1 updated.
5	Figure 2	5	-	-	<b>Update:</b> Figure 2 updated.
6	Section 1	6	Point 1	11.44 ha of onsite offsets (68.7%), which will be met by constructing a habitat corridor along Edgars Creek that is specifically designed to provide good quality habitat for Growling Grass Frogs, covered in the onsite OMP and the EMP (Ecology Australia 2019a; b).	<b>12.82 ha of onsite offsets (65.01%)</b> , which will be met by constructing a habitat corridor along Edgars Creek that is specifically designed to provide good quality habitat for Growling Grass Frogs, covered in the onsite OMP and the EMP (Ecology Australia 2019a; b).
7	Section 1	6	Point 2	6.9 ha of offsite offsets (31.7%), at a known site of high quality Growling Grass Frog habitat at Perry Bridge, in central Gippsland approximately 200 km east of New Epping. This site will be covered in this offsite OMP.	6.9 ha of offsets ( <b>34.98%</b> ), at a known site of high quality Growling Grass Frog habitat at Perry Bridge, in central Gippsland approximately 200 km east of New Epping. This site will be covered in this offsite OMP.
8	Section 3.2.2	9	Paragraph 1	As a result of the development, 17.39 ha of potential Growling Grass Frog habitat will be cleared.	As a result of the development, <b>15.67 ha</b> of potential Growling Grass Frog habitat will be cleared.
9	Section 3.2.2	9	Point 3	9.13 ha of terrestrial habitat suitable for Growling Grass Frogs.	<b>7.41 ha</b> of terrestrial habitat suitable for Growling Grass Frogs.

Update #	Section	Page	Paragraph	Current text	Updated text
10	Section 3.2.2	9	2	The majority (68.7%) of the quantum of impact will be offset with a Growling Grass Frog habitat corridor to be constructed on site.	The majority ( <b>65.01%</b> ) of the quantum of impact will be offset with a Growling Grass Frog habitat corridor to be constructed on site.
11	Section 3.2.2	10	1	The remainder of the impact (31.7%) will be offset offsite at a site in Perry Bridge approximately 200km east of the project site (Figure 3).	The remainder of the impact ( <b>34.98%</b> ) will be offset offsite at a site in Perry Bridge approximately 200km east of the project site (Figure 3).
12	Section 4.1	18	Table 2	To compensate for the loss of 17.39 ha of Growling Grass frog habitat, the approval holder must implement the Growling Grass Frog Offset Strategy, and ensure that a viable population of the Growling Grass Frogs is maintained at the proposed offset areas for 10 years.	To compensate for the loss of <b>15.67 ha</b> of Growling Grass frog habitat, the approval holder must implement the Growling Grass Frog Offset Strategy, and ensure that a viable population of the Growling Grass Frogs is maintained at the proposed offset areas for 10 years.
13	Section 4.1	18	Table 2	Conditions 4 and 21	<b>Condition 4 and 21:</b> updated as per EPBC approval variation.
14	Section 4.4	22	Row 3	2019/2020	29/06/2023
15	Section 4.4	22	Row 4	2020	30/06/2023
16	Section 4.4	22	Row 6	2019/2020	29/06/2023
17	Section 5.3	29	1	However, if it becomes clogged with emergent and fringing vegetation or sediment, some vegetation and/or sediment should be removed.	<b>Add sentence:</b> These works must be overseen by an Ecologist.
18	Section 5.3	29	4	Remove emergent vegetation and or sediment if the wetland becomes clogged with vegetation or full of sediment.	Remove emergent vegetation and or sediment if the wetland becomes clogged with vegetation or full of sediment <b>in accordance with the Guidelines and a suitably qualified Ecologist.</b>
19	Section 5.4.2	33	4	Monitoring of weeds will be conducted annually in spring.	Monitoring of weeds will be conducted annually.
20	Section 5.7.1	36	2		<b>Add sentence:</b> All works must be undertaken in conjunction with a suitably qualified Ecologist



Update #	Section	Page	Paragraph	Current text	Updated text
21	Section 5.8	37	Point 1	Add logs and/or large rocks/ boulders to the offset sites	<b>Add sentence:</b> Suitably qualified Ecologist to provide guidance
22	Section 5.10	38	Point 1	Clean vehicles coming on site and/or ensure vehicles have been washed down immediately prior to coming on site	Clean vehicles coming <b>onto the offset</b> site and/or ensure vehicles have been washed down immediately prior to coming <b>onto the offset</b> site.
23	Section 5.12	41	Paragraph 1	Management actions to be carried out in perpetuity following the initial 10 year management will aim to maintain the habitat created over the 10 year management period.	<b>Add sentence:</b> Any physical disturbance to the site needs to be undertaken in accordance with a relevant expert.
24	Section 6	47	Table 8	-	Refer to updated Table 8 below.
25	Section 7.1.1	51	Table 9	Salinity is consistently high in wetlands, particularly at southern offset site: <u>Moderate risk</u>	<b>Update:</b> High risk
26	Section 7.1.1	50	Table 9	Wetlands clogged with emergent vegetation or sediment: <u>Low risk</u>	<b>Update:</b> Moderate to high risk
27	Section 12	64-65	Glossary	<ul style="list-style-type: none"> <li>- DELWP – Victoria Department of Environment, Land, Water and Planning</li> <li>- DoEE – Commonwealth Department of Environment and Energy</li> </ul>	<ul style="list-style-type: none"> <li>- DEECA – Department of Department of Energy, Environment and Climate Action</li> <li>- DCCEEW – Department of Climate Change, Energy, the Environment and Water</li> </ul>

#### 4.1 Table Updates

**Updated Table 8.** Implementation plan for the proposed management actions and monitoring to be conducted over the 10 year management plan and ongoing in perpetuity, based on the offsets being established at the end of 2022.

Specific management and monitoring actions (e.g. weed monitoring and control) are highlighted in dark aqua, with as required management activities (e.g. maintaining fencelines) outlined in light aqua. Less formal ongoing management and monitoring (e.g. a site walkover with weed control) are indicated by cross-hatched square. Seasons are indicated by A = autumn, W = winter, S = spring, Su= summer.

Works	2023				2024				2025				2026				2027				2028				2029				2030				2031				2032				Ongoing																							
	A	W	S	SU	A	W	S	SU	A	W	S	SU	A	W	S	SU	A	W	S	SU	A	W	S	SU	A	W	S	SU	A	W	S	SU	A	W	S	SU	A	W	S	SU	A	W	S	SU	A	W	S	SU																
Fence offsets, maintain fence lines	Light aqua				Light aqua				Light aqua				Light aqua				Light aqua				Light aqua				Light aqua				Light aqua				Light aqua				Light aqua				Light aqua				Light aqua				Light aqua															
Construct new wetlands, modify causeway		Dark aqua																																																														
Weed management			Dark aqua				Dark aqua				Dark aqua				Dark aqua				Dark aqua				Dark aqua				Dark aqua				Dark aqua				Dark aqua				Dark aqua				Dark aqua				Dark aqua				Dark aqua				Dark aqua									
Pest animal control	Light aqua				Light aqua				Light aqua				Light aqua				Light aqua				Light aqua				Light aqua				Light aqua				Light aqua				Light aqua				Light aqua				Light aqua				Light aqua															
Native tree and shrub recruitment			Dark aqua				Dark aqua				Dark aqua				Dark aqua				Dark aqua				Dark aqua				Dark aqua				Dark aqua				Dark aqua				Dark aqua				Dark aqua				Dark aqua				Dark aqua													
Infill low areas of riverbank at southern offset		Dark aqua																																																														
Add new overwintering habitat		Dark aqua																																																														
Managing wetland depth and vegetation Chytrid control			Dark aqua				Dark aqua				Dark aqua				Dark aqua				Dark aqua				Dark aqua				Dark aqua				Dark aqua				Dark aqua				Dark aqua				Dark aqua				Dark aqua																	
Growling Grass Frog population monitoring	Light aqua				Light aqua				Light aqua				Light aqua				Light aqua				Light aqua				Light aqua				Light aqua				Light aqua				Light aqua				Light aqua				Light aqua																			
Growling Grass Frog habitat monitoring			Dark aqua	Dark aqua			Dark aqua	Dark aqua			Dark aqua	Dark aqua			Dark aqua	Dark aqua			Dark aqua	Dark aqua			Dark aqua	Dark aqua			Dark aqua	Dark aqua			Dark aqua	Dark aqua			Dark aqua	Dark aqua			Dark aqua	Dark aqua			Dark aqua	Dark aqua			Dark aqua	Dark aqua																
Fence offsets, maintain fence lines			Dark aqua				Dark aqua				Dark aqua				Dark aqua				Dark aqua				Dark aqua				Dark aqua				Dark aqua				Dark aqua				Dark aqua				Dark aqua				Dark aqua																	

## Updated Figures

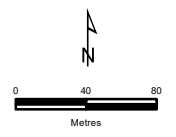
**Updated Figure 1**





**Figure 1**  
**Project area boundaries and stages**  
*Offset Management Plan: 215, 315W and 325C Cooper Street, Epping*

- Legend**
- Property area
  - Stages**
  - Stage 1
  - Stage 2



Map Scale: 1:4,300 @ A4  
 Coordinate System: GDA 1994 MGA Zone 55

VicMap Data: The State of Victoria does not warrant the accuracy or completeness of information in this publication and any person using or relying upon such information does so on the basis that the State of Victoria shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in the information.



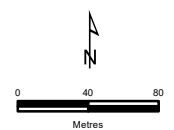
## Updated Figure 2





**Figure 2**  
**Existing conditions and wetland**  
*Offset Management Plan: 215, 315W and 325C Cooper Street, Epping*

**Legend**  
 Project area  
 Existing wetlands



Map Scale: 1:4,300 @ A4  
 Coordinate System:  
 GDA 1994 MGA Zone 55

VicMap Data: The State of Victoria does not warrant the accuracy or completeness of information in this publication and any person using or relying upon such information does so on the basis that the State of Victoria shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in the information.



**Appendix 1 – Offset Management Plan: 191 Springberg Lane, Perry Bridge**





ECOLOGY  
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# Offset Management Plan: 191 Springberg Lane, Perry Bridge (EPBC 2016/7755)



Prepared for: Verve Projects

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Final	New offset boundaries	M Le Feuvre	M Pritchard	1/12/2020

Cover photo: The proposed southern offset site (M. Le Feuvre)



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## Acknowledgments

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- Robert Cromb                      Landowner 191 Springberg Lane, Perry Bridge
- Jamie McMahon                    Ecology Australia
- Ben Rowe                            Riverlee
- Richard Johnston                   Riverlee
- Tim Stephens                        Verve Projects
- Cameron Delarue                    Verve Projects

## Declaration of accuracy

**Riverlee Caruso Epping Pty Ltd (ACN 605 442 500)**  
**Staged Redevelopment of 215, 315W and 325C Cooper St**  
**Epping, Victoria, 3076**  
**EPBC 2016/7755**

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

Signed



Andrew McMahon  
Principal Ecologist  
Ecology Australia Pty Ltd

## Summary

Ecology Australia Pty Ltd was commissioned by Riverlee Caruso Epping Pty Ltd (“Riverlee”) to prepare an Offset Management Plan (OMP) for an offsite offset site required for impacts to matters of national environmental significance as a result of the redevelopment of 215, 315W and 325C Cooper Street, Epping (“New Epping”) for residential and commercial uses.

The 51 ha site has a long history of intensive land use including stock grazing, quarrying and landfill activities, that has all but eliminated native vegetation, and the site is now severely degraded and overwhelmingly dominated by weed species. Despite the low quality habitat present, the site supports an important population of Growling Grass Frog (*Litoria raniformis*) that inhabits the disused quarry pits. The Growling Grass Frog is listed as Vulnerable under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), listed as threatened under the *Flora and Fauna Guarantee Act 1988* (FFG Act) and is classified as endangered in Victoria (DSE 2013). The largest quarry pit is fed by groundwater and as a result provides permanent, off-channel habitat for Growling Grass Frogs. Two more water bodies are near permanent, and provide good habitat for Growling Grass Frogs in most years. The remaining eight waterbodies are ephemeral, and provide habitat for Growling Grass Frogs in wet years.

Riverlee proposes to remove the majority of Growling Grass Frog habitat present on site as part of the development. Impacts to Growling Grass Frogs will be offset using a combination of offsite and onsite offsets. Management of the off-site offset following construction of New Epping make up the bulk of this OMP. Management of the onsite offset during construction activities are covered in an additional Environment Management Plan (Ecology Australia 2019a).

This OMP addresses the following specific EPBC Act Approval (2016/7755) conditions:

- ~~To compensate for the loss of 17.39 ha of Growling Grass Frog habitat, the approval holder must implement the Growling Grass Frog Offset Strategy, and ensure that a viable population of the Growling Grass Frogs is maintained at the proposed offset area for the life of the approval.~~
- *Prior to the commencement of the action, the approval holder must prepare Offset Management Plans for the onsite and offsite offset areas proposed in the Growling Grass Frog Offset Strategy. The approval holder must not commence the action until both Offset Management Plans have been prepared. Each approved Offset Management Plan must be implemented for the life of the approval.*
- *Within three (3) months following the third and fourth anniversary of the commencement of the action, the approval holder must provide a report demonstrating that a viable population of Growling Grass Frog has been maintained at the onsite offset site (as required under the Growling Grass Frog Offset Strategy). The report must be prepared by a suitable qualified expert.*
- *All management plans required under this approval should be prepared in line with the Department’s Environmental Management Plan Guidelines.*
- *The approval holder must prepare a compliance report for each 12 month period following the date of commencement of the action, or as otherwise agreed to in writing by the Minister*

Refer to  
update #3



- *The approval holder must notify the Department in writing of any: incident; non-compliance with the conditions; or non-compliance with the commitments made in plans. The notification must be given as soon as practicable, and no later than two business days after becoming aware of the incident or non-compliance.*
- *The approval holder must ensure that independent audits of compliance with the conditions are conducted for the 12 month period from commencement of the action and for every subsequent 24 month period until this approval expires, or as requested in writing by the Minister.*
- *The approval holder may, at any time, apply to the Minister for a variation to an action management plan approved by the Minister under condition 4, or as subsequently revised in accordance with these conditions, by submitting an application in accordance with the requirements of section 143A of the EPBC Act. If the Minister approves a revised action management plan (RAMP) then, from the date specified, the approval holder must implement the RAMP in place of the previous action management plan.*

Riverlee proposes to establish two offset sites totalling 6.9 ha on a property known to support a regionally significant Growling Grass Frog population. The northern offset site has a permanent freshwater spring fed soak and a drainage depression. The soak overflows into the drainage depression, providing additional permanent habitat. The southern offset site contains a large wetland fed by overland flow, and provides a large area of Growling Grass Frog habitat in wetter years. Both sites support large areas of terrestrial habitat suitable for Growling Grass Frog foraging and dispersal.

In addition, the Green and Golden Bell Frog (*Litoria aurea*) is known to be present at the property. Green and Golden Bell Frog is listed as Vulnerable under the EPBC Act and classified as vulnerable in Victoria (DSE 2013).

This OMP outlines management actions to protect and improve the Growling Grass Frog population and habitat across the offset sites. The actions include, but are not limited to the following:

- Fencing the offset sites
- Creating additional wetland habitats at the offset sites.
- Monitoring and controlling weeds and pest animals on site.
- Assessing the cover of native trees and shrubs on site, and controlling as required.
- Monitoring water quality, especially salinity, in wetlands.
- Controlling the spread of chytrid on site.
- Monitoring the Growling Grass Frog population and habitat on site.

This OMP contains a comprehensive risk assessment for the ongoing management of the site, and outlines the monitoring, reporting, auditing and OMP review requirements for the project.

This OMP will remain in force for 10 years.

## 1 Introduction

Ecology Australia Pty Ltd was commissioned by Riverlee Caruso Epping Pty Ltd (“Riverlee”) to prepare an Offset Management Plan (OMP) for an off-site offset site required for impacts to matters of national environmental significance as a result of the redevelopment of 215, 315W and 325C Cooper Street, Epping (“New Epping”) for residential and commercial uses (Figure 1). This is outlined in *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) Referral 2016/7755 (Ecology Australia 2018). This OMP outlines management actions to protect and improve the Growling Grass Frog population and habitat across the offset sites.

The property at 215 Cooper Street comprises 45.5 ha of private land (Figure 1). The eastern portion of this property was used to quarry basalt, and subsequently as a landfill until 1998, after which it was capped and rehabilitated. The central and northern areas were also used to quarry basalt, leaving behind some large pits that are now a collection of permanent and ephemeral waterbodies (Figure 1 and Figure 2). The adjoining properties to the west comprise c. 3.5 ha of Council owned private land (road reserve, 315W Cooper Street) and c. 2.1 ha of State Government owned public land (325C Cooper Street). These two properties do not appear to have undergone historic earthworks and are dominated by introduced Chilean Needle-grass \**Nassella neesiana* which is maintained by mowing/slashing. Edgars Creek traverses the site from north to south. A long history of stock grazing followed by quarrying and landfill activities has all but eliminated native vegetation, and the site is now severely degraded and overwhelmingly dominated by weed species (Ecology Australia 2015).

Despite the degraded habitat present, the site supports an important population of Growling Grass Frog (*Litoria raniformis*) that inhabits the disused quarry pits (Wildlife Profiles 2015; Ecology Australia 2017a). The Growling Grass Frog is listed as Vulnerable under the EPBC Act, listed as threatened under the *Flora and Fauna Guarantee Act 1988* (FFG Act) and is classified as endangered in Victoria (DSE 2013). The largest quarry pit (Waterbody 1, Figure 2) is fed by groundwater and as a result provides permanent, off-channel habitat for the Growling Grass Frogs. Two more water bodies are near permanent (Wetlands 2 and 3, Figure 2), and provide good habitat for Growling Grass Frogs in most years. The remaining seven waterbodies are ephemeral, and provide habitat for Growling Grass Frogs in wet years. In total, there is roughly 17.39 ha of potential Growling Grass Frog habitat onsite (EA 2018).

In addition, a small population of Golden Sun Moth (*Synemon plana*) is present on site, primarily in Chilean Needle-grass dominated grasslands at 315W and 325C Cooper St. The Golden Sun Moth is listed as critically endangered under the Commonwealth EPBC Act, listed as threatened under the Victorian FFG Act and classified as critically endangered by DELWP (DSE 2009a). There is approximately 5.5318 ha of Golden Sun Moth habitat on site, the majority of which (5.508 ha) is at 315W and 325C Cooper St.

Riverlee proposes to remove the majority of Growling Grass Frog habitat and all Golden Sun Moth habitat present on site as part of the development. Impacts to Golden Sun Moth will be offset offsite in the Western Grassland Reserve, and will not be covered in this OMP. Impacts to Growling Grass Frogs will be offset using a combination of offsite and onsite offsets. Management of the onsite offset during construction of New Epping are outlined in the EMP (Ecology Australia 2019a) and following construction in the on-site OMP (Ecology Australia 2019b). Ongoing management of the offsite offset will be covered in this OMP.

Refer to update #4

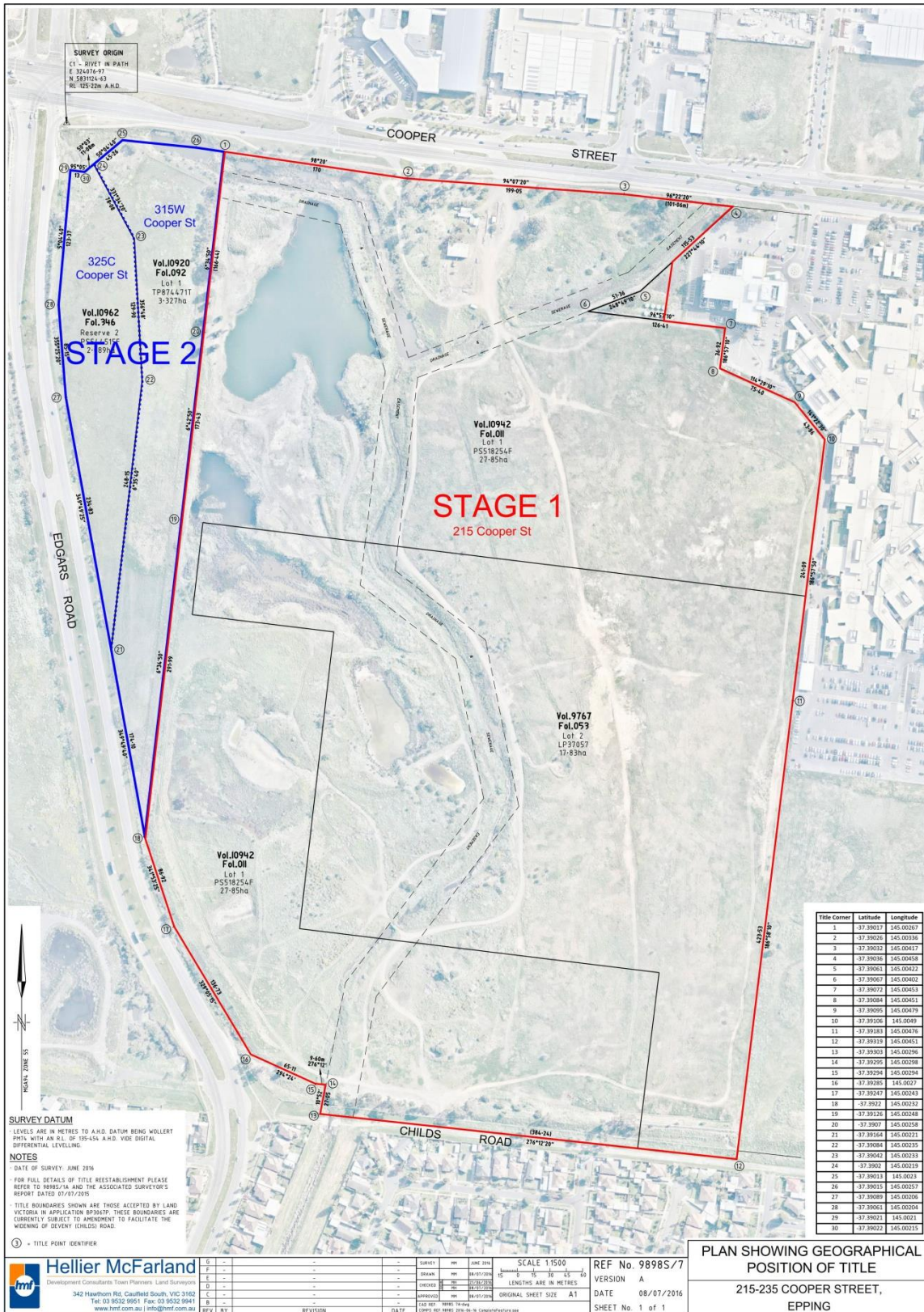


Figure 1 Project area boundaries of the New Epping site, showing Stages 1 and 2 of the proposed development





Figure 2 Epping Quarry site – existing conditions and wetlands (from Wildlife Profiles 2015)

Offsets for the proposed New Epping development are prescribed by the Department of the Environment and Energy (DoEE), based on a thorough assessment of offset requirements using the DoEE offset calculator (DSEWPaC 2012a; b). Using the offset calculator, the calculated quantum of impact is 5.97 adjusted hectares. 18.34 ha of offset, spread across two sites, will meet 100 % of the offset requirements. The two sites constitute:

Refer to  
update #6

- ~~11.44 ha of onsite offsets (68.7%),~~ which will be met by constructing a habitat corridor along Edgars Creek that is specifically designed to provide good quality habitat for Growling Grass Frogs, covered in the onsite OMP and the EMP (Ecology Australia 2019a; b).

Refer to  
update #7

- 6.9 ha of offsite offsets (~~31.7%),~~ at a known site of high quality Growling Grass Frog habitat at Perry Bridge, in central Gippsland approximately 200 km east of New Epping. This site will be covered in this offsite OMP.

Management of the Perry Bridge site will involve active ecological management of the site, ongoing monitoring and reporting.

## 2 Objectives

The objectives of this OMP are to document the details of the site to be impacted and the offset site to meet EPBC Act approvals requirements to offset impacts to Growling Grass Frog. Impacts will be offset by securing, maintaining, improving and monitoring the Growling Grass Frog population and habitat present on site. This OMP aims to:

- Identify the proposed Growling Grass Frog offset area at 191 Springberg Lane, Perry Bridge.
- Develop an Offset Management Plan to compensate for the permitted Growling Grass Frog habitat loss as a result of the New Epping development. This includes the following
  - Location and map of the offset site
  - The type of offset to be secured.
  - How the offset will be secured.
  - Necessary management actions to protect and improve Growling Grass Frog habitat on site.
  - Schedules of management actions and reviews.
  - Details of ongoing monitoring, and evaluation of the management plan.
- Provide an OMP to the satisfaction of the DoEE.



### 3 Project description

This section provides details on the site to be impacted, and assesses the suitability of the proposed offset sites.

#### 3.1 Impact site details

Details of the site to be impacted are outlined in Table 1.

**Table 1 Details of the site to be impacted.**

Landowner of site to be impacted	Riverlee Caruso Epping Pty Ltd
Location and address of site to be impacted	215, 315W and 325C Cooper Street, Epping
Local Government Area	City of Whittlesea
Catchment Management Authority	Port Phillip and Western Port
Responsible Authority	Department of the Environment and Energy
Permit Applicant	Riverlee Caruso Epping Pty Ltd

#### 3.2 Habitat to be removed.

The Growling Grass Frog habitat will be removed to facilitate development of the site for residential and commercial purposes and the facilitate remediation of a former landfill and quarry. The land is currently being rezoned from Industrial 3 Zone to a combination of Mixed Use and Special Use Zones under amendment to the City of Whittlesea Planning Scheme C213.

##### 3.2.1 Condition of habitat to be removed

The 51 ha New Epping site is located in Epping, roughly 19 km north of the Melbourne CBD in the City of Whittlesea. The project area occurs within the Victorian Volcanic Plain Bioregion. A long history of intensive land use has all but eliminated native vegetation, and the site is now severely degraded and overwhelmingly dominated by weed species.

The property at 215 Cooper Street comprises 45.5 ha of private land (Figure 1). The eastern portion of this property was used to quarry basalt and subsequently as a landfill until 1998, after which it was capped and rehabilitated. The western portion was largely used to quarry basalt, leaving behind some large pits that now form a collection of permanent and ephemeral waterbodies (Figure 2).

The adjoining properties to the west comprise c. 3.5 ha of Council owned private land (road reserve, 315W Cooper Street) and c. 2.1 ha of State Government owned public land (325C Cooper Street, Figure 1). These two properties do not appear to have undergone historic earthworks and are dominated by introduced Chilean Needle-grass (*Nassella neesiana*) which is maintained by mowing/slashing.

An on-site assessment in February 2015 found that the majority (approximately 49 ha) of the site comprised exotic grasslands, planted exotic trees and waterbodies. The assessment identified 2 ha of native vegetation, based on the Victorian *Native Vegetation Permitted Clearing Regulations*, including remnant patches of native vegetation and scattered trees. Creekline Grassy Woodland EVC is found

along the northern part of Edgars Creek, which has undergone extensive rehabilitation by Melbourne Water 2009/2010 (Ecology Australia 2015). Areas of Aquatic Herbland EVC occur downstream of the Creekline Grassy Woodland along Edgars Creek, while Tall Marsh EVC was observed along the channels of Edgars Creek and Epping Drain. There were also some areas of Plains Grassy Woodland EVC, Heavier-Soils Plains Grassland EVC and Stony Knoll Shrubland (EVC 649) on the plains, and Plains Sedgy Wetland (EVC 647) in some artificial depressions created as part of the quarry and rehabilitation works for the landfill. Fifteen scattered trees were identified onsite and would have once formed part of the Plains Grassy Woodland.

The project area is within the Edgar's Creek catchment, a sub-catchment of Merri Creek. Edgar's Creek is an ephemeral stream with an upstream catchment area of approximately 1,400 hectares; the length of creek within the site is approximately 1.2 km. Water quality monitoring shows no change upstream to downstream of the project area.

The project area also contains ten mostly man made off stream wetlands, including the former quarry pits (Figure 2). These wetlands vary in size from 230 m<sup>2</sup> to 15,200 m<sup>2</sup>. One waterbody is permanent, two are near permanent and the remainder are ephemeral. The large permanent wetland will be retained on site. There are two small in channel wetlands along Edgar's Creek.

The subject landform includes gentle slopes on the capped landfill, steep slopes on former quarry holes, spoil dumps and generally a gentle gradient along Edgars Creek. The history of quarrying and landfill on site has resulted in gross changes to soil profiles and intact soil profiles of clays or clayey loams over basalt now form a minor part of the site.

### 3.2.2 Area of habitat to be removed

Refer to  
update #8

As a result of the development, ~~17.39 ha~~ of potential Growling Grass Frog habitat will be cleared. This includes:

- 1.98 ha of off-channel wetlands
- 6.28 ha of riparian habitat (30 m buffer around wetlands)
- ~~9.13 ha~~ of terrestrial habitat suitable for Growling Grass Frogs.

Refer to  
update #9

A further 30.6 ha of terrestrial habitat unsuitable for Growling Grass Frogs, including the capped landfill and areas away from water bodies, will also be cleared. Using the DoEE offset calculator (DSEWPac 2012b), the quantum of impact is 5.97 adjusted hectares. See Ecology Australia (2018, 2019a) for further information.

~~The majority (68.7%) of the quantum of impact will be offset with a Growling Grass Frog habitat corridor to be constructed on site, which includes a network of eleven off-channel and three in-stream wetlands, and riparian and terrestrial habitat, all of which will be designed and managed specifically for Growling Grass Frog following the DELWP Growling Grass Frog habitat design standards (DELWP 2017a; b). The main permanent quarry water body, which represents the principal Growling Grass Frog drought refuge on site, will be retained and incorporated in to the habitat corridor. The habitat corridor will be constructed before any core Growling Grass Frog habitat (i.e. off channel wetlands with a riparian buffer zone) is removed. A two to four year migration phase and adaptive management phase will precede the removal of existing Growling Grass Frog habitat. See Ecology Australia (2018, 2019b; a) for further information.~~

Refer to  
update #10



The remainder of the impact (31.7%) will be offset offsite at a site in Perry Bridge approximately 200 km east of the project site (Figure 3). This property is known to support a healthy population of Growling Grass Frogs, even in dry years in part due to the presence of spring-fed off channel wetlands. Two offset sites totalling 6.9 ha will be established on the property. The ongoing management of this offsite offset site is the focus of this OMP.

Refer to  
update #11

### 3.3 Description of the offsite offset

The offsite offset will consist of two sites totalling 6.9 ha at 191 Springberg Lane, Perry Bridge (Figure 4), and meet the conditions outlined in the EPBC Act Approval Decision (EPBC 2016/7755, Table 2). The proposed offset site is located in eastern Victoria, approximately 200 km east of the New Epping development (Figure 3). The northern offset site is 3.53 ha and consists of a small spring fed off channel soak, a drainage depression, a recently constructed waterbody and terrestrial habitat (Figure 5, Figure 8). The southern offset site is 3.41 ha and consists of a large, shallow wetland which is fed primarily by overland flow (Figure 6 and Figure 7).

The offset sites are located on the western bank of the Perry River, roughly 2 km upstream of the Avon River and 2.5 km upstream from Lake Wellington. A 13.25 ha EPBC Act Growling Grass Frog offset site already exists on the property, located between the two proposed offset sites. A network of newly constructed wetlands exist immediately to the south of the proposed offset sites and another existing offset site has been established further south adjacent to the confluence of the Perry and Avon Rivers. Growling Grass Frogs are known from the property and the proposed offset sites ((Turner 2019, R Cromb Pers. Comm.); the local Growling Grass Frog population is discussed below (Section 3.3.2).

In addition, the Green and Golden Bell Frog (*Litoria aurea*) is known from property, including both offset sites (Turner 2019, Ecology Australia In Prep). Green and Golden Bell Frog listed as Vulnerable under the EPBC Act and is classified as vulnerable in Victoria (DSE 2013).

#### 3.3.1 Habitat Description

##### Northern Offset Site

The Northern Offset Site is predominantly cleared floodplain closely proximate to the Perry River. The main features include a section of the former riverine escarpment, a soak and surface runoff fed drainage line and a slightly elevated section which separates the drainage line from the river.

The soak provides a near permanent supply of water which renders a freshwater environment to the relatively substantial drainage swale. The swale is also fed from beyond the site to the north, and while no exposed groundwater features are evident, it is likely that seepage plays a role in the overall maintenance of the swale's vegetation. Two freshwater rush species dominate the swale: Pale Rush *Juncus pallidus* and Green Rush *J. gregiflorus*. Other native species include Common Reed *Phragmites australis*, Tall Sedge *Carex appressa*, Common Spike-sedge *Eleocharis acuta*, Small Loosestrife *Lythrum hyssopifolia* and Small River Buttercup *Ranunculus amphitrichus*. There is also a substantial suite of exotics including Couch \**Cynodon dactylon* var. *dactylon*, Water Couch \**Paspalum distichtum* and Yorkshire Fog \**Holcus lanatus*.

This vegetation is secondary or derived, i.e. it is the result of substantial land use changes, and is not a recognised Ecological Vegetation Class. Here it is referred to as a Soak-fed Rushland and its overall extent is shown on Figure 5.

The vegetation of the actual soak (syn. Spring Soak Figure 5) has also been modified. The small groundwater fed pond is fringed by Blackwood *Acacia melanoxylon* and Tree Violet *Melicytus dentatus* s.l., but otherwise supports a suite of wetlands species including Water Ribbons *Triglochin procerum* s.l., Cumbungi *Typha domingensis*, Common Reed and Common Duckweed *Lemna disperma*.

The naturally mounded section of the site supports two specimens of Gippsland Red-Gum over a wholly exotic pasture, comprised mostly of Kikuyu *Cenchrus clandestinus*.

Swamp Scrub EVC – dominated by Swamp Paperbark *Melaleuca ericifolia* – fringes the Perry River, and forms part of the south-eastern corner of the site (Figure 5).

Overall surface expression (Spring Soak) and seepage of groundwater, presumably flowing from the sandy sediments to the north and west – including inland dunes and/or high level alluvium (Douglas and Ferguson 1976), drive a predominantly freshwater environment at the site. Further, a recently excavated shallow depression on the higher section of the site has been colonised by Buck's-horn Plantain *Plantago coronopus* – an exotic herb indicative of brackish conditions. Hence the site conditions appear to be promoting up-slope interception of groundwater and ponding of the Soak-fed Rushland, rather than excavation of ponds, as the most suitable strategy for promoting GGF habitat.

### Southern Offset Site

By contrast, the Southern Offset Site is wholly vegetated, brackish to saline, and reliant on rainfall and overland flows to provide suitable breeding conditions. The existing vegetation reflects the saline conditions likely to result from a substantial salt wedge influencing the Perry River estuary, and emanating from the now saline Lake Wellington (SKM 2010).

The site includes four Ecological Vegetation Classes (Figure 6):

- Tall Marsh EVC, dominated by Common Reed but including the natives Rounded Noon-flower *Disphyma crassifolium* subsp. *clavellatum*, Sea rush *Juncus kraussii* subsp. *australiensis*, Sea Celery *Apium prostratum* subsp. *prostratum* and the exotic Hastate Orache *Atriplex prostrata*, fringes the central lagoon. It is quite likely that Common Reed once occupied the lagoon, but has been restricted by occasional highly saline conditions.
- Swamp Scrub EVC. As for the Northern Offset Site, this EVC borders the Perry River and is similarly dominated by Swamp Paperbark. Other frequently occurring species include Common Reed, Sea Rush and Sea Celery.
- Estuarine Wetland EVC. This EVC typically occurs at more saline sites than Tall Marsh, and here occupies an area near the northern end of the lagoon. The vegetation shares most species in common with Tall Marsh, but the overwhelming dominant shifts from Common Reed to Sea Rush.
- Brackish Herbland EVC. Brackish Herbland is located to the immediate north of Estuarine Wetland. There is reasonable evidence that this is also secondary vegetation but it nonetheless fits the EVC description. The main lines of evidence for its secondary nature are the scattered mature Gippsland Red-gums and the abundance of Swamp Paperbark recruits. At present common species include Shiny Swamp-mat *Selliera radicans*, Rounded Noon-flower, Sat Sea-spurrey *Spergularia brevifolia*, Beaded Glasswort *Sarcocornia quinqueflora* and Berry Saltbush *Atriplex semibaccata*. The current low and open stature of the vegetation is considered

beneficial for GGF – notably as foraging habitat – and should be maintained. This means the Swamp Paperbark recruits should be removed to prevent its possible return to a closed scrub.

As suggested above, the open water lagoon is likely to be a derived habitat resulting from long term salinity changes in the lower reaches of the Perry River. At present the only vegetation in the lagoon is remnant hummocks of Common Reed and Sea Rush, and stumps of Swamp Paperbark. It may be feasible to revegetate the lagoon with salt tolerant submerged aquatics, which would potentially improve its habitat value for GGF. Species that warrant investigation are from the genera *Althenia* (Water-mats) and *Ruppia* (Water Tassels).

In terms of adjoining habitats, a small patch of Grassy Woodland borders the south west corner of the site, pasture and Brackish Herbland adjoin the balance of the site to the west, and The Perry River forms the eastern boundary.

### 3.3.2 Growling Grass Frog population

The Growling Grass Frog is known from proposed offset sites at 191 Springberg Lane, the existing offset site and the surrounding area. However drought conditions have persisted in the region for three years. As Growling Grass Frog populations fluctuate significantly based on prevailing conditions (Heard, Scroggie, and Malone 2012), which has likely led to a decline in the quality of Growling Grass Frog habitat and the size of the population on site.

At the proposed southern offset site, Growling Grass Frogs are known to inhabit the wetland in good (i.e. wetter) years (R Crombe Pers. Comm.). Growling Grass Frog have also been recorded at the northern offset site (Turner 2019). No Growling Grass Frogs were recorded at the two proposed offset sites during surveys by Ecology Australia in 2019 (in prep).

Growling Grass Frog are known from the existing offset on the property (DELWP 2019). Brief surveys by Ecology Australia in 2019 (in prep) recorded Growling Grass Frogs at the existing Growling Grass Frog offset.

Regionally, Growling Grass Frogs were recorded at sites 4 km west and 6 km south-west of the proposed offset sites in 2017 and 2018 respectively. There are a two of records of Growling Grass Frog within 10 km of the property dating from 1982. Finally there are a number of records from around Providence Ponds Nature Flora and Fauna Reserve on the Perry River approximately 15-20 km north of the property (DELWP 2019).

Green and Golden Bell Frogs are known from both proposed offset sites, the existing offset site (Ecology Australia, in prep). Regionally, Green and Golden Bell Frogs were recorded in 2014 at the Dowd Morass Wildlife Reserve approximately 20 km south west of the proposed offset sites (DELWP 2019).





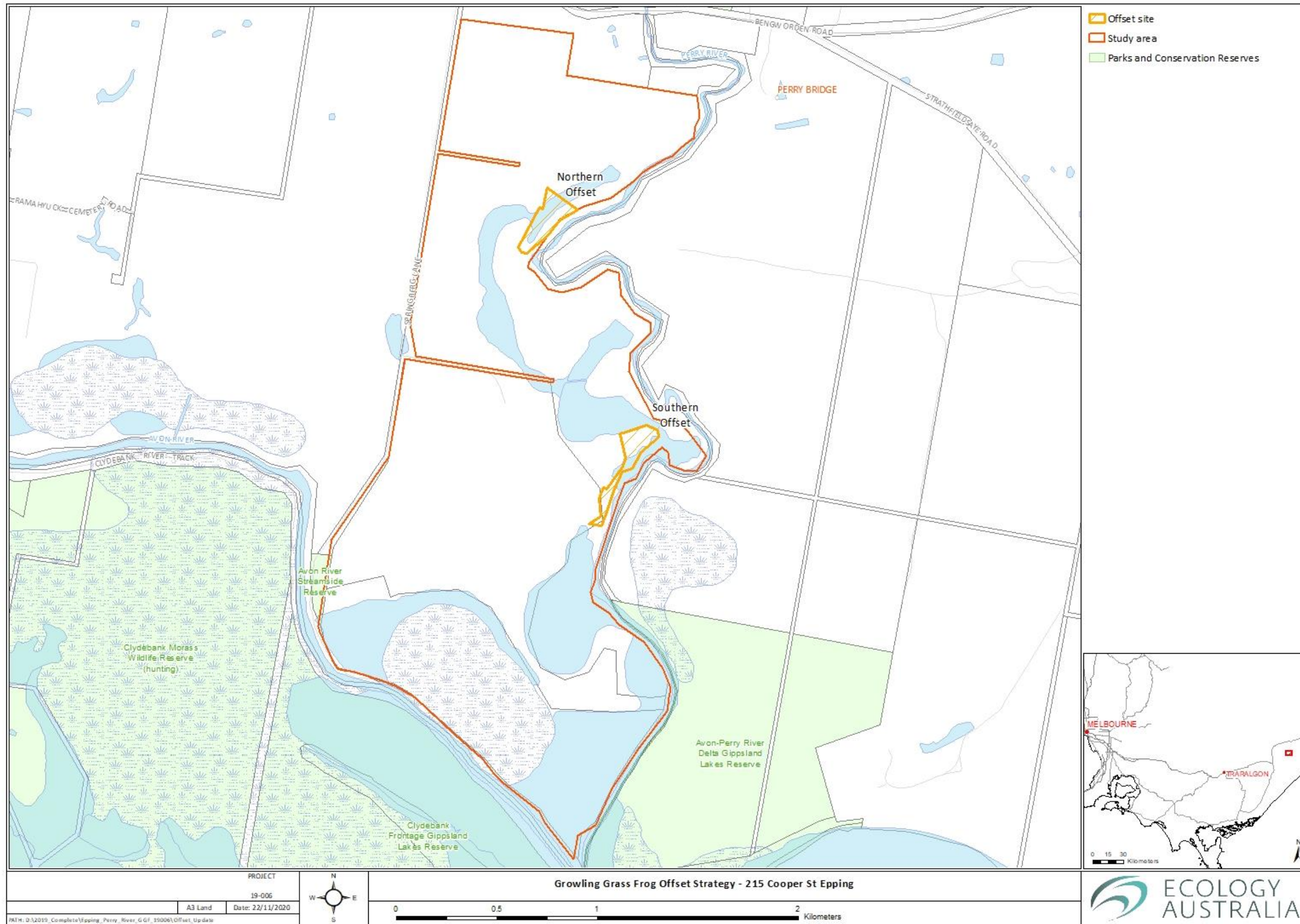


Figure 4 The two proposed offsite offset sites at 191 Springberg Lane, Perry River.



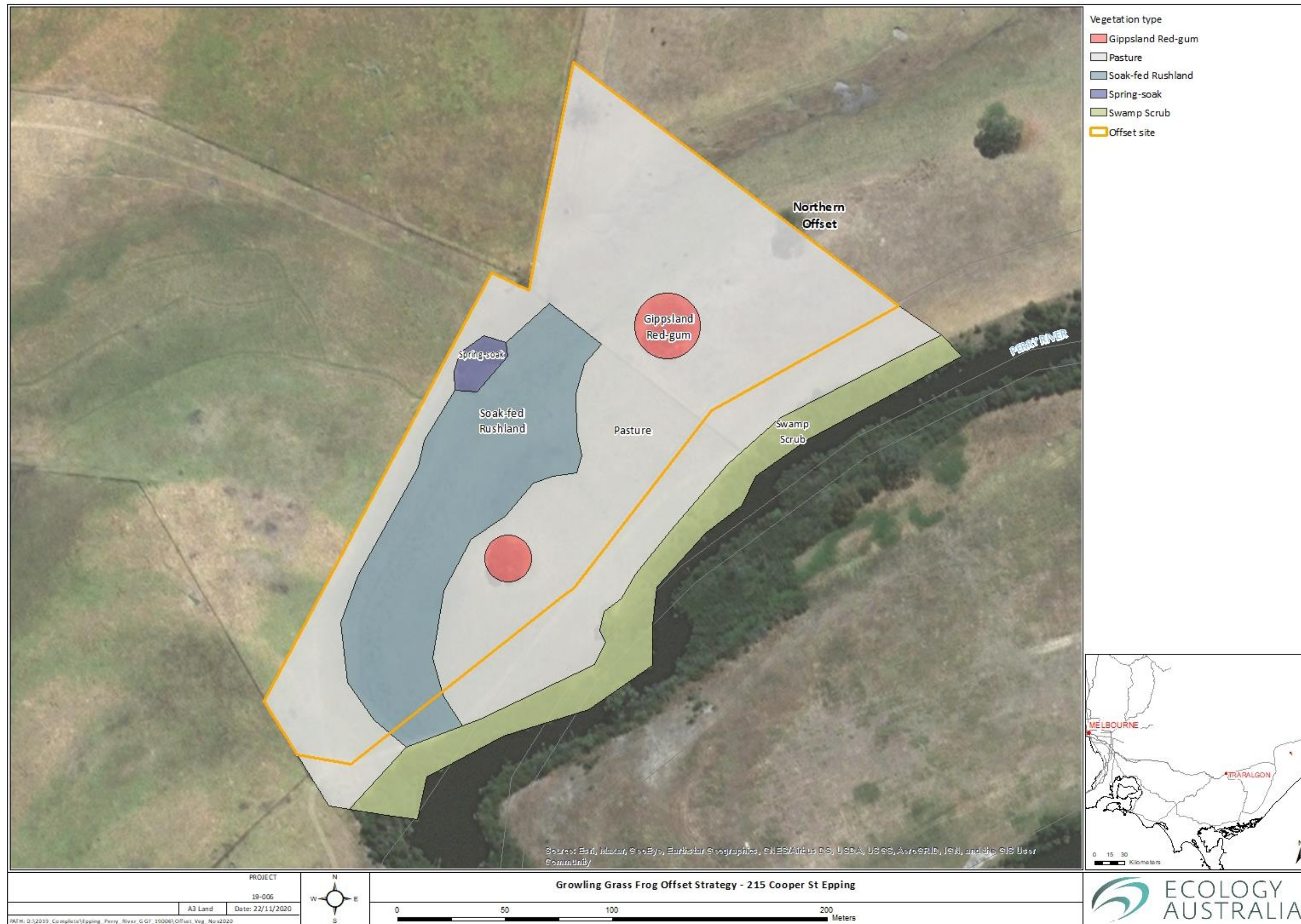


Figure 5 Vegetation types at the proposed northern offset site at 191 Springberg Lane, Parry Bridge.



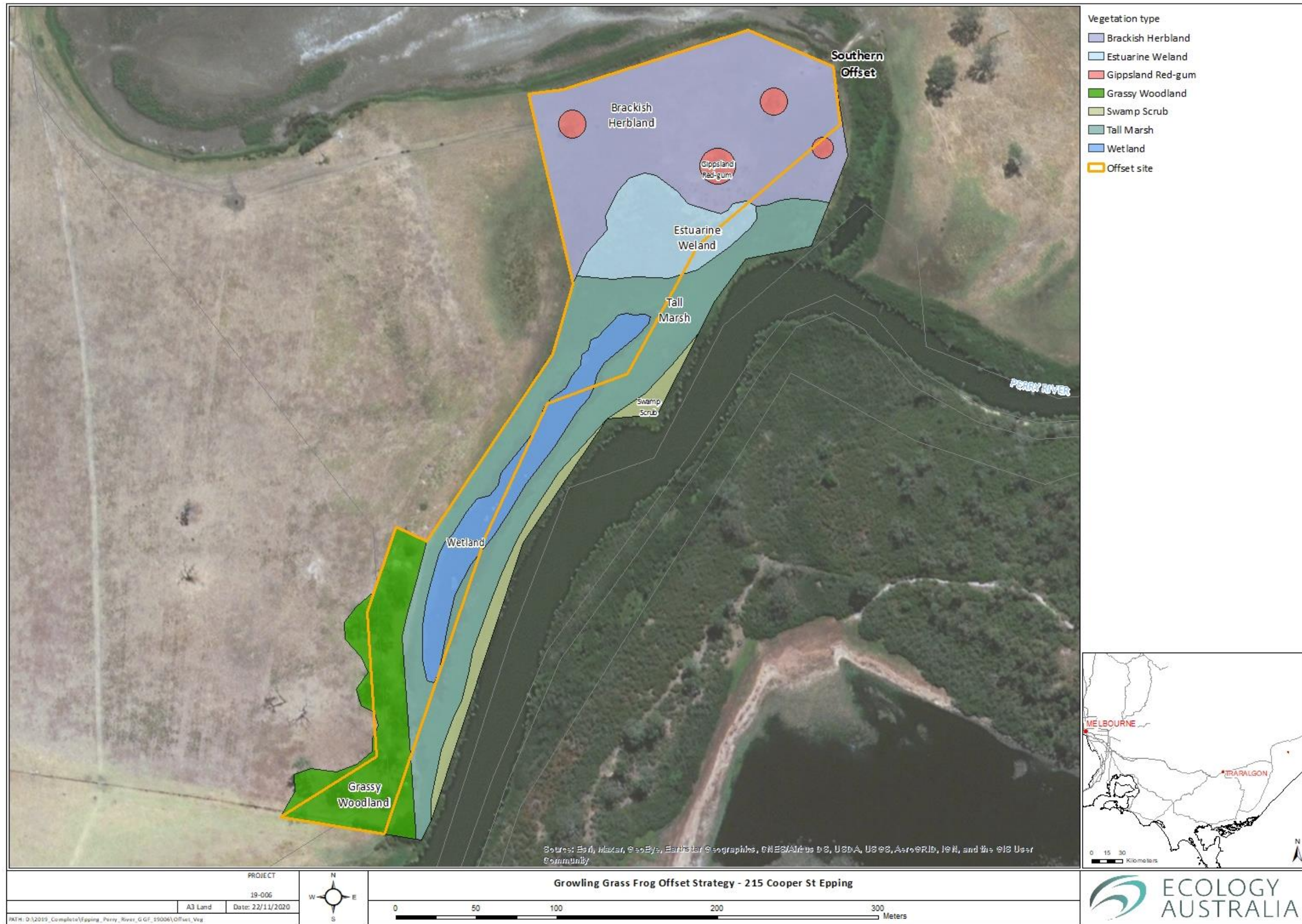


Figure 6 Vegetation types at the proposed southern offset site at 191 Springberg Lane, Parry Bridge.

### 3.3.3 Offset Site Suitability.

The offset site fulfils the requirements outlined in the EPBC Act approval for the New Epping development. Specifically, the site meets the requirements outlined in Condition 3 per the approval dated 24/05/19:

*3. To compensate for the loss of 17.39 ha of **Growling Grass Frog habitat**, the approval holder must implement the **Growling Grass Frog Offset Strategy**, and ensure that a **viable population** of the **Growling Grass Frogs** is maintained at the proposed offset area for 10 years.*

The Offset Strategy (Ecology Australia 2019c) provided as part of the above approval identifies the two sites at 191 Springberg Lane, Perry Bridge as the suitable off-site offset sites.

### 3.3.4 Current permitted land uses

The property is currently zoned as Farming Zone (FZ) within the Wellington Shire Planning Scheme. The purpose of Farming Zone is to provide land for agricultural uses. The farm is currently used to run cattle. The offset sites are also subject to Floodway Overlay (FO) and Land Subject to Inundation Overlay (LSIO); these overlays are unlikely to affect the operation of these sites as biodiversity offsets. A small portion of the southern offset along the bank of the Perry River is covered by an Environmental Significance Overlay (ESO2), which aims to protect and enhance wetlands through the control of development. Again, this overlay is unlikely to impact the operation of these sites as biodiversity offsets, as a permit is not required for works for the protection or restoration of a wetland under the ESO2.

While the removal of vegetation is controlled under clause 52.17 of the Victorian Planning Provisions, some vegetation can be removed without a permit to the minimum extent possible for certain activities. The activities that allow for the removal of vegetation without a permit include the removal of dead vegetation, construction of boundary fences, mowing of understory grasses, removal of pest animal burrows and fire protection. See DELWP (2017c) for further information.

There are no buildings in the proposed offset areas.

Without additional protection, the Growling Grass Frog population on site may be at risk of decline due to current permitted land uses – primarily due to habitat destruction by livestock and the potential for mortality from trampling.

### 3.3.5 Existing offset arrangements

The proposed offset sites are not current designated offset sites under either Victorian policy or EPBC Act Offset Policy.

A 13.25 ha EPBC offset site exists between the two proposed offset sites.



## 4 Offset Site

This section outlines the management actions necessary to implement this OMP and conserve Growling Grass Frog habitat in the offset sites. This OMP details management activities for the 10 year management period and in perpetuity thereafter. This OMP aims to protect and improve Growling Grass Frog habitat through on ground actions, resulting in conservation gains for Growling Grass Frogs on site. Management actions must meet the targets outlined in this OMP.

This OMP will come into force once the covenant is registered

### 4.1 EPBC Act approval conditions

This OMP has been specifically developed to comply with the approval conditions outlined in the approval for the New Epping Development (EPBC 2016/7755). The relevant approval conditions are outlined in Table 2.

**Table 2 EPBC approval conditions for the New Epping development.**

Condition	Condition details	OMP Actions	OMP section
3	To compensate for the loss of <del>17.39</del> ha of <b>Growling Grass frog habitat</b> , the approval holder must implement the <b>Growling Grass Frog Offset Strategy</b> , and ensure that a <b>viable population</b> of the <b>Growling Grass Frogs</b> is maintained at the proposed offset areas for 10 years.	Offsets secured	4.4
4	Prior to the <b>commencement of the action</b> , the approval holder must prepare Offset Management Plans for the onsite and offsite offset areas proposed in the <b>Growling Grass Frog Offset Strategy</b> . The approval holder must not <b>commence the action</b> until both Offset Management Plans have been prepared. The Offset Management Plans must be provided to the <b>Department</b> within 14 days the Offset Management Plans being prepared. Each approved Offset Management Plan must be implemented for the life of the approval. Each Offset Management Plan must:	This report	NA
4a	Be prepared by a <b>suitably qualified expert</b>	Report written by suitably qualified and experienced ecologists.	NA
4b	Be prepared in accordance with the principles of the <b>EPBC Act Environmental Offsets Policy</b> , and be consistent with the <b>Growling Grass Frog Offset Strategy</b>	Yes	NA
4c	Include timelines and mechanisms for <b>legally securing</b> the offset area(s)	TFN Covenant	4.4
4d	Provide a written description and a map that clearly defines the location and boundaries of the offset area(s). This must be accompanied by the offset <b>attributes</b> and <b>shapefiles(s)</b>	Description of site and map provided. Shapefiles attached separately	3.3
4e	Include a description, based on adequate surveys, of the current <b>Growling Grass Frog</b> population within each offset area, and the condition (prior to any management activities) of each	Site description including current Growling Grass Frog population and	3.3

Condition	Condition details	OMP Actions	OMP section
	offset area, including existing habitat (the baseline conditions)	habitat included.	
4f	Detail timeframes, management actions, and strategies for: <ul style="list-style-type: none"> <li>i) maintaining a <b>viable population</b> of <b>Growling Grass Frogs</b> within the onsite offset; and</li> <li>ii) for the creation, regeneration and/or revegetation of <b>Growling Grass Frog habitat</b> within the proposed onsite and offsite offset areas.</li> </ul>	Management actions outlined to preserve and improve the Growling Grass Frog population and habitat on site	5
4g	Management actions and strategies must include: <ul style="list-style-type: none"> <li>i) performance and completion criteria for evaluating the management of the offset area, and criteria for triggering remedial action and contingency responses</li> <li>ii) a program to monitor and report on the effectiveness of these measures, and progress against the performance and completion criteria</li> <li>iii) a description of potential risks to the successful implementation of the plan, a description of the measures that will be implemented to mitigate against these risks and a description of the contingency measures that will be implemented if defined triggers arise</li> <li>iv) specify the timing and frequency of management actions, reporting and implementation of contingency responses and corrective actions, and the person/s responsible</li> </ul>	Management actions with performance criteria outlined to preserve and improve the Growling Grass Frog population and habitat on site. Monitoring and reporting program included. Risk assessment completed. Management responsibilities outlined Potential corrective actions outlined	4.2, 5, 6, 8, 9, 10
6	Within three (3) months following the third and fourth anniversary of the <b>commencement of the action</b> , the approval holder must provide a report demonstrating that a <b>viable population</b> of <b>Growling Grass Frog</b> has been maintained at the onsite offset site (as required under the <b>Growling Grass Frog Offset Strategy</b> ). The report must be prepared by a <b>suitably qualified expert</b> .	Annual Growling Grass Frog monitoring reports will meet this requirement	9
7	If the <b>Minister</b> is not satisfied that a <b>viable population</b> of <b>Growling Grass Frog</b> has been maintained, as required in condition 6, the <b>Minister</b> may (in writing) require the approval holder to submit a new plan or program for the <b>Minister's</b> approval to reduce, mitigate, remediate or compensate impacts to <b>Growling Grass Frogs</b> . If the <b>Minister</b> approves the plan or program, then the approved plan or program must be implemented. <i>Note: To avoid doubt, any proposed compensation measures must be additional to that required by the <b>Growling Grass Frog Offset Strategy</b>.</i>	Potential corrective actions included in management actions OMP review as required.	5, 9.3
10	All management plans required under this approval should be prepared in line with the <b>Department's Environmental Management Plan Guidelines</b> .	OMP follows guidelines.	NA
11	The approval holder must maintain accurate and complete <b>compliance records</b> .	Reporting schedule included	9
15	The approval holder must prepare a <b>compliance report</b> for each 12 month period following the date of <b>commencement of the action</b> , or as otherwise agreed to in writing by the <b>Minister</b> .	Reporting schedule included	9

Condition	Condition details	OMP Actions	OMP section
16	<p>The approval holder must notify the <b>Department</b> in writing of any: <b>incident</b>; non-compliance with the conditions; or non-compliance with the commitments made in <b>plans</b>. The notification must be given as soon as practicable, and no later than two <b>business days</b> after becoming aware of the <b>incident</b> or non-compliance. The notification must specify:</p> <ul style="list-style-type: none"> <li>a. the condition which is or may be in breach; and</li> <li>b. a short description of the <b>incident</b> and/or non-compliance.</li> </ul>	<p>Incident reporting section provided, with relevant emergency contacts.</p>	10
17	<p>The approval holder must provide to the <b>Department</b> the details of any <b>incident</b> or non-compliance with the conditions or commitments made in <b>plans</b> as soon as practicable and no later than <b>10 business days</b> after becoming aware of the <b>incident</b> or non-compliance, specifying:</p> <ul style="list-style-type: none"> <li>a. any corrective action or investigation which the approval holder has already taken or intends to take in the immediate future;</li> <li>b. the potential impacts of the incident or non-compliance; and</li> <li>c. the method and timing of any remedial action that will be undertaken by the approval holder.</li> </ul>	<p>Incident reporting section provided, with relevant emergency contacts.</p>	10
18	<p>The approval holder must ensure that <b>independent audits</b> of compliance with the conditions are conducted for the 12 month period from <b>commencement of the action</b> and for every subsequent 24 month period until this approval expires, or as requested in writing by the <b>Minister</b>.</p>	<p>Audit reporting schedule reflects condition</p>	9.2
21	<p>The approval holder may, at any time, apply to the <b>Minister</b> for a variation to an action management plan approved by the <b>Minister</b> under condition 4, or as subsequently revised in accordance with these conditions, by submitting an application in accordance with the requirements of section 143A of the <b>EPBC Act</b>. If the <b>Minister</b> approves a revised action management plan (RAMP) then, from the date specified, the approval holder must implement the RAMP in place of the previous action management plan.</p>	<p>OMP review process outlined.</p>	9.3

Refer to update #13

Note that a **viable population** means a self-supporting population of **Growling Grass Frog** with documented breeding and ongoing recruitment into the population, and sufficient numbers and genetic variety in a particular area, determined from baseline data.

## 4.2 Offset site details

The offsite offset will consist of two sites. The details of these land parcels, including the details of the landowner, location, allotment and location government area are shown in Table 3.

## 4.3 Offset strategy

The offset will be secured and managed for Growling Grass Frog conservation in perpetuity. The offset sites cover a portion of the property at 191 Springberg Lane, Perry Bridge; the remainder of the property consists of farmland and existing offset sites.

There are no easements in the proposed offset sites, and future offsets will not be applied as they will likely go against the objectives of the offset sites and this OMP. There are no existing offset sites within the proposed offset sites, either under the EPBC Act offset policy or Victorian offset policy. There are additional offset sites elsewhere on the property at 191 Springberg Lane, Perry Bridge.

## 4.4 Offset security, management responsibilities and reporting requirements

The proposed offset sites are located within a larger property at 191 Springberg Lane, Perry River. The property is owned by Robert Cromb. Riverlee has negotiated an agreement with the landowner (and any future landholders) to manage the offset sites for the duration of this OMP.

**Table 3 Offset site details**

<b>Landowner</b>	Robert Cromb
<b>Type of Offset</b>	Third party
<b>Address of Offset</b>	191 Springberg Lane, Perry Bridge, Victoria, 3862
<b>Allotment</b>	Lot 1 of PS818354
<b>Standard Parcel Identifier</b>	1\PS818354
<b>Volume/Folio</b>	8271/409
<b>Local Government Area</b>	Wellington Shire
<b>Council Property Number</b>	97915
<b>Bioregion</b>	Gippsland Plains

The offsite site will be secured and managed for conservation in perpetuity with a covenant as per Section 3A of the *Victorian Conservation Trust Act 1972*. A Trust for Nature (TfN) covenant will be registered on the offset sites in 2019 or 2020. This OMP outlines the management actions, monitoring and reporting required at the offset site. The covenant registered on the title requires the property owners (and future property owners) to manage the property in accordance with this OMP and any future revisions. Details of the offset security and management action roles and responsibilities are outlined in Table 4.

**Table 4 Security, management, monitoring and reporting requirements for the offset sites**

Responsible/liable for meeting offset requirements	Riverlee (or subsequent EPBC Act approval holder)	
Security	A covenant as per Section 3A of the <i>Victorian Conservation Trust Act 1972</i>	
Date of commencement for the covenant	2019/2020 (exact date to be confirmed, however the covenant is expected to register during 2019)	Refer to update #14
Start date for 10 year management period	2020 (exact date to be confirmed, but to be linked to the completion of the new onsite habitat at 215 Cooper Street, Epping so the 10 year management period for the two sites is the same)	Refer to update #15
End date for 10 year management period	10 years from the start date for the management period.	
Date the agreement is registered on the title	2019/2020 (exact date to be confirmed)	Refer to update #16
Responsibility for management and monitoring of offset site	Robert Cromb (or subsequent landholder)	
Auditing	Riverlee (or subsequent EPBC Act approval holder)	
Reporting responsibility to Trust for Nature	Robert Cromb (or subsequent landholder)	
Reporting responsibility to DoEE	Riverlee (or subsequent EPBC Act approval holder)	
OMP review	Riverlee (or subsequent EPBC Act approval holder)	

The covenant will state the in perpetuity and 10 year management plan land use commitments across the offset site as follows:

- Develop an annual works plan based on prevailing conditions.
- Construct and maintain fences to exclude domestic stock from the offset sites.
- Retain and manage native vegetation as outlined in this OMP.
- Eliminate any woody weeds and control other high threat weeds so that cover does not exceed levels reached at the end of the 10 year management period.
- Monitor for new and emerging high threat weeds, and control so that cover does not exceed 1%.
- Retain all fallen timber and litter.
- Ensure that pest animals are controlled, and that numbers of pest animals do not exceed the number reached at the end of the 10 year management period.
- Do not conduct pasture improvement, cultivation, cropping or fertilising in the offset areas.
- Ensure that the cover of shrubs and trees >5 m tall does not exceed 10% for the offset sites as a whole, or for each individual wetland.



- Monitor Growling Grass Frog abundance at the offset site twice per breeding season every year for the 10 year management period. Thereafter Growling Grass Frog monitoring will be conducted as requested.
- Monitor salinity levels in each of the wetlands for the 10 year management period.

These management actions are outlined in more detail in Section 5 and Table 6. Management actions following the 10 year management period are outlined in Section 5.12 and Table 7.

The land owner (Robert Cromb or any future landholder) has the overall responsibility for implementing this OMP. Direct management responsibility may be delegated to another party (e.g. a site manager or ecologist). A suitably qualified ecologist must be engaged to conduct Growling Grass Frog population and habitat monitoring, with reports to be submitted to Riverlee (or subsequent EPBC Act approval holder), DoEE and the TfN.

Trust for Nature will oversee management of the site by the landowner. The TfN has responsibility for:

- Providing input into the annual works program.
- Undertaking site inspections at least four times over the 10 year management period.
- Review monitoring program to determine if targets are being achieved.
- Verify that this OMP is being effectively implemented.

A funding agreement has been reached between the landowner, Riverlee and the TfN to ensure this OMP will be implemented. As per the agreement, funding will be held by the TfN and paid to the landowner over the course of the 10 year management plan.

## 4.5 Environmental outcomes to be achieved

The key environmental outcomes to be achieved as a result of establishing the offset site are:

- Legal protection of 6.9 ha of Growling Grass Frog habitat in perpetuity.
- Improve the condition of Growling Grass Frog habitat on site, as measured by ongoing monitoring of the on-site Growling Grass Frog population and habitat quality monitoring.
- Physical protection of the offset sites with fencing to reduce the impacts of threats such as cattle, pest species and weeds.

### 4.5.1 Future condition goals

Future condition goals will be guided by the habitat features preferred by Growling Grass Frogs, namely:

- Permanent or near permanent wetlands supporting areas of open water with a high cover of submergent and floating vegetation.
- Areas of emergent fringing vegetation and also more open areas surrounding wetlands.
- Terrestrial habitat dominated by grasslands.
- Rocks and or logs for calling, perching, basking and overwintering
- Low cover (<10%) of shrubs and trees >2 m tall.
- Salinity <7 mS/cm.

Habitat will be managed to maintain and/or improve habitat features preferred Growling Grass Frog features as outlined above.

The density of fringing shrubs and trees will be monitored and controlled to ensure that the wetlands are not subject to high shading. If the cover of shrubs and trees >2 m tall within 10 m of wetlands exceeds 20%, this cover should be reduced to <10%. Elsewhere in the offset sites, cover of trees and shrubs should be kept below 50%; if cover exceeds 50%, it should be reduced to <20%.

Water quality at the offset sites will also need to be managed. At the northern offset site the causeway at the downstream end of the drainage depression will have its pipe removed and will be raised – water will then backfill the drainage depression, creating more wetland habitat on site. Low areas along the banks of the Perry River at the southern offset site will be built up to reduce the incidence of salt water intrusion at this site. Both of these measures will also reduce the likelihood of predatory fish entering the wetlands.

Salinity levels on site will fluctuate due to rainfall, evaporation, and freshwater and more saline inputs. Over the peak breeding season (late spring and early summer), salinity will aim to be below 7 ms/cm, as this appears to be the approximate maximum salinity inhabited long-term by the species (Cleemann and Gillespie 2012; Ecology Australia 2017b). However, salinity at the main wetland at the southern offset will be dependent on prevailing conditions, as it is fed primarily by surface flows and inputs from the Perry River. On wet years, water quality will likely be well below 7 ms/cm and on dry years well above 7 ms/cm. At the northern offset site, salinity is likely to be below 7 ms/cm even in very dry years, particularly at the raised spring fed soak. Water quality data from the northern offset site in 2019 after three years of drought in the region, found that conductivity was 0.8 ms/cm at the spring fed soak and 4.22 ms/cm at the constructed wetland that the spring-fed soak flows into (Ecology Australia in prep).

Data on the Growling Grass Frog population at the proposed offset site is currently unavailable; surveys conducted at the northern offset sites in 2019 recorded Growling Grass Frog at the northern offset (Turner 2019), but not at the southern offset (Ecology Australia, in prep). However conditions on site were poor due to the ongoing drought in the region and the presence of cattle in the northern offset. Anecdotal evidence suggests that Growling Grass Frogs are present at the southern site when conditions are favourable (R Cromb Pers. Comm.). In addition, surveys in 2019 recorded Growling Grass Frogs at the existing offset site. Ongoing monitoring on site will reveal the size of the Growling Grass Frog population at the proposed offset sites.

#### 4.5.2 Performance and completion criteria

Key performance and completion criteria are:

- Establishment of legal protection in perpetuity (Section 4.4).
- Increase wetland habitat on site (Section 5.2)
- Maintain native vegetation in the offset sites to provided habitat conditions preferred by Growling Grass Frog (sections 4.5.1, 5.6 and 5.9).
- Maintain water quality in wetlands as far as practical (i.e. when conditions are good) (Sections 5.7).
- Control threats on sites, including stock grazing, pest species, weeds, woody plants and salt water incursion (Sections 5.1, 5.4 and 5.5).

- Complete scheduled management actions, monitoring, reports and audits (Sections 8 and 9).

#### **4.6 Limitations**

This OMP is based on site visits from site visits in mid-2018 (Ecology Australia 2019c) and early 2019 (Ecology Australia, In Prep). Conditions on site at this time were atypical of long term conditions, as much of Gippsland is in drought due to more than three years of well below average rainfall. Conditions on site are likely to be significantly different in average years and the quality and extent of Growling Grass Frog habitat are likely to be much higher.

Due to the current poor conditions on site as a result of drought conditions and stock in the proposed offset sites, the status Growling Grass Frog population size in the proposed offset site is currently uncertain. However Growling Grass Frog are known from the northern offset site (Turner 2019) and anecdotal evidence suggests that Growling Grass Frog are abundant at the southern offset under normal and wet conditions (R Cromb Pers. Comm.).

## 5 Management actions

This section presents the management actions required to satisfy the requirements of the EPBC Act approval conditions. Management actions described below are to be implemented for a period of 10 years in accordance with the EPBC Act approval conditions. Following the 10 year management period, the site will continue to be managed by the landholder in perpetuity.

The offset site will be managed to preserve the local Growling Grass Frog population and improving Growling Grass Frog habitats on site. Habitat will be improved primarily by excluding stock, controlling salinity, improving terrestrial habitat and increasing wetland area. The site will be managed in accordance with EPBC Act approval conditions.

From the commencement of this agreement, the land owner/manager will undertake the following management actions within the offset sites in perpetuity:

- Permanently fencing off offset sites to exclude stock.
- Maintaining the existing freshwater spring fed soak at the northern offset site as a habitat refuge for Growling Grass Frog. Overflow from this soak will be used to establish additional wetlands at the northern offset site.
- Increasing the area of Growling Grass Frog wetlands in offset sites, in particular the northern offset site.
- Potentially building up low areas along the banks of the Perry River adjacent to offset sites to reduce salt water incursion.
- Improving the causeway at the northern offset site to reduce saltwater intrusion, and provide additional wetland habitat.
- Control weeds on site by ensuring that:
  - Cover of weeds does not increase beyond that currently present on site.
  - Cover of high threat weeds does not exceed 1%
  - Woody weeds are eliminated on site.
  - Monitoring is conducting so any new and emerging high threat weeds are recorded and eliminated as required.
- Controlling Red Foxes (*Vulpes vulpes*), European Rabbits *Oryctolagus cuniculus*), Hares (*Lepus europaeus* and *L. capensis*) and deer species, and destroying any dens or warrens found on site.
- Monitoring and controlling new and emerging pest animals.
- Monitoring the regeneration of tree and shrub species to prevent a dense stand of vegetation forming that shades wetland is less preferable for Growling Grass Frogs. Vegetation should be managed as follows:
  - Within 10 m of wetlands, cover of shrubs and trees >2m tall should be kept below 20%.
  - >10m from wetlands, cover of trees and shrubs >2m tall should be kept below 50%.
  - Cover of trees and shrubs over 5 m tall should be kept below 10%.

- Retaining fallen timber.

Management actions are expanded below and a summary and schedule shown in Table 6.

Management of the site is underpinned by adaptive management. The nature and timing of actions should be adaptable, changing as prevailing conditions vary, new threats emerge, new management techniques are developed and additional information becomes available about the ecology of Growling Grass Frogs. This will allow management to improve and respond to changing conditions and new information.

## 5.1 Fencing

While the offset sites are largely already fenced, fences will be maintained, gates kept closed and fencelines extended as required. Fence lines will exclude a variety of threats including livestock and unauthorised vehicles. Livestock and vehicles have the capacity to kill or injure frogs, damage and destroy vegetation, disturb and compact soil, and introduce weeds and pathogens. By installing fences where required, keeping gates closed and maintaining fencelines these threats will be excluded from the site in perpetuity.

The southern offset site is currently fully fenced. The northern offset site will require one of the existing fencelines to be moved; the northern fenceline will need to be moved approximately 20 m to the north to encompass the entire offset area. Fencelines will be built and maintained over the 10 year management period in accordance with management standards (DSE 2009b).

Monitoring of threats will be ongoing; fences around the two offset site will be maintained in good condition and upgraded as required to control ongoing threats.

### Management actions

- Offset sites fenced in accordance with management standards (DSE 2009b).
- Gates kept closed at all times.
- Fences regularly inspected and repaired as necessary

### Performance criteria

- Livestock and unauthorised vehicles excluded from the offset area.

### Potential corrective actions

- Increase rate of fence inspections.
- Replace old fences.
- Change fence design to exclude new and emerging threats.

## 5.2 Increasing wetland area

There are opportunities to increase the wetland habitat available at each offset site, thereby improving the habitat for Growling Grass Frogs.

At the southern offset site, some (at least 3) small wetlands can be constructed, particularly to the north of the existing wetland (Figure 7). These will capture surface flows before they enter the main wetland



and provide ephemeral freshwater habitats that may be less saline than the main wetland at this site, not contain predatory fish species and have low incidence of chytrid fungus due to regular drying out. These smaller wetlands will also be refilled after smaller rainfall events than required to refill the main wetland at the southern offset.

In the northern offset site, two additional wetlands will be constructed to capture overflow from the freshwater soak present. Immediately adjacent to the existing raised soak, a perched wetland will be constructed, which will be fed by overflow from the existing soak (Figure 8). The perched wetland will create a permanent habitat similar to that in the existing soak (e.g. similar size and depth), and will be beneficial as it will be:

- Protected from salt water intrusions from the Perry River.
- >1.5 m deep, allowing for a high cover of floating and submergent vegetation. As it will be perched, it can be deep without potentially intercepting saline seepage from the Perry River.
- Protected from predatory fish that may enter wetlands from the Perry River.

The causeway at the northern offset site will also be modified to increase the area of wetland habitat at this northern site (Figure 8). The pipe that allows water to flow under the causeway will be removed, the causeway raised slightly, and a slightly lower strengthened overflow area will be constructed. This will allow the area upstream of the causeway to backfill with a combination of overflows from the existing soak and overland flows along the drainage depression that flows through the offset site. This will create a second additional large area of wetland habitat, which can be altered by lowering or raising the causeway as required. This will also backfill the recently constructed waterbody.

The exact location of these new constructed wetlands will be finalised based on the landholder's knowledge of the landscape and overland flows, and to avoid impacts to native vegetation as much as possible. Based on conversations with the landholder, indicative locations are likely very similar to the final location of the wetlands.

When constructing wetlands, the removal of native vegetation will be avoided if possible. If it is necessary to remove, destroy or lop native vegetation, then a permit may be required under Clause 52.17 of the Wellington Planning Scheme. Under Clause 52.17, an application to remove, destroy or lop native vegetation must comply with the application requirements specified in the Guidelines for the removal, destruction or lopping of native vegetation (the Guidelines). The Guidelines are incorporated into all Victorian planning schemes. In addition, the removal or damage of native vegetation will require pre-approval by Trust for Nature to temporarily waive the relevant provisions of the Conservation Covenant.

### Management actions

- At southern offset site, construct at least 3 small wetlands as outlined in Figure 7 to capture surface runoff.
- At the northern offset site:
  - Construct a small, deep perched wetland adjacent to the existing soak to be fed by overflow from the existing soak.
  - Remove the pipe that allows flow under the causeway, raise the causeway and create a slightly lower, strengthened area to allow for overflows. This will allow the area

upstream of the causeway to backfill due to overflow from the existing soak and overland flows, creating a large area of wetland habitat.

- Wetlands to be constructed to minimise damage to Growling Grass Frog habitat, such as construction using a long armed excavator from outside the offset and avoiding dense vegetation where Growling Grass Frogs may be sheltering. Where vegetation may be impacted, pre clearance searches and relocation may be required.

#### Performance criteria

- Construct at least 3 wetlands in the southern offset, and 1 wetlands at the northern offset site and modify the causeway so water backfills upstream from it.

#### Potential corrective action

- Construct additional wetlands.

### 5.3 Maintain existing soak

The existing spring fed soak at the northern offset site will be maintained in its current form. That is with dense fringing vegetation and areas of submergent and floating vegetation. However, if it becomes clogged with emergent and fringing vegetation or sediment, some vegetation and/or sediment should be removed.

Refer to update #17

#### Management actions

- Maintain the existing conditions in the existing soak at the northern offset site.

#### Performance criteria

- The existing soak at the northern offset site will be maintained in its current form, with dense fringing vegetation and areas of submergent and floating vegetation.

#### Potential corrective action

- ~~Remove emergent vegetation and or sediment if the wetland becomes clogged with vegetation or full of sediment.~~

Refer to update #18



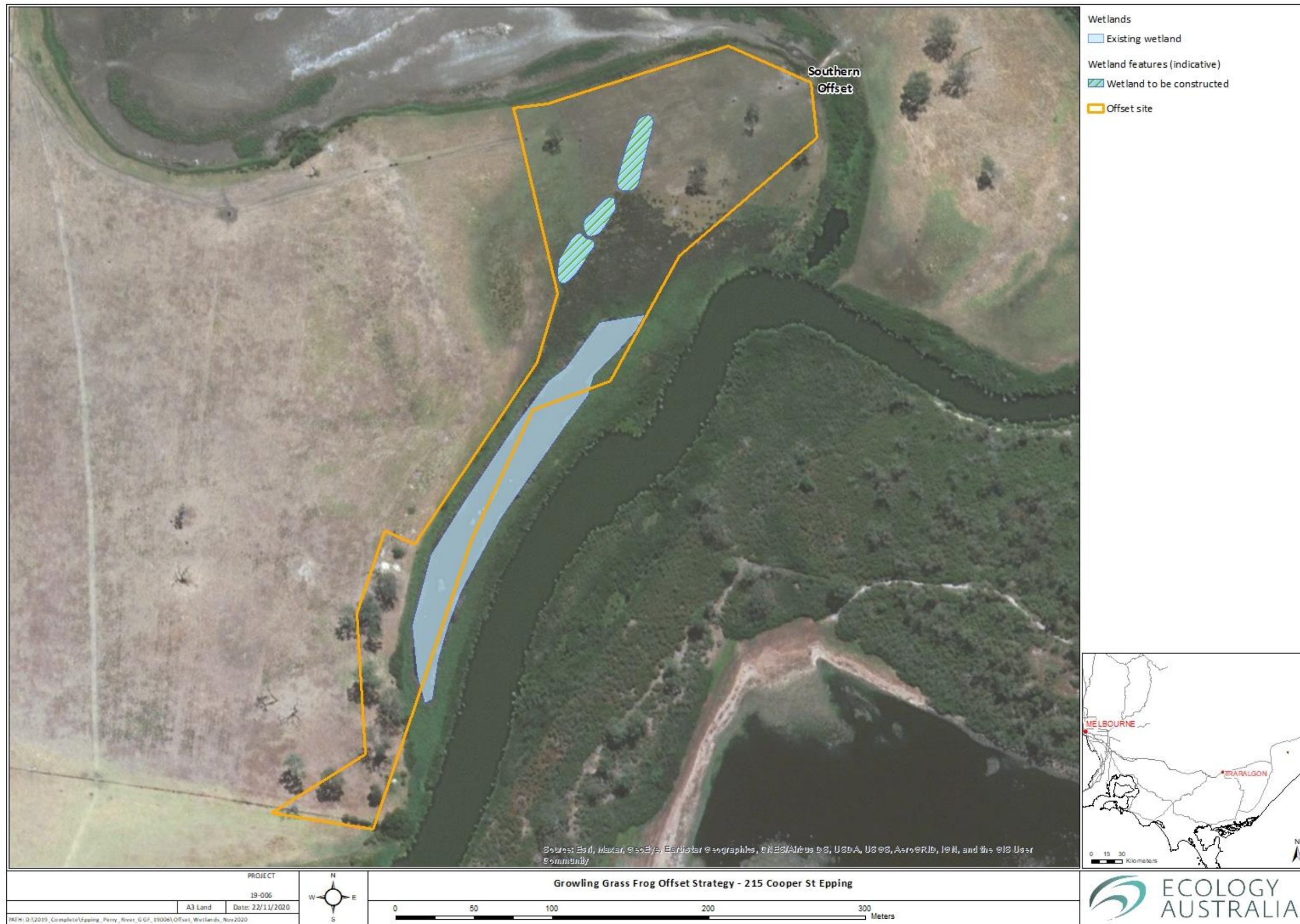


Figure 7 Indicative location of the existing wetland and proposed small wetlands at the southern offset site.





Figure 8 Indicative location of the existing soak, new wetland, proposed perched wetland and the causeway at the northern offset site



## 5.4 Weed management

Weeds will be managed on site. Woody weeds and herbaceous weeds will be subject to different management actions and performance criteria. The offset sites will be regularly inspected for weeds, and new and emerging weeds will be added to the monitoring program as necessary.

### 5.4.1 Herbaceous weeds

High threat herbaceous weeds will be controlled on site: the control of weeds on site is one of the key management actions to improve habitat present on site. The only high threat herbaceous weed recorded at the offset sites was Tall Wheat Grass *Lophopyrum ponticum*. This was recorded at the southern offset site in rushes to the north of the existing wetland.

The Victorian *Catchment and Land Protection Act 1994* (CaLP Act) lists noxious weeds, and requires that landholders take reasonable steps to control and manage high threat weeds present on their land, to prevent their spread and, where possible, eradicate them. All high threat weeds will be managed to ensure that cover does not increase beyond current levels, but preferably so that weed cover declines. High threat weeds known from the offset sites are outlined in Table 5; these weeds will be monitored annually to ensure that their cover is not increasing. In areas where cover has increased or infestations are present, the weeds will be controlled as outlined in Table 5 or as approved by the TfN.

The high threat weeds will be treated before they flower and have gone to seed. The impacts of control actions will be kept to a minimum. Mechanical or hand removal of weeds will be the preferred control method. Herbicides will only be used where mechanical/hand removal is not possible or practical. Residual herbicides will not be used. Where non-residual herbicides are used, they will be used sparingly and their impacts to amphibians reduced as much as possible by using less toxic herbicides (e.g. Roundup Biactive), by using wet wiping rather than spraying, and not spraying immediately adjacent to wetlands (DSE 2012a).

Ongoing monitoring will be conducted annually in spring for the 10 year management period, and any new and emerging weeds will be eliminated. Weeds to be controlled include high threat weeds listed under the CaLP Act, and any other weeds that may be considered high threat on site.

**Table 5 High threat weeds recorded onsite to be controlled, and how and when to control the weeds.**

Scientific Name	Common name	Control method	Timing for control
<i>Lophopyrum ponticum</i>	Tall Wheat-grass	Remove manually or spot spray with an appropriate herbicide	Remove manually at any time, spot spray in spring
<i>Rubus fruticosus</i> spp. agg.	Blackberry	Cut and paint, with manual removal of seedlings.	Remove immediately when recorded

### Management actions

- Monitor and control high threat weeds on site annually in spring to ensure that the cover of high threat weeds does not increase. Baseline weed cover will be established during the first year of monitoring following the establishment of the offset site.
- Monitor and eliminate new and emerging weeds

- When controlling weeds, use mechanical or hand removal as much as possible.

#### Performance criteria

- Cover of high threat weeds does not increase, and preferably cover declines.
- New and emerging high threat weeds do not establish on site.

#### Potential corrective action

- Increase rate of monitoring and controlling high threat weeds.
- Improve timing of control actions, so weeds are controlled before they set seed.

### 5.4.2 Woody weeds

All woody weeds present on site will be eliminated.

The only woody weed identified on site is blackberry *Rubus fruticosus* spp. agg., which has been recorded adjacent to the soak at the northern offset site and the existing offset site. Blackberry have the potential to spread rapidly across the site, therefore attempts must be made to eliminate it quickly.

Within the first year of this OMP commencing, blackberry infestations in the offset sites must be controlled. Control will initially consist of mechanical removal of plants, and then any subsequent recruits controlled using a non-residual herbicide with a lower toxicity for aquatic organisms (e.g. RoundUp BiActive). Herbicide application should preferably be via wick wiping to reduce off target impacts. If herbicides must be sprayed, they should only be applied during calm days and not within 2 m of waterways. Any subsequent blackberry recruits encountered will have their location recorded, and will be controlled prior to going to seed.

Refer to  
update #19

~~Monitoring of weeds will be conducted annually in spring.~~ Other woody weeds encountered on site will be eradicated using the appropriate methodology. To minimise off target impacts to fauna and indigenous flora, woody weeds will be controlled using physical removal where possible. Any use of herbicides will be kept to the bare minimum, with wick wiping being preferred to spraying and only non-residual, less toxic herbicides (e.g. RoundUp BiActive) will be used. Areas where woody weeds were previously recorded and controlled will be revisited and monitored for regeneration, and any regeneration will be controlled.

#### Management actions

- Monitor the site for weeds annually in spring.
- Eradicate woody weeds encountered on site prior to them setting seed.
- Where possible, physical removal should be the favoured method of control.
- Herbicides use should be avoided where possible. When used, herbicides should be applied:
  - Using wick wiping rather than spraying as much as possible.
  - Using non-residual herbicides with reduced toxicity to aquatic animals (e.g. RoundUp BiActive)
  - More than 2 m from water bodies.

- Areas where woody weeds were controlled should be regularly inspected for regrowth, and any regrowth controlled before setting seed.

#### Performance criteria

- No woody weeds present at offset sites.

#### Potential corrective action

- Increase rate of monitoring and controlling woody weeds.
- Improve timing of control actions, so weeds are controlled before they set seed.

## 5.5 Pest animals

Red Foxes (*Vulpes vulpes*), European Rabbits *Oryctolagus cuniculus*), Hares (*Lepus europaeus* and *L. capensis*) and deer species (Hog Deer *Axis porcinus*) are all known to occur on site and should be controlled. The CaLP Act lists hares, rabbits and foxes as established pest species and landholders are required to take reasonable steps to control and eradicate established pest species on their land. Hog deer are considered 'wildlife; under the *Wildlife Act 1975*. Under the *Wildlife (Game) Regulations 2012*, a permit from DELWP is required to control Hog Deer on private land. Pest fauna at the offset site and within 500 m of the offset site (on the land holders land) will need to be controlled.

Rabbits and hares degrade habitats. Rabbits and hares will be monitored biannually in spring and autumn at the same time as habitat monitoring, and controlled where found. If rabbits are found on site, an integrated approach using fumigation, hand collapsing of burrows and baiting will be used to control rabbits (DSE 2012b). Carcasses will be removed to prevent native predators being poisoned.

Foxes predate upon native fauna including Growling Grass Frogs (DEWHA 2009a). Foxes will be controlled if recorded at the property. If found, fox dens will be destroyed via fumigation followed by hand collapse.

Deer species including Hog Deer species should be controlled on site. Deer species except for Hog Deer can be controlled on private property without a permit. Controlling Hog Deer on private property requires an Authority to Control Wildlife Permit from DELWP.

In addition to terrestrial pest species, predatory fish species (both native and introduced) have the capacity to reduce habitat quality. Predatory fish may consume eggs, tadpoles and adult Growling Grass Frogs and Green and Golden Bell Frogs. Fish have not been recorded in the wetlands at the offset site. Fish will continue to be excluded from these wetlands – improving the causeway at the northern site and building up low areas along the riverbank at the southern offset site will reduce the likelihood of fish colonising wetlands. However, if wetlands are found to be colonised by predatory fish, they will be allowed to dry out naturally by diverting spring waters. However, only 50% of wetlands at an offset site will be allowed to dry out in a single year.

Monitoring will also be used to identify new and emerging pest species. New pest species identified on site will be controlled.

#### Management actions

- Pest animals will be monitored and controlled at the offset sites and within 500 m of the offset sites.

- Rabbit warrens and fox dens will be fumigated and hand collapsed. Carcasses will be disposed of to prevent native wildlife being poisoned.
- Deer will be controlled onsite.
- Predatory fish will be excluded from wetlands, and if colonised wetlands will be allowed to dry out.

#### Performance criteria

- Foxes, rabbits and hares not present within 500 m of offset site.
- Deer are kept at low abundance.

#### Potential corrective action

- Increase the rate of monitoring and control of pest species.

### 5.6 Native tree and shrub recruitment

A dense cover of shrubs and trees that overshadows wetlands and removes open areas of terrestrial habitats would reduce habitat quality for Growling Grass Frogs. It is likely that the history of grazing at the offset sites has suppressed the establishment of trees and shrubs in the offset area. As a result, it is possible that dense stands of native vegetation (such as Swamp Paperbark *Melaleuca ericifolia*) may become established after grazing is excluded, as per example as is currently occurring in Brackish Herbland EVC (see section 3.3.1).

Recruitment of trees and shrubs should be controlled where required. Cover should be controlled depending on distance from wetlands and size of trees and shrubs as follows:

- Within 10 m of each wetland, cover of trees and shrubs over 2 m should be kept below 20%. If cover exceeds 20%, cover of shrubs and trees should be reduced to <10%.
- More than 10 m from wetlands, cover of trees and shrubs over 2 m should be kept below 50%. If cover exceeds 50%, cover of shrubs and trees should be reduced to <20%.
- Cover of trees over 5 m tall should not exceed 10% throughout each offset site.

The removal or damage of native vegetation will require pre-approval by Trust for Nature to temporarily waive the relevant provisions of the Conservation Covenant.

#### Management actions

- Control shrubs and trees over 2 m as outlined above.

#### Performance criteria

- Cover of shrubs and trees >2m tall should be kept below 20% within 10 m of wetlands and below 50% more than 10 m from wetlands
- Cover of trees and shrubs >5m should be kept below 10% at each offset site.



### Potential corrective action

- Increase monitoring and control efforts to keep cover of trees and shrubs below performance criteria.

## 5.7 Salinity

Salinity will vary depending on prevailing conditions on site, particularly at the southern offset site. Water quality tolerances and preferences for Growling Grass Frogs are poorly known (DELWP 2017a), however, recent studies have revealed that, whilst Growling Grass Frog are likely to tolerate a range of water conditions (Ashworth 1998; Pyke 2002; Hamer *et al.* 2002), frogs generally prefer water bodies possessing low levels of nutrients and salinity levels for successful breeding and recruitment to occur (Ashworth 1998; Organ 2002, 2003, 2005; Hamer and Organ 2006). Growling Grass Frog appear to breed in waters up to a moderate levels of salinity (up to 7000  $\mu\text{S}/\text{cm}$ ) (Ecology Australia 2017b; a). Moderate salinity may be beneficial to Growling Grass Frogs due to suppression of Chytrid (Stockwell *et al.* 2015).

### 5.7.1 Southern offset site

At the southern offset site, the main wetland is fed primarily by a combination of surface flows from the surrounding landscape and inputs from the Perry River. During wetter periods this wetland will be fresher, as freshwater surface flows will fill the wetland and any inflows from the Perry River will be less saline. However during drier periods this wetland will become increasingly saline, as surface flows are reduced, the salinity of the Perry River (and therefore any inflows from the river) will likely increase, and salinity will also increase from evaporation.

Refer to update #20

Salinity at the southern site will be controlled by potentially increasing the bank height in lower areas along the banks of the Perry River to reduce saline inflows during dry periods. To minimise impacts to vegetation, this could be achieved by using a long arm excavator from the unvegetated section of the wetland. In addition, at least 3 small wetlands will be constructed adjacent to the main wetland to intercept surface flows and create additional freshwater habitats in the offset site that are less subject to inflows from the Perry River.

### Management actions

- Investigate the potential to fill in low areas along the riverbank of the Perry River to reduce saline inflows during very high tide events (e.g. king tides with strong winds)
  - Modification to bank height will be done in a sensitive manner to reduce potential impacts to Growling Grass Frogs and their habitat (e.g. using a long armed excavator from the unvegetated wetland).
- Construct at least three small freshwater wetlands to intercept surface flows before they enter the wetland.

### Performance criteria

- Saline inflows from Perry River reduced as a result of any infill works.
- Small constructed wetlands function as additional freshwater refuges on site.

### Potential corrective action

- If salinity is an ongoing problem, consider pumping freshwater into the wetlands (constructed and/or existing) or constructing a low levee continuous along the banks of the Perry River.

#### 5.7.2 Northern offset site

Due to the presence of a freshwater soak at the northern offset site, freshwater conditions at this site will be more readily maintained. The existing freshwater soak is elevated, and as a result it is not influenced by saline inflows from Perry River.

A perched wetland is proposed to be constructed at this offset site immediately adjacent to the existing soak, which will be fed by overflows from the soak. This raised wetland will be largely removed from the influence of the freshwater to saline Perry River. The causeway will have its overflow pipe removed and it will be raised; this will inundate the existing drainage swale upstream of the causeway and reduce saline intrusion from the Perry River into this site.

### Management actions

- Construct a perched wetland adjacent to the existing soak, to be fed by overflow from the soak.
- Remove the pipe under the causeway and raise the causeway, to inundate the existing drainage swale and reduce saline intrusion from the Perry River into this site.

### Performance criteria

- An additional perched wetlands constructed.
- The causeway upgraded.

### Potential corrective action

- Increase the height of the causeway, or construct a low levee to decrease saline inflows from the Perry River.

## 5.8 Overwintering sites

Refer to  
update #21

During the non-active season, Growling Grass Frogs overwinter under logs and rocks, and in dense thickets of vegetation. While there are plenty of reeds, sedges and rushes for overwintering at the proposed offset site, there were very few logs or rocks present. More logs and/or rocks should be added to the offset sites to provide additional overwintering sites. These will also serve as basking, perching and calling sites.

### Management actions

- Add logs and/or large rocks/boulders to the offset sites.

### Performance criteria

- Add logs and large rocks/boulders to the offset sites within the first year of the OMP

### Potential corrective action

- Increase the number of logs and large rocks/boulders added to the offset sites.

## 5.9 Managing wetland depth and vegetation cover

Habitat quality at wetlands has the potential to decrease due to wetlands becoming clogged with emergent vegetation or sediment. If ponds become too shallow due to a build-up of sediment or clogged with emergent vegetation, vegetation or sediment should be removed. Cover of emergent vegetation should be kept below approximately 50% cover in each wetland. However, only 50% of wetlands at each of the offset sites should have their vegetation and/or sediment removed in a given 12 month period.

Any actions under this OMP that involve the removal or damage of native vegetation will require pre-approval by Trust for Nature to temporarily waive the relevant provisions of the Conservation Covenant, and may also require a native vegetation clearing permit from the relevant authority

### Management actions

- Monitor vegetation cover and depth of wetlands.
- If emergent vegetation cover exceeds 50%, remove emergent vegetation so cover is reduced to approximately 10%.
- If depth of wetlands decreases by 25% due to deposition of sediments, remove sediments.
- A maximum of 50% of wetlands will have their vegetation/sediment removed in a 12 month period

### Performance criteria

- Emergent vegetation cover <50% in all wetlands.
- Depth of wetlands has not declined by 25% due to sediment deposition.

### Potential corrective action

- Increase depth of wetlands to prevent emergent vegetation growth.

## 5.10 Chytrid Control

While chytrid fungus is likely already widespread in the region, the further spread of chytrid will be minimised through adherence to best-practice hygiene protocols (e.g. Murray *et al.* 2010).

Good chytrid control practices also reduce the likelihood of weeds and other pathogens being introduced to the offset sites.

### Management actions

- When working in the offset sites:
  - ~~Clean vehicles coming on site and/or ensure vehicles have been washed down immediately prior to coming on site.~~

Refer to  
update #22

- Clean and disinfect equipment to minimise the risk of introducing or spreading chytrid fungus.
- Clean and disinfect footwear when working around Growling Grass Frog habitats.
- Monitor the cover of shrubs or trees > 2m tall within 10 m of wetlands and control them as required, to ensure that wetlands are not shaded.

#### Performance criteria

- Wash down and disinfect vehicles, equipment and footwear before working in and around wetlands
- No major Growling Grass Frog population declines outside of expectations based on annual conditions.

#### Potential corrective action

- If chytrid is suspected to be causing major population declines, test the chytrid loads on resident Growling Grass Frogs. If mean zoospore loads are above 10,000 per swab, a level thought to be lethal in a variety of amphibians (Kinney *et al.* 2011; Heard, Scroggie, and Clemann 2012), drain the wetlands outside the Growling Grass Frog breeding season and allow the wetland to dry out. However, do not drain more than half the wetlands at each offset site per year.
- If chytrid infection is widespread, consider increasing the salinity of the wetlands or creating areas of shallow rock around the wetland to increase water temperatures.

### 5.11 Growling Grass Frog population and habitat monitoring

The Growling Grass Frog population and habitat will be monitored twice annually.

The Growling Grass Frog population will be monitored ideally in once in November or December during the breeding season and then again in January to March to get a measure of breeding success. Growling Grass Frog populations can fluctuate dramatically from season to season based on prevailing conditions.

Population monitoring will adhere to the following protocols:

- Two nocturnal surveys of each water body during the main activity period (October-March), preferably with one survey in November/December to determine the number of adults and whether breeding has occurred (i.e. tadpoles are present) and another in January-March to determine breeding success (i.e. the presence of metamorphs or juveniles).
- Each water body will be surveyed by two suitably qualified personnel for at least 15 minutes, with total survey time determined by the size of the water body and habitat complexity.
- Survey will proceed in the following order:
  - Call recognition to see if any male frogs are calling. This will include call playback, where Growling Grass Frog calls will be played for at least 1 minute and any responses listened for.
  - Undertake a visual inspection of the waterbody and vegetation with a spotlight and with the aid of binoculars.



- Search the perimeter of the waterbody or edge of the creek for frogs, scanning vegetation on the banks and within the water body.
- Records will include:
  - The location (with a GPS), time and activity of each frog encountered/heard.
  - The microhabitat (e.g. sitting on floating pond weed in middle of wetland).
  - Where possible, identify the age class of individuals (e.g. snout to groin length = < 30 mm – metamorph; 30-50 mm sub-adult; and >50 mm adult).

Growling Grass Frog habitat quality will also be assessed, based on the habitat parameters preferred by Growling Grass Frog, including

- A high cover of floating and submergent vegetation,
- A good cover of emergent vegetation surrounding the wetland.
- Tussock grasses with inter tussock areas in terrestrial habitat around wetlands.
- Remaining terrestrial habitat dominated by mown grassy areas.
- Adequate rocks and logs for calling, perching, basking and overwintering.
- Water quality and availability

Each spring, Growling Grass Frog habitat quality will be assessed to identify any major changes to the habitat on site, and determine which habitat variables are preferred by Growling Grass Frog at each wetland. This will involve assessing:

- The area and cover of riparian fringing, emergent and floating/submergent vegetation. Drone photography could be used to determine the area and approximate cover in each zone.
- Floristic assessments at each wetland. These assessments will involve assessing the species and their cover along two transects per wetland.
- Water quality (temperature, electrical conductivity, salinity, pH, turbidity, dissolved oxygen)
- Average depth of each wetland and how full (%) each wetland is.
- Sedimentation of the ponds
- Terrestrial habitat management (mowing, maintaining tussocks with open spaces in between)

The following management actions will be followed for both types of survey.

- Footwear and equipment will be washed with disinfectant between water bodies to prevent the spread of chytrid.
- A report, including survey methods, results and discussion, as well as recommendations for changes in management regimes if required, will be written annually. It will include long term data sets so population size can be tracked through time.
- Surveys will continue for at least 10 years following the onset of this OMP.

### Management actions

- Growling Grass Frog population and habitat surveys as outlined above will be conducted twice per year for 10 years following onset of this OMP.

### Performance criteria

- Growling Grass Frog population surveyed twice annually.
- Populations not declining beyond what is expected based on conditions.
- Specific triggers for further management actions are as follows:
  - A decline of  $\geq 10\%$  in the number of individuals recorded during summer surveys over each of three successive years.
  - An overall decline of  $>25\%$  in annual average number of individuals recorded during summer surveys over a three-year period.
  - A decline of  $>50\%$  in a single year.
- Habitat monitored twice annually, and supports features preferred by Growling Grass Frogs.

### Potential corrective action

- Investigate potential causes of decline (e.g. low rainfall, predation, reduced habitat quality, chytrid etc.)
- Increased habitat quality, including improving the following:
  - Water quality.
  - Weed management.
  - Shelter and basking sites (e.g. rocks and logs)
  - Terrestrial habitat (i.e. maintaining open spaces for foraging and movement)
  - Areas of submergent and floating vegetation, including removing some emergent vegetation if wetlands become overgrown.
- Increase monitoring of predatory fish, and if found, drain wetland(s)  
Improve pest animal management.

## 5.12 Management actions following the ten year management period.

 Refer to  
update #23

Management actions to be carried out in perpetuity following the initial 10 year management will aim to maintain the habitat created over the 10 year management period. Management actions in perpetuity are outlined in Table 7 and will be limited to:

- Maintain fencelines in accordance with section 5.1 of this document.
- Managing weeds encountered on site as outlined in section 5.4. However a formal weed monitoring program will not be implemented. The offset sites will be walked over annually in spring, and woody weeds and problem herbaceous weeds encountered will be controlled.
- Pest animals will be controlled when encountered on site as per section 5.5.
- Thinning native vegetation as required as per section 5.6.

Maintaining good hygiene practices when conducting works inside the offset sites to reduce the spread of chytrid fungus and weeds as per section 5.10

**Table 6 Schedule of management actions during 10 year management period.**

Objective	Timing of activity	Standard to be achieved	Related section(s)
<b>1. Fence offset sites to exclude stock and prevent access.</b> Fencing the offset sites will reduce damage to habitat and reduce the spread of weeds and pathogens. Fences will be monitored and maintained.	With a month of this OMP coming into force.	Exclude stock, unauthorised access and vehicles from the offset area. Construct and maintain fencing to the cattle and sheep standard outlined in DSE (2009b). If new fences are required to control new and emerging threats, fencing design will incorporate the standards outlined above for stock.	5.1
<b>2. Maintain existing spring fed soak at northern offset site.</b>	Ongoing	Maintain the current spring fed soak at the northern offset site. Overflow can be used to maintain new constructed wetlands at the northern offset site	<b>Error! eference source not found.</b>
<b>3. Increase freshwater wetland area at offset sites</b> Additional wetlands will be constructed at offset sites	Within 1 year of commencement of OMP	The area of freshwater wetlands will be increased at both offset sites. At the southern offset site, at least three small wetlands will be constructed at the northern end of the offset site to capture overland flows following rainfall. At the northern offset, a small, deep, perched wetland will be constructed adjacent to the existing soak, which will be fed by overflow from the soak. In addition, the pipe will be removed from the causeway in the south-eastern corner of the offset site, and the causeway upgraded. This will allow overflows from the spring and overland flows down the small drainage line to backfill and pool upstream of the causeway. Construction of additional wetlands done in a sensitive way to minimise environmental impact.	5.2
<b>4. Herbaceous weed management</b> Herbaceous weeds are to be monitored and controlled in accordance with DSE (2012a).	Annually in spring	Monitor weed cover across the offset sites. Cover of herbaceous weeds not to exceed current levels. Current levels to be determined during first year of monitoring. Cover of target weeds <1% by the end of the 10 year management plan No new threatening weeds on site. Use physical removal where possible and where herbicides are used, use less toxic herbicides and use wet wicking as much as possible to reduce off target impacts (i.e. to native vegetation and	5.4.1

Objective	Timing of activity	Standard to be achieved	Related section(s)
		wetlands).	
<b>5. Woody weed management</b> Woody weeds are to be monitored and removed in accordance with DSE (2012a).	Within 1 month of this OMP coming into force Annually in spring thereafter	Infestations of woody weeds to be controlled within 1 month of this OMP coming into force. All woody weeds encountered on site eradicated. Monitor woody weed cover across the offset sites, and record the location of woody weeds Use physical removal where possible and where herbicides are used, use less toxic herbicides and use wet wicking as much as possible to reduce off target impacts (i.e. to native vegetation and wetlands).	5.4.2
<b>6. Pest animal management</b> Rabbits, hares, foxes and deer to be controlled as required	Monitoring ongoing and control as required	Monitor pest animals biannually in spring and autumn. No rabbit warrens or fox dens within 500 m of the offset sites. Warrens and dens found on site will be fumigated and then collapsed. No ground disturbance by pest animals observed in offset sites. Monitoring and control of pest species will be ongoing, with regular inspections of offset sites for pest species.	5.5
<b>7. Native tree and shrub recruitment</b> If cover of native vegetation becomes too dense, thin cover.	Annually in spring	<10 m from wetlands, cover of native trees and shrubs >2 m should be kept below 20% >10 m from wetlands, cover of native trees and shrubs >2 m should be kept below 50% Cover of trees >5 m tall should not exceed 10% across the offset sites.	5.6
<b>8. Salinity.</b> Salinity will be managed on site as much as possible	Within 1 year of commencement of OMP	At the southern offset site: <ul style="list-style-type: none"> <li>Identify and fill in low areas along the banks of the Perry River adjacent to this site to reduce intrusion during tidal events</li> <li>Construct small wetlands at the northern end of the offset site</li> </ul> At the northern offset site: <ul style="list-style-type: none"> <li>Construct an additional perched wetland adjacent to the existing soak</li> <li>Improve the causeway to reduce saltwater intrusion from the Perry River and increase area of freshwater habitat</li> </ul>	5.7
<b>9. Overwintering habitats</b> Increase cover of logs and rocks	Within 1 year of commencement of OMP	Place more logs and rocks at each offset site to provide more overwintering sites for Growling Grass Frogs.	5.8



Objective	Timing of activity	Standard to be achieved	Related section(s)
<b>10. Chytrid control</b>	Ongoing	Vehicles to be washed down, and footwear and equipment washed down and disinfected prior to coming on site.	5.10
<b>11. Managing wetland depth and vegetation cover.</b>	Monitor annually, control as required	Emergent vegetation cover <50% in all wetlands. Wetland depth has not declined by >25% as a result of sedimentation. Remove emergent vegetation or sediment as required.	5.9
<b>11. Annual Monitoring of Growling Grass Frog population and habitat</b> Conduct monitoring of the Growling Grass Frog population, breeding success, and habitat quality over the breeding season.	Population monitoring twice per breeding season. Habitat monitoring annually in spring.	Every wetland will be monitored twice per breeding season to determine the local population size and if breeding was successful. Surveys follow DoEE survey guidelines (DEWHA 2009b), and include <ul style="list-style-type: none"> <li>• Call recognition including call playback, to see if Growling Grass Frog are calling.</li> <li>• Searching the waterbody and surrounding habitat for Growling Grass Frog.</li> <li>• Recording the location and size class of each individual.</li> </ul> Habitat quality will also be assessed using at least two transects per wetland. An annual Growling Grass Frog monitoring report will be written, and include any new management actions to be implemented. Specific triggers for further management actions are as follows: <ul style="list-style-type: none"> <li>• A decline of <math>\geq 10\%</math> in the number of individuals recorded during summer surveys over each of three successive years.</li> <li>• An overall decline of &gt;25% in annual average number of individuals recorded during summer surveys over a three-year period.</li> <li>• A decline of &gt;50% in a single year.</li> </ul>	5.10

**Table 7 Schedule of management actions following the 10 year management period, including evaluation and enforcement roles.**

Objective	Timing of activity	Standard to be achieved	Related section(s)	Evaluation and enforcement
<b>1. Maintain fences at offset sites to exclude stock and prevent access.</b> Maintaining fencing at the offset sites will reduce damage to habitat & reduce the spread of weeds & pathogens.	Ongoing	Exclude stock, unauthorised access and vehicles from the offset area. Construct and maintain fencing to the cattle and sheep standard outlined in DSE (2009b).	5.1	Landholder
<b>2. Herbaceous weed management</b> Herbaceous weeds are to be monitored and controlled in accordance with DSE (2012a).	Ongoing, with a site walkover in spring	Cover of herbaceous weeds not to exceed current levels. Cover of target weeds to be maintained at <1%. No new threatening weeds on site. Use physical removal where possible and where herbicides are used, use less toxic herbicides and use wet wicking as much as possible to reduce off target impacts (i.e. to native vegetation and wetlands).	5.4.1	Landholder
<b>3. Woody weed management</b> Woody weeds are to be monitored and removed in accordance with DSE (2012a).	Ongoing, with a site walkover in spring	All woody weeds encountered on site eradicated. Use physical removal where possible and where herbicides are used, use less toxic herbicides and use wet wicking as much as possible to reduce off target impacts (i.e. to native vegetation and wetlands).	5.4.2	Landholder
<b>4. Pest animal management</b> Rabbits, hares, foxes and deer to be controlled as required	Ongoing, with a site walkover in spring	Monitor pest animals on site, and destroy any dens/warrens encountered during annual spring site walk over. No rabbit warrens or fox dens within 500 m of the offset sites. Warrens and dens found on site will be fumigated and then collapsed. No ground disturbance by pest animals observed in offset sites.	5.5	Landholder
<b>5. Native tree and shrub recruitment</b> If cover of native vegetation becomes too dense, thin cover.	Ongoing, with a site walkover in spring	<10 m from wetlands, cover of native trees and shrubs >2 m should be kept below approximately 20% >10 m from wetlands, cover of native trees and shrubs >2 m should be kept below approximately 50% Cover of trees >5 m tall should not exceed approximately 10%.	5.6	Landholder
<b>6. Chytrid control</b>	Ongoing	Vehicles to be washed down, and footwear and equipment washed down and disinfected prior to coming on site.	5.10	Landholder

## 6 Implementation plan

An implementation plan for management actions and monitoring activities is outlined in Table 8.

Works are scheduled as follows:

- Fence the offset sites immediately following the site being legally secured as an offset
- Over the first winter following the establishment of the offset site:
  - Construct the new wetlands
  - Modify the causeway at the northern offset site.
  - Identify and infill areas where the riverbank is lower at the southern offset
  - Add new overwintering habitat at both offset sites.
- Every spring conduct:
  - Weed monitoring and management.
  - Monitor cover of native trees and shrubs.
  - Monitor wetland depth and vegetation cover.
  - Monitor Growling Grass Frog habitat quality.
  - Monitor pest species while conducting other monitoring programs.
- Growling Grass Frog population monitoring will be conducted twice per breeding season.
- As required:
  - Maintain fence lines
  - Control pest animals
- As required over winter:
  - Thin native shrubs and trees
  - Remove wetland vegetation
  - De-silt wetland

**Table 8 Implementation plan for the proposed management actions and monitoring to be conducted over the 10 year management plan and ongoing in perpetuity, based on the offsets being established at the end of 2019.**

Refer to update #24

Specific management and monitoring actions (e.g. weed monitoring and control) are highlighted in dark aqua, with as required management activities (e.g. maintaining fencelines) outlined in light aqua. Less formal ongoing management and monitoring (e.g. a site walkover with weed control) are indicated by cross-hatched square. Seasons are indicated by A = autumn, W = winter, S = spring, Su= summer.

Works	2020				2021				2022				2023				2024				2025				2026				2027				2028				2029				Ongoing			
	A	W	S	Su	A	W	S	Su	A	W	S	Su	A	W	S	Su	A	W	S	Su	A	W	S	Su	A	W	S	Su	A	W	S	Su	A	W	S	Su	A	W	S	Su	A	W	S	Su
Fence offsets, maintain fence lines																																												
Construct new wetlands, modify causeway																																												
Weed management																																												
Pest animal control																																												
Native tree and shrub recruitment																																												
Infill low areas of riverbank at southern offset																																												
Add new overwintering habitat																																												
Managing wetland depth and vegetation cover																																												
Chytrid control																																												
Growling Grass Frog population monitoring																																												
Growling Grass Frog habitat monitoring																																												



## 7 Risk assessment

This OMP covers management activities at the two proposed offset sites at 191 Springberg Lane Perry Bridge for the 10 year management period. A risk assessment is presented in Table 9. The key risks identified during the risk assessment process are as follows

- Growling Grass Frog population declines due to poor habitat quality. Poor habitat may be due to one or more of the following issues:
  - Stock entering the offset site due to poorly maintained fencing.
  - Weeds reducing habitat quality.
  - Insufficient habitat overwintering.
  - Wetland too saline.
  - Not enough water present on site.
  - Wetlands clogged with emergent vegetation or sediment.
  - Terrestrial habitat overgrown with trees and shrubs.
- Predation by pest species.
- Chytrid fungus infection.
- Mortality during works in the offset sites.

### 7.1.1 Risk assessment framework

The risk assessment follows the framework outlined in the DoEE Environmental Management Plan Guidelines (Commonwealth of Australia 2014), and is summarised below.

#### Risk Matrix

Likelihood	Consequence				
	Minor	Moderate	High	Major	Critical
Highly Likely	Medium	High	High	Severe	Severe
Likely	Low	Medium	High	High	Severe
Possible	Low	Medium	Medium	High	Severe
Unlikely	Low	Low	Medium	High	High
Rare	Low	Low	Low	Medium	High

### Likelihood definitions

Likelihood		Definition (based on qualitative assessment)
<b>Rare</b>	1	May occur in exceptional circumstances
<b>Unlikely</b>	2	Could occur but considered unlikely or doubtful
<b>Possible</b>	3	Might occur during the life of the project
<b>Likely</b>	4	Will probably occur during the life of the project
<b>Highly Likely</b>	5	Is expected to occur in most circumstances

### Consequence definitions

Consequence		Definition (based on qualitative assessment)
<b>Minor</b>	1	Minor incident of environmental damage that can be reversed
<b>Moderate</b>	2	Isolated but substantial instances of environmental damage that could be reversed with intensive efforts
<b>High</b>	3	Substantial instances of environmental damage that could be reversed with intensive efforts
<b>Major</b>	4	Major loss of environmental amenity and real danger of continuing
<b>Critical</b>	5	Severe widespread loss of environmental amenity and irrecoverable environmental damage

**Table 9 Risk assessment for the proposed offset sites**

Objectives (see Table 6)	Incident/event	Potential impact	Cause	Consequence	Likelihood	Risk Ranking	Controls	Residual Risk	Related monitoring see Table 10
All	Monitoring reveals Growling Grass Frog population decline.	Local population of Growling Grass Frog declines or goes extinct.	<ul style="list-style-type: none"> <li>Wetland habitat quality inadequate.</li> <li>Predation by pest animals</li> <li>Chytrid infection.</li> <li>Trampling by livestock</li> </ul>	3	2	M	<ul style="list-style-type: none"> <li>Growling Grass Frog population will be monitored twice per breeding season to assess the population and to detect declines as soon as possible.</li> <li>Monitoring and management of weeds, pest species and water quality will provide indication of environmental performance.</li> <li>In the event of population decline, adaptive management will be implemented with the help of qualified zoologists, DELWP and/or DoEE and will include, but will not be limited to: <ul style="list-style-type: none"> <li>Increased vegetation management.</li> <li>Controlling pest species and weeds.</li> <li>Improving fencing.</li> <li>Increasing overwintering sites</li> <li>Controlling salinity.</li> <li>Implementing measures to reduce the incidence of chytrid infection</li> </ul> </li> </ul>	L	1
1	Entry of domestic stock into offset sites	Damage to native vegetation from grazing and trampling. Compaction of soils	<ul style="list-style-type: none"> <li>Fencing inadequate or damaged.</li> </ul>	1	4	L	<ul style="list-style-type: none"> <li>Fencing is constructed to standards (DSE 2009b)</li> <li>Regular inspection of fencing</li> <li>Repair damaged fencing as soon as possible</li> <li>Regularly visit offset site to ensure that stock have not entered offset sites</li> <li>Remove stock from offset sites immediately.</li> </ul>	L	2, 5
1	Unauthorised access of vehicles or people to offset sites	Damage to native vegetation and wetlands.	<ul style="list-style-type: none"> <li>Offset inadequately fenced</li> </ul>	1	3	L	<ul style="list-style-type: none"> <li>Fencing is constructed to standards (DSE 2009b)</li> <li>Repair fencing if damaged</li> <li>Offset sites on private property, so public access is limited</li> </ul>	L	2, 5
2	Existing soak at northern offset damaged during works	Soak damaged, leading to reduction in Growling Grass Frog habitat	<ul style="list-style-type: none"> <li>Inadequate site inductions</li> <li>Unauthorised works</li> </ul>	2	2	L	<ul style="list-style-type: none"> <li>Personnel working on site informed of the importance of soak.</li> <li>Only authorised works allowed to occur</li> </ul>	L	2
3, 5, 7	Growling Grass Frog killed during earthworks or vegetation removal.	Reduction in Growling Grass Frog population on site.	<ul style="list-style-type: none"> <li>Growling Grass Frog present in areas cleared</li> </ul>	2	3	M	<ul style="list-style-type: none"> <li>Undertake works as sensitively as possible to minimise impact. Techniques could include: <ul style="list-style-type: none"> <li>Using a long armed excavator to dig from outside the offset site.</li> <li>Avoid dense patches of vegetation (such as sedges, reeds, rushes, tussock grasses).</li> <li>Do not work at night when frogs will be out in the open.</li> <li>Conduct pre clearance searches where vegetation will be cleared.</li> </ul> </li> </ul>	L	1
4, 5	Woody weeds are present at the offset sites, or noxious weeds increase their cover beyond current levels	Reduction in quality of Growling Grass Frog habitat	<ul style="list-style-type: none"> <li>Inadequate weed monitoring and control</li> </ul>	2	3	M	<ul style="list-style-type: none"> <li>Increase weed monitoring and intensity of control efforts</li> <li>Minimise off target (i.e. native vegetation and wetlands) impacts by using physical removal as much as possible, by using less toxic herbicides (e.g. RoundUp Bi-active) and by using wick wiping over spraying.</li> </ul>	L	3
6	Pest animals present at offset site Damage observed to wetlands	Reduction in quality of Growling Grass Frog habitat. Predation on Growling Grass Frogs by foxes and fish.	<ul style="list-style-type: none"> <li>Inadequate pest animal monitoring and control</li> </ul>	2	3	M	<ul style="list-style-type: none"> <li>Increase pest animal monitoring and intensity of control efforts</li> <li>Destroy dens or warrens found on site</li> <li>Start controlling new and emerging pests (such as deer) if they are impacting Growling Grass Frog habitat</li> </ul>	L	4

Objectives (see Table 6)	Incident/event	Potential impact	Cause	Consequence	Likelihood	Risk Ranking	Controls	Residual Risk	Related monitoring see Table 10
7	Cover of native shrub and tree recruits is >20% within 10 m of wetlands and/or >50% more than 10 m from wetlands	Reduction in quality of Growling Grass Frog habitat	<ul style="list-style-type: none"> <li>Inadequate monitoring and control of native vegetation recruitment</li> </ul>	1	3	L	<ul style="list-style-type: none"> <li>Increase monitoring of native vegetation and intensity of control efforts as required.</li> </ul>	L	7
8	Salinity is consistently high in wetlands, particularly at southern offset site.	Reduction in extent and quality of Growling Grass Frog habitat	<ul style="list-style-type: none"> <li>Increasing salinity in Perry River due to climatic and anthropogenic impacts</li> </ul>	3	3	M	<ul style="list-style-type: none"> <li>Identify and fill in low points along the banks of the Perry River to reduce potential occasional saline inflows from the Perry River.</li> <li>Upgrade the causeway at the northern offset</li> <li>More intensive controls could include:                             <ul style="list-style-type: none"> <li>Constructing a low levee along the banks of the Perry River at the offset sites, particularly the southern offset.</li> <li>Pumping freshwater into offset sites.</li> </ul> </li> </ul>	L	6
10	Rates of chytrid increase across the offset sites.	Reduction in Growling Grass Frog population	<ul style="list-style-type: none"> <li>Improper hygiene controls.</li> <li>Too much shading</li> </ul>	3	2	M	<ul style="list-style-type: none"> <li>Hygiene protocols in place and followed.</li> <li>Shrubs and trees controlled so they do not overshadow the wetlands.</li> <li>Consider installing rock beaching at wetlands to increase water temperatures.</li> <li>Increase salinity in wetlands.</li> </ul>	L	1
11	Wetlands clogged with emergent vegetation or sediment	Reduction in extent and quality of Growling Grass Frog habitat	<ul style="list-style-type: none"> <li>Inadequate monitoring and management of wetland vegetation and sedimentation</li> </ul>	1	3	L	<ul style="list-style-type: none"> <li>Monitor depth and emergent vegetation cover.</li> <li>Removed sediment or emergent vegetation as required.</li> </ul>	L	2
All	Major environmental incident at offset sites, such as a fire or flood	Reduction in extent and quality of Growling Grass Frog habitat. Reduction in Growling Grass Frog population. Destruction of fences.	<ul style="list-style-type: none"> <li>Major environmental event</li> <li>Major chemical spill</li> </ul>	3	2	M	<ul style="list-style-type: none"> <li>Continue management and monitoring program as outlined in this OMP, in particular Growling Grass Frog population and habitat monitoring.</li> <li>Repair damaged fences</li> <li>Review this OMP.</li> </ul>	M	All

Refer to update #25

Refer to update #26



## 8 Monitoring

A monitoring schedule is provided in Table 10 and explained in more detail below. Monitoring as outlined below will continue for 10 years after this OMP comes into force.

### 8.1 Growling Grass Frog population

Monitoring for Growling Grass Frog will be essential to determine whether the offset sites are providing suitable habitat and offsetting impacts to this species. Monitoring of the onsite Growling Grass Frog population will begin during the first year of this OMP and continue for the ten year management phase. Monitoring will record the number of individuals and where possible their sex and age (metamorph, sub-adult, adult). Monitoring will occur twice over each active season, ideally once while breeding (November-December) and then again following breeding (January-February) to determine breeding success.

Growling Grass Frog surveys were conducted at the offset sites in January and March 2019, but no Growling Grass Frog were recorded on site (Ecology Australia In Prep). This is likely due to the prevailing conditions in Central Gippsland; the region has been under drought conditions for the past three years. In wetter years Growling Grass Frog are abundant at the southern offset site (R Crombe Pers. Comm.). Growling Grass Frog were recorded at the northern offset site by other researchers over the 2018-2019 breeding season (Turner 2019). Green and Golden Bell Frogs were recorded at both offset sites (Ecology Australia In Prep).

Surveys will be conducted in accordance with survey guidelines for Growling Grass Frog (DEWHA 2009b). Specifically, monitoring will be conducted on warm (>12°C), calm nights and should:

- Include a combination of call playback and night visual surveys
- Cover a range of water body types.
- Be accompanied by a habitat assessment, and
- Be undertaken by appropriately experienced personnel.

Surveys will involve walking the whole perimeter of each wetland, unless some of the perimeter of the wetlands is inaccessible. In addition, dip netting will be conducted for Growling Grass Frog tadpoles.

Any incidental observations of Growling Grass Frog will also be recorded.

In addition, any Green and Golden Bell Frogs encountered will be recorded.

### 8.2 Growling Grass Frog habitat assessment

Each spring and autumn, Growling Grass Frog habitat quality will be assessed to identify any major changes to the habitat on site, with particular attention given to whether the habitat variables preferred by Growling Grass Frog at each wetland have changed. This will involve assessing:

- The area and cover of riparian fringing, emergent and floating/submergent vegetation. Drone photography could be used to determine the area and approximate cover in each zone.
- Floristic assessments at each wetland. These assessments will involve assessing the species and their cover along two transects per wetland.
- Recording weeds present and the location of any infestations requiring control.

- Water quality (temperature, electrical conductivity, salinity, pH, turbidity, dissolved oxygen)
- Average depth of each wetland and how full (%) each wetland is.
- Sedimentation of the ponds
- Terrestrial habitat at the offset sites will also be assessed. Two transects will be run through the terrestrial habitats at each offset site.

### 8.3 Fence condition

The boundary fence at both offset sites will be inspected quarterly and again during any monitoring programs. Any damage to the fence that increases the likelihood

### 8.4 Weeds

Weed monitoring will be conducted annually in spring in conjunction with the habitat monitoring. Monitoring will consist of inspecting the entire offset site for woody weeds and targeted weeds on foot. Infestations of targeted weeds can then be logged using a GPS, and their location given to the weed management contractors for treatment. Infestations earmarked for treatment will be inspected during the subsequent weed monitoring program to evaluate the success of weed management. If major infestations of non-targeted weeds are identified that warrant treatment, the location of these sites should be recorded and passed on to weed contractors. If new high threat weeds arrive on site that need to be controlled, they will be added to the targeted weeds list.

### 8.5 Pest animal monitoring

Signs of pest animals will be noted and their location recorded during all monitoring programs, and whenever the offset site is visited. Any active rabbit warren or fox dens will be fumigated and collapsed by a suitably qualified contractor. Subsequent monitoring events will revisit collapsed warrens and dens to determine whether they are still being used. Any other warrens or dens encountered within 500 m of the offset site will be fumigated and collapsed.

Wetlands should be visually assessed for the presence of predatory fish. If predatory fish become an issue, wetlands should be drained and refilled. Only 50% of wetlands at an offset site should be drained in a single year.

If other emerging pests (such as Hog Deer) or new pests have a significant impact on the site, the landholder and the TfN will be informed. If required, a suitable control plan can be developed and implemented in consultation with the landholder and TfN. Note that Hog Deer require an Authority to Control Wildlife permit to control them on private property.

### 8.6 Water Quality (Salinity)

Water quality will be monitored at each wetland during Growling Grass Frog habitat and population assessments. Water quality parameters measured will include

- Salinity
- Electrical conductivity (EC)
- Temperature

- pH
- Turbidity
- Dissolved oxygen (DO)

## 8.7 Native tree and shrub recruitment

The cover of native trees and shrubs will be visually assessed during habitat assessments. This will be completed for the offset site as a whole, and within 10 m of each wetland. If cover of trees and shrubs greater than 2 m tall is >20% within 10 m of each wetland or >50% more than 10 m from wetlands, cover should be reduced via ecological thinning. Cover of trees over 5 m tall should not exceed 10% across each offset sites.

**Table 10 Monitoring schedule**

	Monitoring Activity	Parameter Measured	Monitoring guidelines	Where	When
1	Growling Grass Frog population monitoring	Number of Growling Grass Frogs observed, and age class	Two nocturnal call playback and spotlighting surveys per breeding season covering all constructed wetlands Refer to section 8.1 for further details.	All wetlands at the offset sites	Twice annually (preferably once in November/December and again in January/February)
2	Growling Grass Frog habitat monitoring	Vegetation, water quality and depth, sediment	Habitat quality (vegetation cover and area, floristics, water quality, pond depth, sedimentation and terrestrial habitat) will be assessed bi annually. Refer to section 8.2 for further details.	Across the offset sites.	Annually in spring
3	Weed monitoring	Target and woody weeds	Entire offset sites surveyed by foot to identify targeted and woody weeds on site, and map their location. Locations will then be provided to weed management contractors for control. Areas earmarked for control revisited in subsequent surveys. Refer to section 8.4 for further details.	Across the offset sites.	Annually in spring in conjunction with habitat monitoring
4	Pest animal monitoring	Presence of pest animals (introduced fish, foxes, rabbits)	During habitat assessments, signs of pest animals will be recorded, and the location of any warrens and dens will be provided to a pest control contractor. Wetlands will be visually assessed for signs of any predatory fish Refer to section 8.5 for further details.	Across the offset sites.	Annually in spring during habitat monitoring program.
5	Fence condition	Fence condition	Survey the perimeter of the offset to ensure fences are in good condition, and there is no evidence of stock or vehicle access. Refer to section 8.3 for further details.	The offset perimeter	Quarterly
6	Water quality	Salinity, EC, pH, temperature, DO and turbidity	Test the water quality at each wetland during Growling Grass Frog population and habitat monitoring programs. Refer to section 8.6 for further details.	Every wetland	During each Growling Grass Frog habitat and population monitoring event.
7	Tree and shrub recruitment	Cover of woody species >2 m tall	Cover of large (>2 m tall) woody plants estimated. Refer to section 8.7 for further details.	Across the offset sites.	Annually in spring during habitat monitoring program.



## 9 Reporting, auditing and OMP review

### 9.1 Reporting

The landowner (Robert Cromb or a future owner) must provide a report to the approval holder detailing all management and monitoring conducted for each year of the 10 year management period. This will be split into a Growling Grass Frog population and habitat monitoring report and a second report detailing all other management actions, monitoring, compliance and non-compliance and incidents. Reports should be completed by June 30 so management actions can be planned and implemented as required before the next Growling Grass Frog breeding season. The annual reports will provide enough written evidence that the management and monitoring commitments outlined in this document are complied with, and determine progress against these commitments.

The annual reports must include:

- The details of management actions undertaken within the reporting period.
- The details of monitoring activities conducted during the reporting period, including Growling Grass Frog population and habitat monitoring. Monitoring reports will include long term monitoring data so population trends can be discussed.
- Site photographs, including photos of each wetland.
- Details of compliance or non-compliance with schedule of management actions and performance criteria.
- Details of any incidents or new management issues, with recommendations for corrective actions, and whether the OMP should be reviewed.

The approval holder must submit an annual compliance report to DoEE for each year of the 10 year management period.

A reporting schedule is provided in Table 11.

### 9.2 Auditing

Riverlee (or subsequent EPBC Act approval holder) is responsible for auditing the implementation and effectiveness of this OMP. Audits will be conducted by an independent ecologist as follows:

- At the end of the first year of this OMP – this is to ensure that initial management actions are satisfactorily completed.
- At the end of the third year of this OMP – this will involve a review of three rounds of annual monitoring, the Growling Grass Frog population at the offset sites and an independent assessment of Growling Grass Frog habitat quality in the offset sites.
- At the end of the, fifth, seventh and ninth year of this OMP – as per the third year audit.
- Following the final year of this OMP (i.e. the tenth year) – this will be the final audit of the implementation and effectiveness of this OMP.

The timing of audits is outlined in Table 11. Additional audits may be triggered as a result of an OMP review, or following major environmental incidents resulting in significant changes to the site.

### 9.3 OMP Review

This OMP includes the potential for ongoing adaptive management, whereby management actions may be modified or triggered by major events occurring within the offset site (e.g. fire, flood) or by the results of monitoring (e.g. major population decline or reduction in habitat quality). If there is a major environmental event which results in a significant change to the condition or character of the site or a major Growling Grass Frog population decline, Riverlee (or subsequent EPBC Act approval holder) must ensure that this OMP is reviewed.

The OMP review will be conducted by Riverlee (or a suitably qualified consultant) in consultation with DoEE and the landholder. Any changes will need to be approved by the DoEE. Changes will be incorporated into this OMP and an updated version will be supplied to the DoEE.

Any part of this OMP can be changed as part of the review in order to adequately respond to the trigger or improve management outcomes under changed site conditions.

This could involve changes to

- Details of site management methodologies
- Monitoring methods
- Monitoring, reporting and auditing programs.

**Table 11 Reporting schedule**

Type of Report	Timing	Trigger	Responsibility
<p><b>Annual management actions and monitoring report</b></p> <p>Outlines all management actions completed on site for a given monitoring period (spring to autumn).</p> <p>Present the results of offset site monitoring, excluding Growling Grass Frog population and habitat condition.</p> <p>Outline compliance/non-compliance with schedule of management actions and performance criteria.</p> <p>Outline any incidents or new issues on site.</p>	<p>Report to be completed annually by June 30 so it can be reviewed prior to subsequent management program.</p>	<p>Following annual monitoring</p>	<p>Offset site owner</p>
<p><b>Growling Grass Frog monitoring report</b></p> <p>Present the results of Growling Grass Frog population and habitat condition monitoring.</p> <p>Monitoring reports to include long term monitoring data so population trends can be identified.</p>	<p>Report to be completed as soon as possible following autumn monitoring so results can be interpreted and management actions implemented as needed.</p>	<p>At completion of annual monitoring, or as requested by DoEE</p>	<p>Offset site owner</p>
<p><b>Annual Compliance Report</b></p> <p>Consisting of the two reports outlined above, with a cover page outlining any non-compliances or incidents.</p>	<p>Report to be submitted to the DoEE each year at the anniversary of the implementation of this OMP.</p> <p>To be published online within 60 days of submission to DoEE</p>	<p>Annually, on anniversary of OMP</p>	<p>EPBC Act approval holder</p>
<p><b>Audit report</b></p>	<p>Years 1, 3, 5, 7, 9 and 10 of this OMP</p>	<p>Not applicable</p>	<p>EPBC Act approval holder</p>
<p><b>Review of this Offset Management Plan</b></p>	<p>As required</p>	<p>Following a major environmental event that changes the character of the site (e.g. major flood or fire) or a significant decline in the Growling Grass Frog population</p>	<p>Offset site owner</p>

## 10 Incidents, non-compliance and emergency contacts

### 10.1 Incidents and non-compliance

Any incidents and non-compliance must be addressed with corrective action as soon as possible. An incident is defined in the approval conditions as “any event which has the potential to, or does, impact on protected matter(s)”.

As outlined in approval conditions 16 and 17, the DoEE must be informed of any incidents or non-compliances within two business days, and the approval holder must provide details within 10 days. Specifically:

16. *The approval holder must notify the Department in writing of any: incident; non-compliance with the conditions; or non-compliance with the commitments made in plans. The notification must be given as soon as practicable, and no later than two business days after becoming aware of the incident or non-compliance. The notification must specify:*
  - a) *the condition which is or: may be in breach; and*
  - b) *a short description of the incident and/or non-compliance.*
  
17. *The approval holder must provide to the Department the details of any incident or non-compliance with the conditions or commitments made in plans as soon as practicable and no later than 10 business days after becoming aware of the incident or non-compliance, specifying:*
  - c) *any corrective action or investigation which the approval holder has already taken or intends to take in the immediate future;*
  - d) *the potential impacts of the incident or non-compliance; and*
  - e) *the method and timing of any remedial action that will be undertaken by the approval holder.*

Corrective action will be dependent on the non-compliance/incident, but may include

- Replacing or repairing fencing the offset sites
- Controlling weeds and pest animals on site.
- Improving native vegetation on site to better meet the habitat requirements of Growling Grass Frogs.
- Assessing the cover of native trees and shrubs on site, and controlling as required.
- Improving water quality, especially salinity, in wetlands.
- Controlling the spread of chytrid on site.

Major incidents or non-compliance may trigger a review of the OMP as outlined in section 9.3

### 10.2 Emergency Contacts

The key emergency contacts are:

- Robert Cromb – Landholder – 0490 387 730



- Riverlee – 03 9620 3888
- Emergency Services – 000 – for life threatening emergencies.
- Wildlife Victoria – 03 8400 7300 – for injured wildlife.
- DELWP wildlife emergencies – 136 186 – for injured wildlife.
- Ecology Australia (or another environmental consultancy) – 03 9489 4191 – for salvage, relocation, or other environmental services.
- Environmental Protection Agency – 1300 372 842 – for pollution and chemical spills.
  - Department of Environment and Energy – to report incidents - 02 6274 1111

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## 12 Glossary

ARI	ARI (Average Recurrence Interval) is an estimate of the average time between random events based on historical data. For example, a 1 in 10 year flood event means there is a 10% chance of a flood event of that size occurring in a given year.
Bioregion	Defined geographical regions of Australia with similar climatic and geophysical characteristics, and which generally contain a suite of distinct ecosystems and species
CaLP Act	<i>Victorian Catchment and Land Protection Act 1994</i>
EMP	Conservation Management Plan
Conservation status	Categorisation of the threat risk to biological assets (plant and animal species, EVCs or plant communities) at a defined scale (e.g. national, state), as determined by specific criteria
DELWP	Victorian Department of Environment, Land, Water and Planning
DoEE	Commonwealth Department of Environment and Energy
Ecological Vegetation Class (EVC)	A vegetation classification described through a combination of its floristic composition, life form and ecological characteristics, and its association with particular environmental attributes. EVCs may include one or more floristic communities that occur across a biogeographic range, and have similar habitat and ecological processes operating
Endemic	Naturally found only in a defined geographic area
EPBC Act	<i>Commonwealth Environment Protection and Biodiversity Conservation Act 1999</i>
Exotic	Plants, animals, fungi and other organisms that have been introduced (deliberately or accidentally) to Australia or a given area after European settlement
Exotic vegetation	Vegetation comprised wholly or substantially of exotic species
FFG Act	<i>Victorian Flora and Fauna Guarantee Act 1988</i>
GIS	Geographic Information System. A digital platform for creating, analysing and viewing maps and other spatially referenced data
High threat weeds	Introduced species (including non-indigenous 'natives') which, as invading species have highly deleterious impacts on indigenous vegetation and faunal habitats
Indigenous	Plant and animal species found naturally in pre-European Australia
Indigenous vegetation	Vegetation native to Australia or native to a specific geographic region
Introduced	Deliberately or accidentally brought to Australia or part of Australia, usually by human agency



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Metapopulation	A population of populations. Generally it is a network of spatially separated populations that interact through migration between populations.
Native vegetation	Species occurring naturally in Australia as part of the pre-European flora or fauna
Vegetation community	Term for interacting plant populations forming vegetation. A vegetation community in formal classifications may have characteristic plant species, composition and structure
Viable population	A self-supporting population of Growling Grass Frog with breeding pairs, and sufficient numbers and genetic variety in a particular area, determined from baseline data.
VROTS	Victorian Rare or Threatened Species
WONS	Weeds of National Significance

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