



KINGS FOREST

PRECINCTS 6 - 11

THREATENED SPECIES MANAGEMENT PLAN

A Report Prepared for
Project 28 Pty Ltd

DECEMBER 2020

NEW SOUTH WALES

8/48 Tamar Street (PO Box 1465) Ballina NSW 2478
p 02 6686 3858 • f 02 6681 1659 • e ballina@jwaec.com.au

QUEENSLAND

Suite C, Building 21 Garden City Office Park, 2404 Logan Road, Eight Mile Plains QLD 4113
p 07 3219 9436 • f 07 3423 2076 • e brisbane@jwaec.com.au

www.jwaec.com.au

DOCUMENT CONTROL

Document

Title	Precincts 6 - 11 Threatened Species Management Plan
Job Number	N97017
File Reference	N97017_Kings Forest\Management Plans (2020)\Precincts 6 - 11
Version and Date	RW6 15/12/20
Client	Project 28 Pty Ltd

Revision History (office use only)

Issue	Version	Draft /Final	Date Sent	Distributed To	No. Copies	Media	Delivery Method
1	RW1	DRAFT	23/01/20	JWA	1	PDF	Email
2	RW2	DRAFT	13/02/20	Client	1	PDF	Email
3	RW3	FINAL	24/04/20	Client	1	PDF	Email
4	RW4	FINAL	18/11/20	Client	1	PDF	Email
5	RW5	FINAL	03/12/20	Client	1	PDF	Email
6	RW6	FINAL	15/12/20	Client	1	PDF	Email

Client Issue

Version	Date	Author		Approved by	
		Name	Initials	Name	Initials
RW2	13/02/20	Nicole Davies/ Phoebe Chapman/ Adam McArthur	ND/ PC/ AM	Adam McArthur	AM
RW3	24/04/20	Belinda Whyburn / Adam McArthur	BW/ AM	Adam McArthur	AM
RW4	18/11/20	Belinda Whyburn / Adam McArthur	BW/ AM	Adam McArthur	AM
RW5	03/12/20	Belinda Whyburn / Adam McArthur	BW/ AM	Adam McArthur	AM
RW6	15/12/20	Belinda Whyburn / Adam McArthur	BW/ AM	Adam McArthur	AM

TABLE OF CONTENTS

1	Introduction	5
1.1	Background	5
1.2	Aim and Objectives.....	5
1.3	Compliance with Relevant Approval Conditions.....	6
1.4	Related Management Plans Prepared for the Kings Forest Site	7
2	Site Description	9
2.1	Location	9
2.2	Site Description	9
2.3	Conservation Reserves/Ecologically Significant Areas in the Locality	9
2.4	Land Use Zones	10
3	Proposed Development	11
3.1	Background	11
3.2	Precinct Descriptions.....	11
3.3	Development Staging.....	14
4	Existing Site Values.....	15
4.1	Introduction	15
4.2	Vegetation	15
4.3	Endangered Ecological Communities.....	16
4.4	Threatened Species and Habitat Values.....	16
5	Impact Assessment	19
5.1	Introduction	19
5.2	Direct Impacts.....	19
5.3	Indirect Impacts	21
6	Management Zones	24
6.1	Identification of Management Zones.....	24
6.2	Zone 1 - Construction Zone	24
6.3	Zone 2 - Retained Koala Habitat	24
6.4	Zone 3 - Retained WSF Habitat	25
6.5	Zone 4 - Koala Compensatory Habitat	25
6.6	Zone 5 - WSF Compensatory Habitat.....	25
6.7	Zone 6 - Heath Regeneration/Revegetation	25
6.8	Zone 7 - Littoral Rainforest Regeneration/Revegetation	26
6.9	Zone 8 - Wetland Regeneration.....	26
6.10	Zone 9 - Residual Lands.....	26
7	Management Strategies.....	28
7.1	Introduction	28
7.2	Additional Species-specific Management Measures	29
7.3	Adaptive Management	30
8	Monitoring and Reporting	33
8.1	Introduction	33
8.2	Key Monitoring Objectives.....	33
8.3	Threatened Flora Monitoring.....	33

8.4	Threatened Fauna Monitoring.....	35
8.5	EEC Monitoring.....	36
8.6	Performance Targets and Corrective Actions.....	37
8.7	Reporting	43
9	Implementation Schedules	45
9.1	Introduction	45
9.2	Development Phases	45
9.3	Roles and Responsibilities	46
9.4	Implementation Table - Pre-construction Phase	47
9.5	Implementation Table - Construction Phase.....	48
9.6	Implementation Table - Operational Phase.....	49
10	Indicative Costings	50
	References	51
	Appendix 1 - Compliance with Relevant Approval Conditions	53
	Appendix 2 - Additional Kings Forest Management Plans and Their Relationship to the Precincts 6 - 11 TSMP	56
	Appendix 3 - Endangered Ecological Communities	60
	Appendix 4 - Threatened Flora Species Profiles	61

1 INTRODUCTION

1.1 Background

JWA Pty Ltd have been engaged by Project 28 Pty Ltd (Project 28) to prepare a Threatened Species Management Plan (TSMP) for Precincts 6 - 11 of the Kings Forest project site. The Kings Forest site is 846 hectares in area and is located in the coastal zone of the Tweed Shire Local Government Area (LGA). The site was zoned for residential and commercial development in the early 1990's and has been subject to a lengthy Commonwealth, State and Council approval process. Numerous ecological studies have been completed on the site over the last 30 years including detailed flora, fauna and hydrological surveys.

The protection of Threatened flora and fauna species and Endangered Ecological Communities (EECs) known to occur, or considered to be provided with suitable habitat, within the Precincts 6 - 11 and associated Environmental Management Areas (EMAs) are the focus of this TSMP. This TSMP provides specific measures for mitigating and/or minimising the potential impacts on Threatened flora and fauna species and EECs within these areas as a result of development activities. Specific management actions discussed in this TSMP will be triggered and completed on a pre-construction, construction and operational phase basis. Due to the uncertainty of the timing of commencement of construction works within Precincts 6 - 11, it is also proposed to undertake pre-commencement monitoring and maintenance works within the Precinct 6 - 11 EMAs to ensure that relevant ecological values of these areas are not compromised.

This TSMP should be read in conjunction with the Precincts 6 - 11 VWMP (JWA 2020a) which provides general vegetation and fauna management strategies applicable to all species on site, as well as details of proposed protection and restoration works such as fencing and revegetation works.

In addition, it should be noted that specific management strategies for the koala and the wallum sedge frog are included separately within the Koala Plan of Management (KPoM) (JWA 2019) and the Wallum Sedge Frog Management Plan (WSFMP) (JWA 2020b) respectively and these documents should therefore also be read in conjunction with this TSMP.

It is also noted that Concept Plan (06_0318) Approval Condition C2 requires management plan updates (where necessary) to accompany future development applications. As a consequence, there may be changes arising from these updates to specific management provisions contained in this plan.

1.2 Aim and Objectives

The aim of this TSMP is to provide guidelines, strategies and methods for the management of the threatened flora and fauna species and EECs recorded within Precincts 6 - 11 EMAs, such that species and ecological communities continue to persist and reproduce.

Specific objectives of the Precinct 6 - 11 TSMP include:

- Provide a summary of the EECs and threatened flora and fauna species occurring within Precincts 6 - 11 and associated EMAs;

- Provide a profile for each EEC and threatened flora and fauna species occurring which includes:
 - A list of overall threats to the EEC/threatened species;
 - Potential threats;
 - Recovery strategies for the EEC/threatened species including details of Approved Recovery Plans and/or Priority Actions;
- Devise management strategies to be implemented including:
 - Strategies for the protection of EEC/threatened species during the construction and operation stage of the development;
 - Weed control measures specific to areas containing listed threatened flora and fauna species;
 - Guidelines for the control of human and animal access to areas containing EECs/threatened species;
 - Strategies for the embellishment of threatened species habitat through revegetation works and/or the creation of compensatory habitat areas where required;
 - A monitoring and reporting program.

Implementation of this TSMP will ensure ongoing sustainable management of threatened species and EECs within Precincts 6 - 11 EMAs, and that land clearing and land modification activities associated with the development are effectively remediated.

1.3 Compliance with Relevant Approval Conditions

On the 19th January 2007, the NSW Minister for Planning authorised a Concept Plan (06_0318) for a proposed residential community at Kings Forest. The Minister for Planning granted part 3A approval (with conditions) for the Concept Plan for Kings Forest in August 2010. A Precincts 2-4 & 6-11 TSMP was prepared in accordance with the Concept Plan approval conditions.

The Kings Forest Stage 1 Project Application (MP 08_0194) was lodged in November 2011. The Project Application was approved (with conditions) on the 11th August 2013. Conditions of this approval required that all environmental management plans be revised.

On the 21st May 2015 the Commonwealth Department of Environment approved (with conditions) the Kings Forest residential development (EPBC 2012/6328). The Commonwealth approval is confined to the mitigation of impacts of the proposed development on the koala and wallum sedge frog, both of which are listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Species specific Management Plans have been prepared for the EPBC Act listed koala (*Phascolarctos cinereus*) and wallum sedge frog (*Litoria longburrensis*) i.e. the Kings Forest KPOM (JWA 2019) and the Kings Forest WSFMP (JWA 2020b), and these documents should be read in conjunction with this TSMP. There are no additional specific EPBC Act approval conditions relating to other threatened species on the Kings Forest development site.

Since the Commonwealth approval decision Project 28 have been liaising with Tweed Shire Council (TSC) and the NSW Department of Planning, Industry and Environment (DPI&E) to reconcile all approval conditions.

This Precincts 6 - 11 TSMP has been amended to comply with all relevant Commonwealth, State and Local Government approval conditions. **APPENDIX 1** contains the details of the following relevant Consolidated Approval Conditions and also notes where they are addressed in this TSMP:

- Concept Plan 06_0318 Consolidated Approval Conditions incorporating the following:
 - Modification No. 1, approved on 22 December 2010;
 - Modification No. 2, approved on 11 August 2013;
 - Modification No. 3, approved on 16 May 2014;
 - Modification No. 4, approved on 20 November 2014;
 - Modification No. 5, approved on 10 November 2015;
 - Modification No. 8, approved on 24 May 2018;
- Project Approval 08_0194 Consolidated Approval Conditions incorporating the following:
 - Modification No. 1, approved on 16 May 2014;
 - Modification No. 2, approved on 20 November 2014;
 - Modification No. 3, approved on 20 February 2017;
 - Modification No. 6, approved on 21 December 2017; and
 - Modification No. 7, approved 24 May 2018.

JWA hereby certify that this TSMP has been prepared in accordance with the requirements of Condition C2 of Concept Plan Approval No. CP06_0318 (as modified) and generally in accordance with the requirements of Conditions 39 and 43 of Major Project Approval No. MP08_0194 (as modified) for Kings Forest Stage 1.

1.4 Related Management Plans Prepared for the Kings Forest Site

A number of management plans were completed for the Kings Forest Stage 1 Project Application and approved under Project Approval 08_0194. Subsequent to their approval, significant work completed has been completed on the site. Several of these management plans have therefore been amended (and others will need to be amended) as required by Condition 39 of MP 08_0194.

This TSMP should be read in conjunction with the following documents prepared for the Kings Forest development:

- Kings Forest Koala Plan of Management (KPoM) (JWA 2019);
- Kings Forest Wallum Sedge Frog Management Plan (WSFMP) (JWA 2020b);
- Kings Forest Precincts 6 - 14 Buffer Management Plan (BMP) (JWA 2020c);
- Kings Forest Precincts 6 - 11 Vegetation and Weed Management Plan (VWMP) (JWA 2020a);

- Kings Forest Flora and Fauna Monitoring Report (FFMR) (JWA 2020d);
- Kings Forest Feral Animal Management Plan (FAMP) (JWA 2020e);
- Kings Forest Stage 1 Bushfire Risk Management Plan (BushfireSafe 2020);
- Kings Forest Koala Fire Management Plan (Wildsite 2020);
- Construction Environmental Management Plan (CEMP) (MUS 2020);
- Kings Forest Summary of Management Plans (SOMP) (G&S 2020a);
- Kings Forest Overall Water Management Plan (OWMP) (G&S 2020b); and
- Kings Forest Drainage Maintenance Management Plan (DMMP) (G&S 2020c).

APPENDIX 2 provides further details of these management plans and details of their relationship to the TSMP.

2 SITE DESCRIPTION

2.1 Location

Kings Forest is located on the far north coast of NSW in the Tweed local government area (LGA) approximately 20 km south of the Queensland/NSW border, 5 km north-west of the village of Bogangar and 4 km south-west of Kingscliff (**FIGURE 1**).

2.2 Site Description

The Kings Forest site is comprised of fourteen (14) land parcels with a total area of 846 hectares:

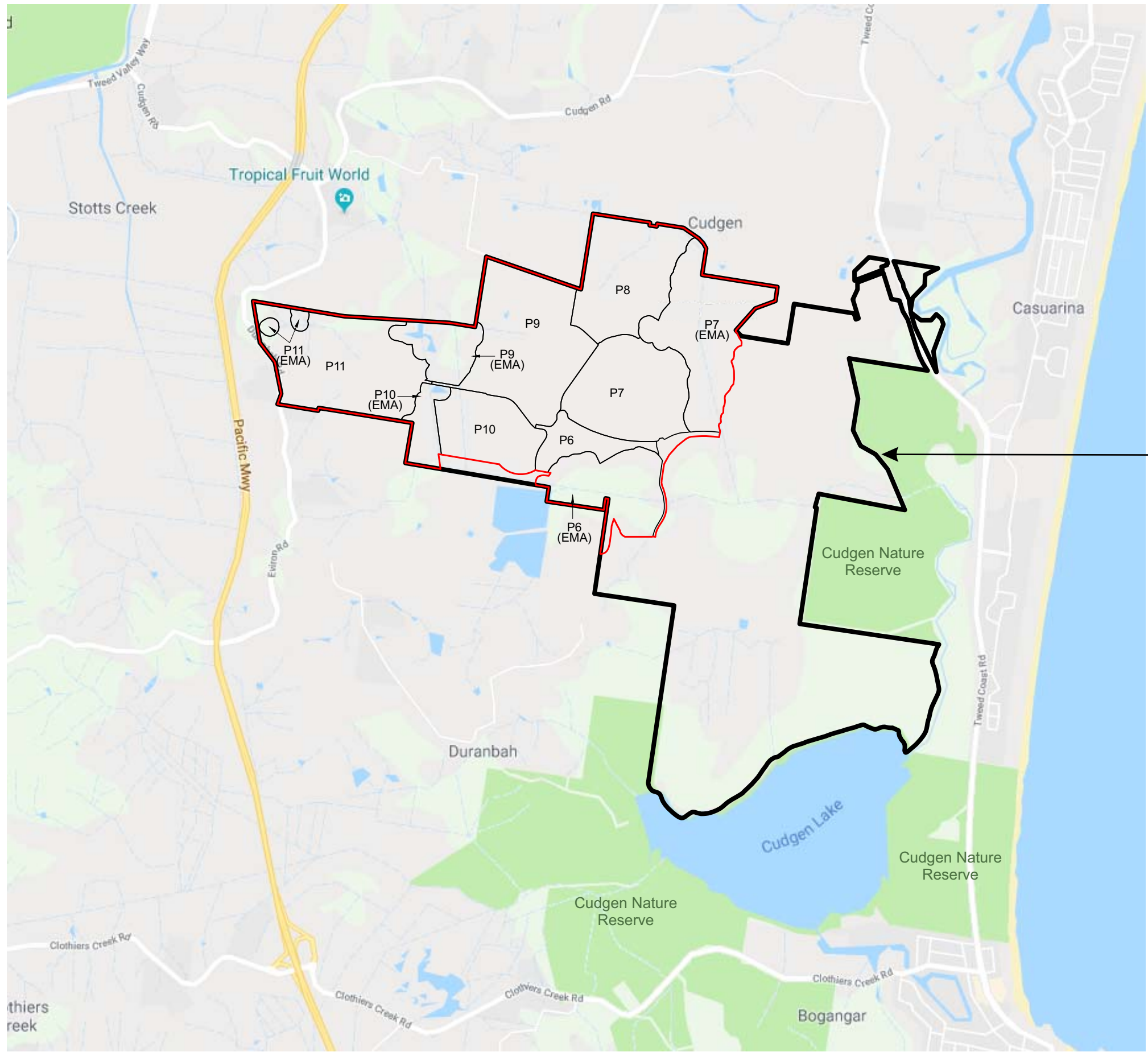
- Lot 76, 272, 323 and 326 in DP 755701;
- Lot 6 in DP 875446;
- Lot 2 in DP 819015;
- Lot 1 in DP 706497;
- Lot 40 in DP 7482;
- Lot 37A in DP 13727;
- Lot 38A in DP 13727;
- Lot 38B in DP 13727;
- Lot 1 in DP 129737;
- Lot 1 in DP 781633; and
- Lot 7 in DP 875447.

Project 28 Pty Ltd owns and manages the site which is currently used for cattle grazing and silviculture. The site consists of a mosaic of natural, partially natural, modified and regenerating plant communities including Heathland, Swamp sclerophyll (Paperbark) forest, Woodland, Pine plantation, Freshwater wetland and Pasture. The majority of the site is maintained as pasture for cattle grazing.

The Kings Forest site abuts agricultural and rural lands to the north, west and south west. Cudgen Nature Reserve (including Cudgen Lake and Cudgen Creek) abuts the site boundaries to the south and east. There are a small number of residential properties along Tweed Coast Road to the north of the site.

2.3 Conservation Reserves/Ecologically Significant Areas in the Locality

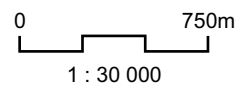
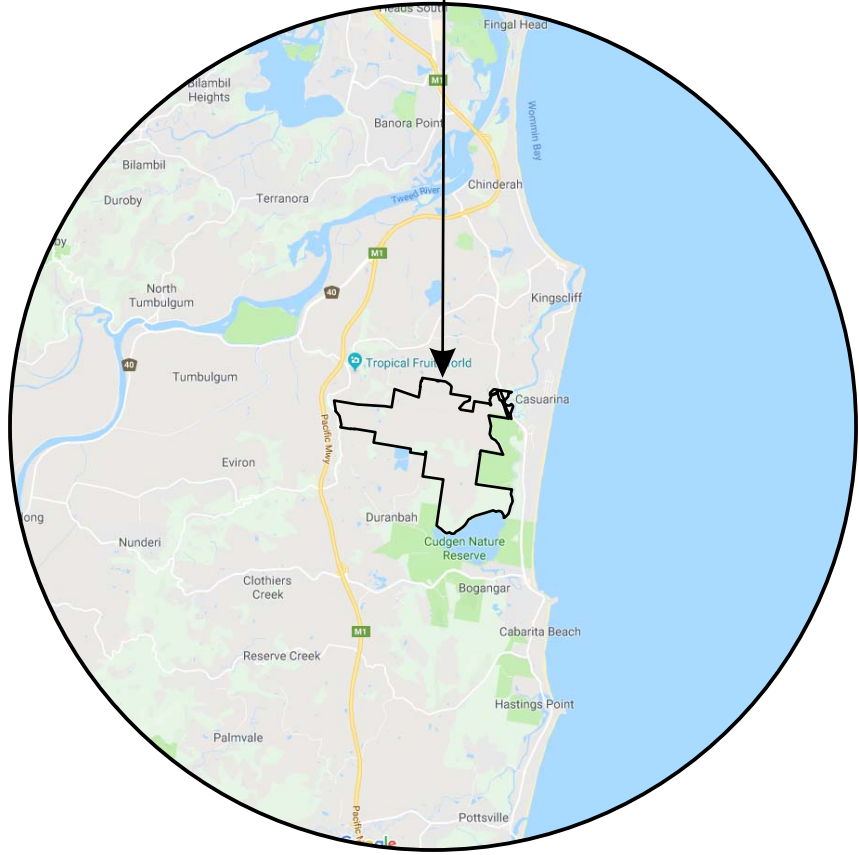
The Cudgen Nature Reserve adjoins the southern and (in part) eastern boundaries of the subject site (**FIGURE 2**). Stotts Island Nature Reserve is situated approximately 2 km to the north-west of the site.



LEGEND
[Red outline] Area Subject to this Management Plan
[Black outline] Kings Forest Boundary



SUBJECT SITE



SOURCE: Google Maps	CLIENT Project 28 Pty Ltd	FIGURE 1	TITLE LOCALITY PLAN
SCALE: 1 : 30 000 @ A3	PROJECT Threatened Species Management Plan Precincts 6 - 11 Kings Forest Melaleuca Drive, Duranbah, NSW Shire of Tweed		
JWA PTY LTD Ecological Consultants		PREPARED: BW DATE: 16 November 2020 FILE: N97017_Locality.cdr	



- LEGEND**
- Cudgen Nature Reserve
 - Area Subject to this Management Plan
 - Kings Forest Boundary

0 750m
1 : 30 000

SOURCE: NSW DPI Cadastre
Google Earth Apr 2017 Aerial
SCALE: 1 : 30 000 @ A3
JWA PTY LTD
Ecological Consultants

CLIENT
Project 28 Pty Ltd
PROJECT
Threatened Species Management Plan
Precincts 6 - 11 Kings Forest
Melaleuca Drive, Duranbah, NSW
Shire of Tweed

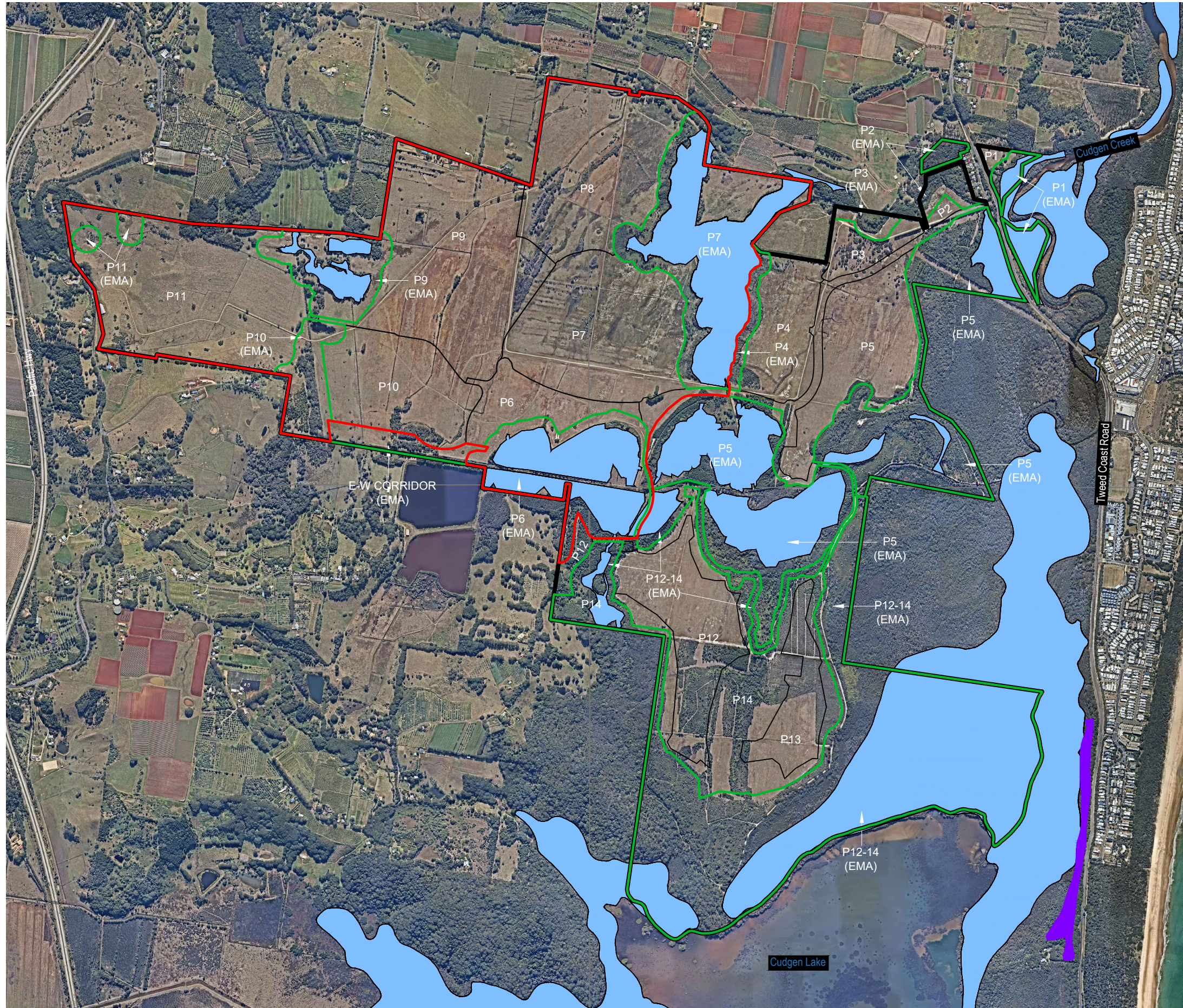
FIGURE 2
PREPARED: BW
DATE: 16 November 2020
FILE: N97017_Cudgen NR.cdr

TITLE
**CUDGEN
NATURE
RESERVE**

Several Freshwater wetland and Littoral Rainforest areas protected under the (superseded) State Environmental Planning Policy (SEPP) 14 (Coastal Wetlands) and SEPP 26 (Littoral Rainforests) exist within and near the site (**FIGURE 3**). These SEPPs have been superseded by State Environmental Planning Policy (SEPP) Coastal Management (2018). Whilst there are areas of discrepancy between the superseded and current SEPP wetland mapping on site, the wetlands generally occur in areas zoned for Environmental Protection on the NSW Planning SEPP Major Development 2005 - Kings Forest land zoning map (**FIGURE 4**). As all relevant approvals were granted prior to the gazettal of the Coastal Management SEPP reference to this mapping has not been shown to avoid confusion.

2.4 Land Use Zones

Land use zones over the Kings Forest development site are identified on the NSW Planning SEPP Major Development 2005 - Kings Forest land zoning map (**FIGURE 4**). SEPP 14 wetland areas, as well as a number of smaller wetland and Littoral rainforest parcels have been designated Environmental Protection (Wetlands and Littoral Rainforests) (7a) zones. Substantial buffer zones occur wherever the 2(c) lands abut neighbouring agricultural land (150 metres) and Environmental Protection zones (50 metre). Lands in the far south of the property are subject to clause 50b of the Tweed LEP, committing them to conservation. Apart from other smaller areas of Environmental Protection (Habitat) (7I), the remainder of the property is zoned Urban Expansion (2c).

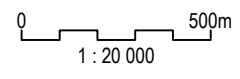


LEGEND

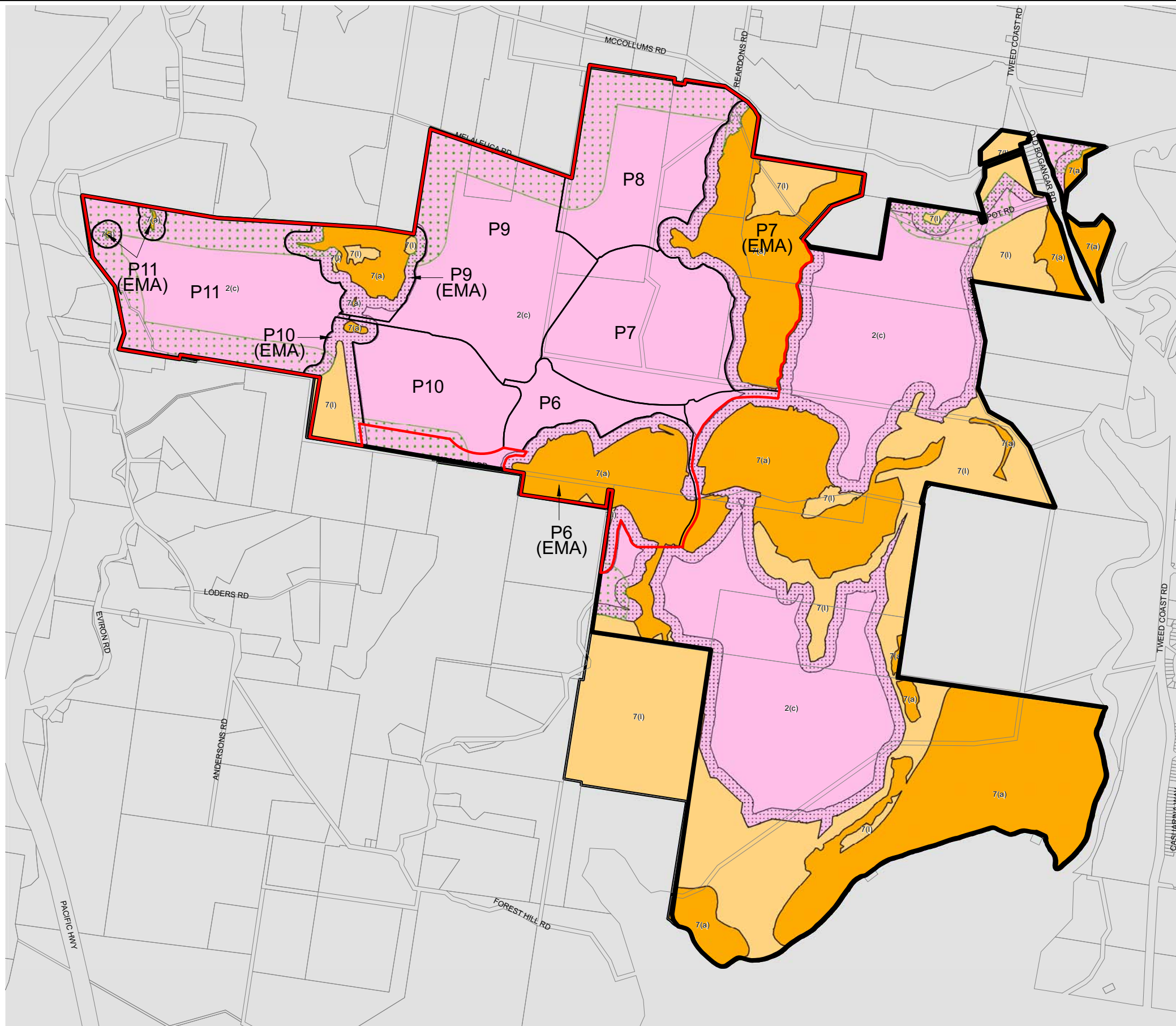
- SEPP 14 Coastal Wetlands (#1)
- SEPP 26 Littoral Rainforest (#1)
- Area Subject to this Management Plan
- Environmental Management Area (EMA) Boundary (#2)
- Precinct Boundary
- Kings Forest Boundary

Note 1:
These SEPP's have been superseded by State Environmental Planning Policy (SEPP) Coastal Management (2018). As all relevant approvals were granted prior to the gazettal of the Coastal Management SEPP, reference to the revised mapping has not been shown to avoid confusion.

Note 2:
To assist in identifying the staging of rehabilitation and management actions, EPZs and buffer areas have been associated with a relevant development precinct and are collectively titled as Environmental Management Areas (EMAs).



SOURCE: Landpartners - SEPP14 Wetlands (Amendment 15) & SEPP26 Littoral Rainforest; Near Map 08/08/18 Aerial SCALE: 1 : 20 000 @ A3		CLIENT Project 28 Pty Ltd PROJECT Threatened Species Management Plan Precincts 6- 11 Kings Forest Melaleuca Drive, Duranbah, NSW Shire of Tweed		FIGURE 3		TITLE SEPP No. 14 COASTAL WETLANDS & SEPP No. 26 LITTORAL RAINFOREST
JWA PTY LTD Ecological Consultants				PREPARED: BW DATE: 16 November 2020 FILE: N97017_MP6-11_20201116.dwg		



- LEGEND**
- Area Subject to this Management Plan
 - Kings Forest Boundary
- ZONING**
- 2(c) Urban Expansion
 - 7(a) Environmental Protection (Wetlands & Littoral Rainforests)
 - 7(l) Environmental Protection (Habitat)
 - Agricultural Buffer (150m)
 - Ecological Buffer (50m)

0 500m
1 : 20 000

SOURCE: NSW Planning SEPP (Major Development) 2005 - Kings Forest Land Zoning Map (Ref: SEPP_MD_KIF_LZN_001_20100201)
SCALE: 1 : 20 000 @ A3
JWA PTY LTD
Ecological Consultants

CLIENT
Project 28 Pty Ltd
PROJECT
Threatened Species Management Plan
Precincts 6 - 11 Kings Forest
Melaleuca Drive, Duranbah, NSW
Shire of Tweed

FIGURE 4

PREPARED: BW
DATE: 16 November 2020
FILE: N97017_Zoning.cdr

TITLE
ZONING PLAN

3 PROPOSED DEVELOPMENT

3.1 Background

The Kings Forest project is a master planned residential community. The total area of the proposed development is 422.32 ha and will include the following in accordance with the Concept Plan Approval (as modified Mods 1 to 5):

- Residential development for approximately 4500 dwellings;
- Town centre and neighbourhood centre for future retail and commercial uses;
- Community and education facilities;
- Employment land;
- 18 hole Golf Course;
- Open space;
- Wildlife corridors;
- Protection and rehabilitation of environmentally sensitive land;
- Utility services infrastructure;
- Water management areas and lake; and
- Roads and pedestrian and bicycle paths.

The proposed development comprises a total of fourteen (14) separate precincts (**FIGURE 5**) and development of the site will be completed on a precinct-by-precinct basis.

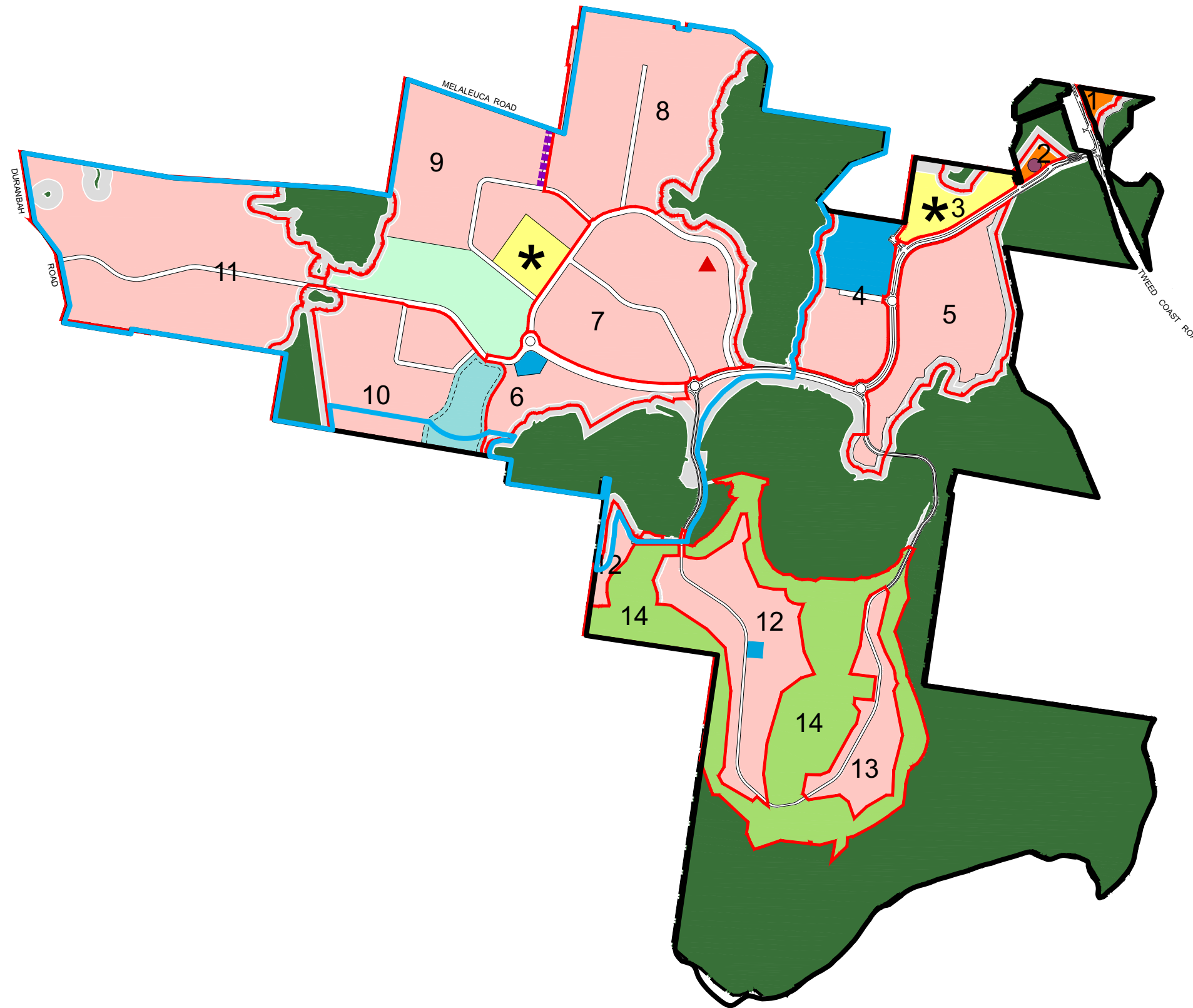
Retained vegetation and habitat areas across the site generally occur within Environmental Protection Zones (EPZs) and associated buffers. To assist in identifying the staging of rehabilitation and management actions, these EPZ and buffer areas have been associated with a relevant development precinct and are collectively titled as Environmental Management Areas (EMAs). Works within EMAs will be completed in accordance with the staging of the associated Precinct.

Precincts 6 - 11 are the subject of this TSMP and occur in the central and western portions of the Kings Forest development site.

3.2 Precinct Descriptions

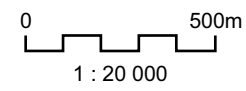
3.2.1 *Precinct 6*

Precinct 6 occurs in the central portion of the Kings Forest site at the western end of the proposed Kings Forest Parkway. A small area in the north of Precinct 6 is proposed to be developed as a Town/Neighbourhood Centre whilst the remainder of the precinct is proposed to be developed as a residential precinct. An EPZ and associated 50 m buffer zone occur to the south of Precinct 6 (collectively referred to as the Precinct 6 EMA) in which no development works are proposed. Works within the Precinct 6 EMA will include:



- LEGEND**
- Area Subject to this Management Plan
 - Precinct Boundary
 - Kings Forest Boundary
- PRECINCT PLAN**
- Town Centre / Neighbourhood Centre
 - Residential
 - Community Facilities / Education
 - Employment Land
 - Structured Open Space (Active)
(Passive open space to council standards, location subject to urban design)
 - Environmental Protection Area
 - 50m Ecological Buffer
(Includes APZs & roads where approved)
 - * State School Site
 - Proposed Zone Substation
(Subject to Country Energy final approval)
 - ▲ Potential Affordable Housing Location
 - Potential Road Connection to Melaleuca Road
 - Private Open Space
 - Golf Course Area
(Encompassing ecological buffers where indicated)
 - Private Open Space including lake

IMPORTANT NOTE
 This plan was prepared as a preliminary concept plan for planning purposes only. As such all particulars, including lot design, areas and densities, are subject to detailed survey, site investigations and to the requirements of council and any other authority which may have requirements under any relevant legislation.
 This note is an integral part of this plan.



SOURCE: RPS Precinct Plan Rev B dated 05/12/13 (Ref: 113691-PSP-4b(PRECINCT PLAN).dwg) SCALE: 1 : 20 000 @ A3 JWA PTY LTD Ecological Consultants	CLIENT Project 28 Pty Ltd PROJECT Threatened Species Management Plan Precincts 6 - 11 Kings Forest Melaleuca Drive, Duranbah, NSW Shire of Tweed	FIGURE 5 PREPARED: BW DATE: 16 November 2020 FILE: N97017_Precinct Plan.cdr	TITLE PRECINCT PLAN
---	--	---	-------------------------------

- Protection and maintenance of retained vegetation in accordance with the following documents where applicable:
 - Precincts 6 - 11 VWMP (JWA 2020a) - Section 6.7;
 - Kings Forest KPoM (JWA 2019) - Section 7.5;
 - Kings Forest WSFMP (JWA 2020b) - Section 7.7; and
- Regeneration/revegetation works (including compensatory koala and WSF habitat creation and regeneration/revegetation of heath and wetland communities) in accordance with the following documents where appropriate:
 - Precincts 6 - 11 VWMP (JWA 2020a) - Section 6.9;
 - Kings Forest KPoM (JWA 2019) - Section 7.6; and
 - Kings Forest WSFMP (JWA 2020b) - Section 7.8.

3.2.2 Precinct 7

Precinct 7 is located in the central portion of the Kings Forest site, to the west of the northern SEPP wetland. Precinct 7 is proposed to be developed as a residential precinct. An EPZ and associated 50 m buffer zone occur to the east of Precinct 7 (containing the northern SEPP wetland and collectively referred to as the Precinct 7 EMA) within in which no development works are proposed. Works within the Precinct 7 EMA will include:

- Protection and maintenance of retained vegetation in accordance with the following documents where applicable:
 - Precincts 6 - 11 VWMP (JWA 2020a) - Section 6.7;
 - Kings Forest KPoM (JWA 2019) - Section 7.5;
 - Kings Forest WSFMP (JWA 2020b) - Section 7.7; and
- Regeneration/revegetation works (including compensatory koala and WSF habitat creation and regeneration/revegetation of heath and wetland communities) in accordance with the following documents where appropriate:
 - Precincts 6 - 11 VWMP (JWA 2020a) - Section 6.9;
 - Kings Forest KPoM (JWA 2019) - Section 7.6; and
 - Kings Forest WSFMP (JWA 2020b) - Section 7.8.

3.2.3 Precinct 8

Precinct 8 is located in the central northern portion of the Kings Forest site, to the west of the northern SEPP wetlands. Precinct 8 is proposed to be developed as a residential precinct. A large EPZ and associated 50 m buffer occurs to the east of Precinct 8 in which no development works are proposed. It is noted that the EPZ and associated 50 m ecological buffer to the east of Precinct 8 are included in the EMA associated with Precinct 7 (discussed above).

3.2.4 Precinct 9

Precinct 9 occurs in the north-western portion of the Kings Forest site. The northern portion of Precinct 9 is proposed to be developed as a residential precinct while the southern portion is proposed to be developed as a Community Facility/Education precinct and Structure Open Space (Active) area. An EPZ and associated 50 m buffer zone occur to the west of Precinct 9 (collectively referred to as the Precinct 9 EMA) in which no development works are proposed. Works within the Precinct 9 EMA will include:

- Protection and maintenance of retained vegetation in accordance with the following documents where applicable:
 - Precincts 6 - 11 VWMP (JWA 2020a) - Section 6.7;
 - Kings Forest KPoM (JWA 2019) - Section 7.5; and
- Regeneration/revegetation works (including compensatory koala habitat creation and regeneration/revegetation of heath communities) in accordance with the following documents where appropriate:
 - Precincts 6 - 11 VWMP (JWA 2020a) - Section 6.9; and
 - Kings Forest KPoM (JWA 2019) - Section 7.6.

3.2.5 Precinct 10

Precinct 10 is located in the western portion of the Kings Forest site. The western portion of Precinct 10 is proposed to be developed as a residential precinct whilst the eastern portion will contain a Private Open Space area including a lake. An EPZ and associated 50 m buffer zone occur to the west of Precinct 10 (collectively referred to as the Precinct 10 EMA) in which no development works are proposed. Works within the Precinct 10 EMA will include:

- Protection and maintenance of retained vegetation in accordance with the following documents where applicable:
 - Precincts 6 - 11 VWMP (JWA 2020a) - Section 6.7;
 - Kings Forest KPoM (JWA 2019) - Section 7.5; and
- Regeneration/revegetation works (including compensatory koala habitat creation and regeneration/revegetation of heath communities) in accordance with the following documents where appropriate:
 - Precincts 6 - 11 VWMP (JWA 2020a) - Section 6.9; and
 - Kings Forest KPoM (JWA 2019) - Section 7.6.

It should be noted that an area to the immediate south of Precinct 10 has been allocated to the proposed East-West Corridor which will link the Precincts 6 and 10 EPZs and bolster movement/dispersal corridors in this portion of the Kings Forest site. The proposed East-West Corridor is designated as a koala compensatory habitat area. This area is outside the scope of this TSMP and is covered separately as part of the Precincts 1 - 5 VWMP (JWA 2020f).

3.2.6 Precinct 11

Precinct 11 occurs in the far west of the Kings Forest site and is proposed to be developed as a residential precinct. Two (2) small EPZs and associated 50 m buffer zones occur in the north west of the precinct (collectively referred to as the Precinct 11 EMAs) in which no development works are proposed. Works within the Precinct 11 EMA will include wetland regeneration/revegetation works in accordance with Section 6.9 of the Precincts 6 - 11 VWMP (JWA 2020a).

3.3 Development Staging

The Kings Forest project will likely proceed over many years. The length of time will be dependent, to a certain degree, on the demand for land over time. The development of the site will be completed on a precinct-by-precinct basis in accordance with approved Precinct Plan (**FIGURE 5**), however this may be subject change. In relation to Precincts 6 - 11 (i.e. the subject of this TSMP), indicative staging is shown in **TABLE 1**.

TABLE 1
INDICATIVE DEVELOPMENT STAGING

Development Stage	Precinct
Stage 3	Precinct 6
Stage 4	Precinct 7
Stage 5	Precinct 8
Stage 6	Precinct 9
Stage 7	Precinct 10
Stage 8	Precinct 11

4 EXISTING SITE VALUES

4.1 Introduction

The following sections detail the existing ecological values contained within Precincts 6 - 11 and associated EMAs. An aerial photograph of Precincts 6 - 11 and associated EMAs is shown in **FIGURE 6**.

4.2 Vegetation

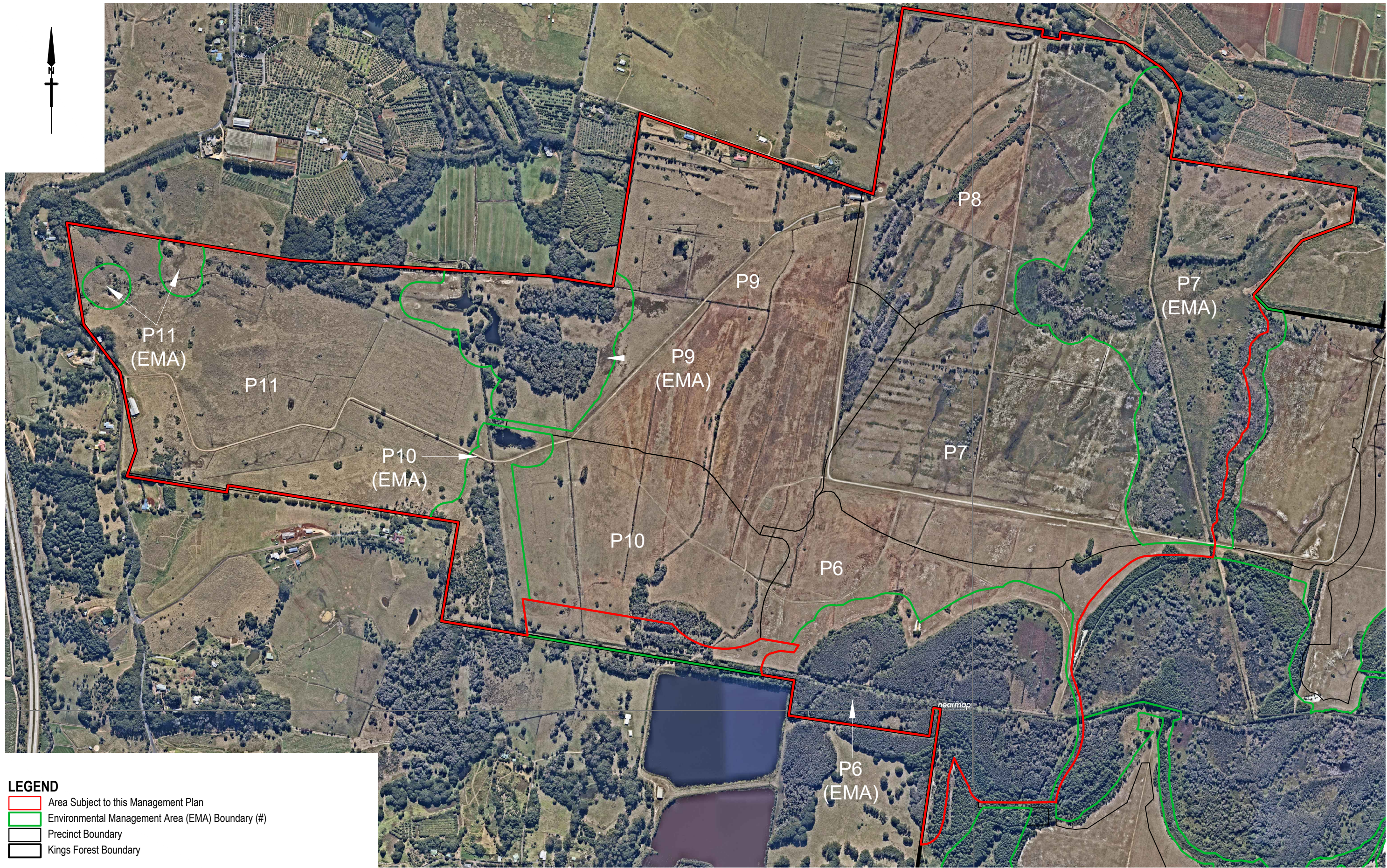
The Kings Forest site has a decades-long history of various land uses and land management practices, including pine plantation, sand mining, pasture improvement and turf production, dairy farming, small cropping and sugar cane production. It is presently used generally for cattle grazing. Over many years the land has been extensively cleared for these activities. There remain, however, large areas of undisturbed vegetation in the eastern and south-eastern portions of the property and within wetland areas throughout. These areas of the site are generally zoned for Environment Protection.

Vegetation at the subject site has been described in varying degrees of detail (Warren 2000, Kingston *et al.* 2004, Callaghan *et al.* 2005). The most comprehensive vegetation mapping over the Kings Forest site was completed by the Australian Koala Foundation (Callaghan *et al.* 2005). However, harvesting of areas of pine plantation, continued infestation of native vegetation with Slash pine (*Pinus elliottii*) wildings and areas of natural heath regeneration has occurred since the preparation of this map.

FIGURE 7 shows the vegetation communities occurring over Precincts 6 - 11 and associated EMAs (as at July 2019) and has been adapted from the Callaghan *et al.* (2005) mapping combined with detailed re-mapping/ground-truthing surveys completed by JWA between 2010 - 2019. In total, five (5) broad vegetation types have been mapped within Precincts 6 - 11 and associated EMAs:

- Highly modified vegetation communities;
- Freshwater wetlands;
- Heathland and shrublands;
- Swamp sclerophyll floodplain forests; and
- Rainforest.

Vegetation community descriptions in this TSMP, including proposed offset/compensatory habitat areas, are discussed in relation to their closest Plant Community Type (PCT) descriptions which were accessed via the Biodiversity and Conservation Division (BCD) (formerly OEH) of the Environment, Energy and Science Group in the NSW DPI&E database (i.e. the BioNet Vegetation Classification System). PCTs are classified based on vegetation types occurring within the Interim Biogeographic Regionalisation for Australia (IBRA) subregions, as developed by the Commonwealth government. The IBRA framework divides Australia landscapes into bioregions and subsequently subregions based on common features such as climate, geology, landform, and vegetation.



- LEGEND**
- Area Subject to this Management Plan
 - Environmental Management Area (EMA) Boundary (#)
 - Precinct Boundary
 - Kings Forest Boundary

Note:
To assist in identifying the staging of rehabilitation and management actions, EPZs and buffer areas have been associated with a relevant development precinct and are collectively titled as Environmental Management Areas (EMAs).

0 300m
1 : 10 000

SOURCE: Near Map 08/08/18 Aerial	CLIENT Project 28 Pty Ltd	FIGURE 6	TITLE AERIAL PHOTOGRAPH
SCALE: 1 : 10 000 @ A3	PROJECT Threatened Species Management Plan Precincts 6- 11 Kings Forest Melaleuca Drive, Duranbah, NSW Shire of Tweed		
JWA PTY LTD Ecological Consultants		PREPARED: BW DATE: 16 November 2020 FILE: N97017_MP6-11_20201116.dwg	

#1 Note: To assist in identifying the staging of rehabilitation and management actions, EPZs and buffer areas have been associated with a relevant development precinct and are collectively titled as Environmental Management Areas (EMAs).

#2 Note: Vegetation mapping has been adapted from the Australian Koala Foundation (Callaghan *et al.* 2005) mapping combined with detailed re-mapping/ground-truthing surveys completed by JWA between 2010 - 2018.

LEGEND

- Area Subject to this Management Plan
- Environmental Management Area (EMA) Boundary (#1)
- Precinct Boundary
- Kings Forest Boundary

VEGETATION COMMUNITIES (#2)

Community 1 - Highly Modified

- 1(a) Substantially cleared of native vegetation
- 1(b) Camphor laurel dominant closed forest (with rainforest species)
- 1(e1) Exotic pine plantation
- 1(e2) Exotic pine plantation (with heathland species)
- 1(f) Exotic grassland dominated (with heathland species)
- 1(g) Exotic grassland dominated (with regrowth Acacia & other native species)
- 1(h) Exotic pines with sedgeland/rushland/fernland
- 1(i) Exotic pines with swamp sclerophyll floodplain forest

Community 2 - Freshwater Wetland

- 2(a) Hillside seepage swamp (with *Eleocharis tetraquetra*) [PCT 1911, TVMS 701]
- 2(b) Ponds & fringing wetland [PCT 1911, TVMS 701]
- 2(c1) Sedgeland/rushland/fernland [PCT 1911, TVMS 701/702]
- 2(c2) Sedgeland/rushland/fernland (with exotic pines) [PCT 1911, TVMS 701/702]

Community 3 - Heathland & Shrubland

- 3(d) Regenerating wet/dry coastal heathland to shrubland [PCT 1297, TVMS 501/5022]
- 3(e) Regenerating wet/dry coastal heathland to shrubland (with exotic pines) [PCT 1297, TVMS 501/502]

Community 4 - Swamp Sclerophyll Floodplain Forest

- 4(b) Swamp mahogany open forest to woodland & heathland species [PCT 1230, TVMS 305]

- 4(e) Broad-leaved paperbark closed forest to woodland [PCT 1064, TVMS 401]
- 4(f) Broad-leaved paperbark closed forest to woodland (with Scribbly gum) [PCT 1064, TVMS 401]
- 4(g2) Broad-leaved paperbark closed forest to woodland (with rainforest species & camphor laurel) [PCT 1064, TVMS 401]
- 4(h) Broad-leaved paperbark closed forest to woodland/Swamp mahogany open forest to woodland [PCT 1064, TVMS 403]
- 4(j1) Regenerating Broad-leaved paperbark closed forest to woodland & heathland species [PCT 1064, TVMS 403]

Community 6 - Rainforest

- 6(b) Regenerating sub-tropical rainforest [PCT 1302, TVMS 102]
- Open water

0 1 : 10 000 300m

SOURCE: JWA Site Investigations 2018;
Near Map 08/08/18 Aerial

SCALE: 1 : 10 000 @ A3

JWA PTY LTD
Ecological Consultants

CLIENT
Project 28 Pty Ltd
PROJECT
Threatened Species Management Plan
Precincts 6- 11 Kings Forest
Melaleuca Drive, Duranbah, NSW
Shire of Tweed

FIGURE 7

PREPARED: BW
DATE: 16 November 2020
FILE: N97017_MP6-11_20201116.dwg

TITLE

VEGETATION
COMMUNITIES

It is noted however that PCT descriptions are still undergoing revision and many remain undescribed for the SEQ03 - Burringbar-Conondale Ranges IBRA subregion. Therefore, corresponding Tweed Vegetation Management Strategy 2004 (TVMS) codes have also been provided.

4.3 Endangered Ecological Communities

Two (2) Endangered Ecological Communities (EECs) as defined by the NSW *Biodiversity Conservation Act 2016* (BC Act) have been mapped within Precincts 6 - 11 and associated EMAs (**FIGURE 8**):

- Freshwater wetlands on coastal floodplains of the NSW North Coast; and
- Swamp sclerophyll forest on coastal floodplains of the NSW North Coast.

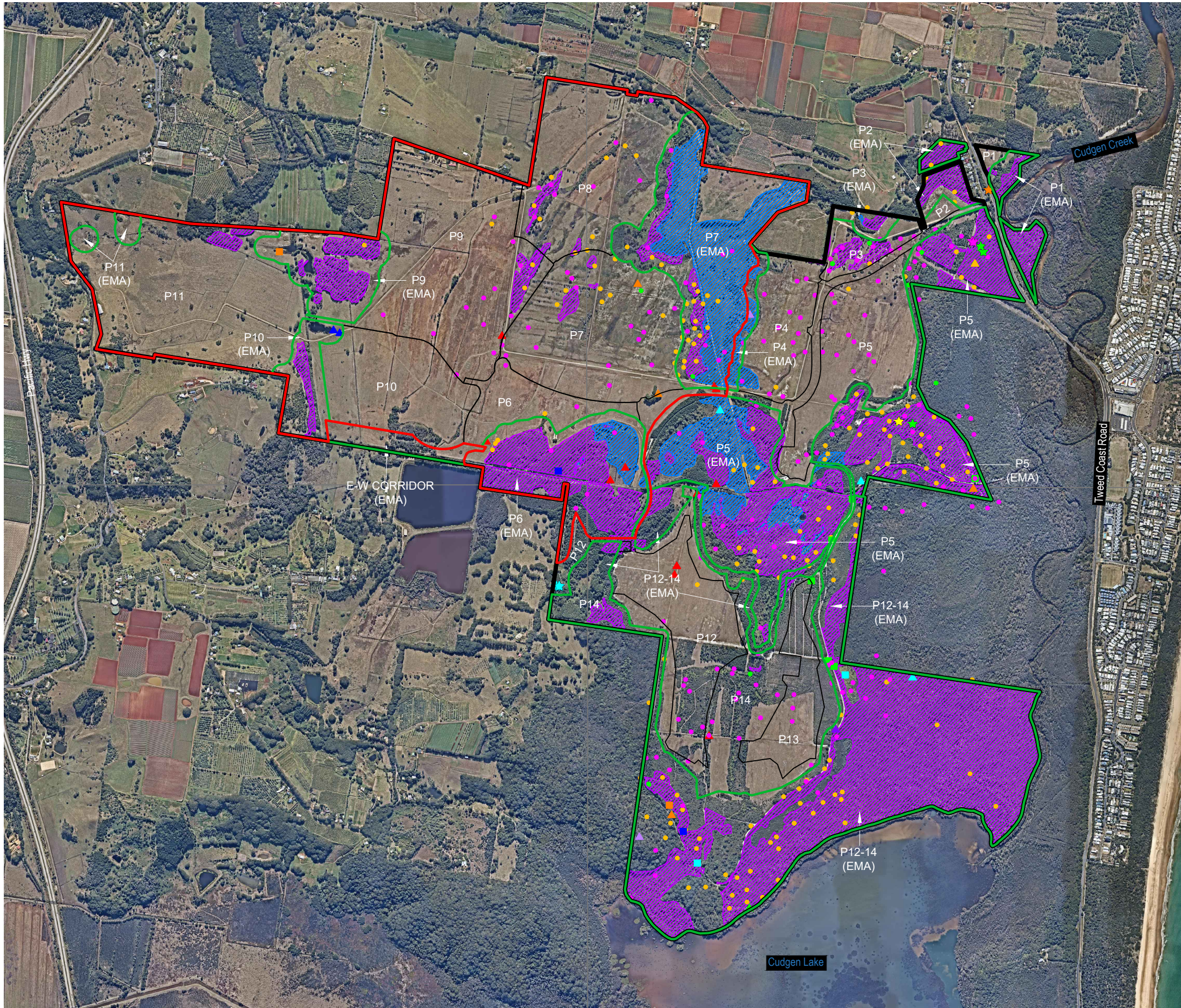
Descriptions of these EEC's are provided in **APPENDIX 3**.

4.4 Threatened Species and Habitat Values

A number of threatened flora and fauna species have been recorded across the Kings Forest site over the last 30 years. Current and historical records of these threatened species are shown in **FIGURE 8**.

TABLE 2 lists the threatened flora and fauna species which have been recorded within Precincts 6 - 11 and associated EMAs. Also included in **TABLE 2** are species which are known to occur within the wider Kings Forest site and are considered to be provided with suitable habitat within the Precincts 6 - 11 and associated EMAs. The conservation status of each species listed in **TABLE 2** is shown in accordance with the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and the NSW *BC Act*.

TABLE 2 also summarises the suitable habitat occurring within Precincts 6 - 11 and associated EMAs for each species. These habitat areas are depicted in **FIGURES 9 - 15**. Species profiles for the threatened flora and fauna species listed in **TABLE 2** including description, habitat requirements, status, existing and potential threats, recovery strategies are provided in **APPENDICES 4 and 5** respectively.



LEGEND

- Area Subject to this Management Plan
- Environmental Management Area (EMA) Boundary (#)
- Precinct Boundary
- Kings Forest Boundary

THREATENED FLORA RECORDS

- Green-leaved rose walnut (*Endiandra muelleri* subsp. *bracteata*) - Endangered (BC Act 2016)
- Southern swamp orchid (*Phaius australis*) - Endangered (BC Act 2016 & EPBC Act 1999)
- Stinking cryptocarya (*Cryptocarya foetida*) - Vulnerable (BC Act 2016 & EPBC Act 1999)
- White laceflower (*Archidendron hendersonii*) - Vulnerable (BC Act 2016)
- White yiel yiel (*Grevillea hilliana*) - Endangered (EPBC Act 1999)

THREATENED FAUNA RECORDS

Birds

- Black bittern (*Ixobrychus flavicollis*) - Vulnerable (BC Act 2016)
- Black-necked stork (*Ephippiorhynchus asiaticus*) - Endangered (BC Act 2016)
- Bush stone-curlew (*Burhinus grallarius*) - Endangered (BC Act 2016)
- Glossy-black cockatoo (*Calyptorhynchus lathami*) - Vulnerable (BC Act 2016)
- Grass owl (*Tyto longimembris*) - Vulnerable (BC Act 2016)
- Masked owl (*Tyto novaehollandiae*) - Vulnerable (BC Act 2016)
- Osprey (*Pandion haliaetus*) - Vulnerable (BC Act 2016)
- Pale-vented bush hen (*Amouronis moluccana*) - Vulnerable (BC Act 2016)

Mammals

- Common blossom bat (*Syconycteris australis*) - Vulnerable (BC Act 2016)
- Common planigale (*Planigale maculata*) - Vulnerable (BC Act 2016)
- Grey-headed flying-fox (*Pteropus poliocephalus*) - Vulnerable (BC Act 2016 & EPBC Act 1999)
- Koala (*Phascolarctos cinereus*) - Vulnerable (BC Act 2016 & EPBC Act 1999)
- Yellow-bellied sheathail bat (*Saccolaimus flaviventris*) - Vulnerable (BC Act 2016)

Amphibians

- Wallum froglet (*Crinia tinnula*) - Vulnerable (BC Act 2016)
- Wallum sedge frog (*Litoria longburnensis*) - Vulnerable (BC Act 2016 & EPBC Act 1999)

ENDANGERED ECOLOGICAL COMMUNITIES

- Freshwater wetlands on coastal floodplains of the NSW North Coast
- Swamp sclerophyll forest on coastal floodplains of the NSW North Coast

Note:

To assist in identifying the staging of rehabilitation and management actions, EPZs and buffer areas have been associated with a relevant development precinct and are collectively titled as Environmental Management Areas (EMAs).

0 500m
1 : 20 000

SOURCE: Landpartners - SEPP14 Wetlands (Amendment 15) & SEPP26 Littoral Rainforest; Near Map 08/08/18 Aerial

SCALE: 1 : 20 000 @ A3

JWA PTY LTD
Ecological Consultants

CLIENT
Project 28 Pty Ltd

PROJECT
Threatened Species Management Plan
Precincts 6- 11 Kings Forest
Melaleuca Drive, Duranbah, NSW
Shire of Tweed

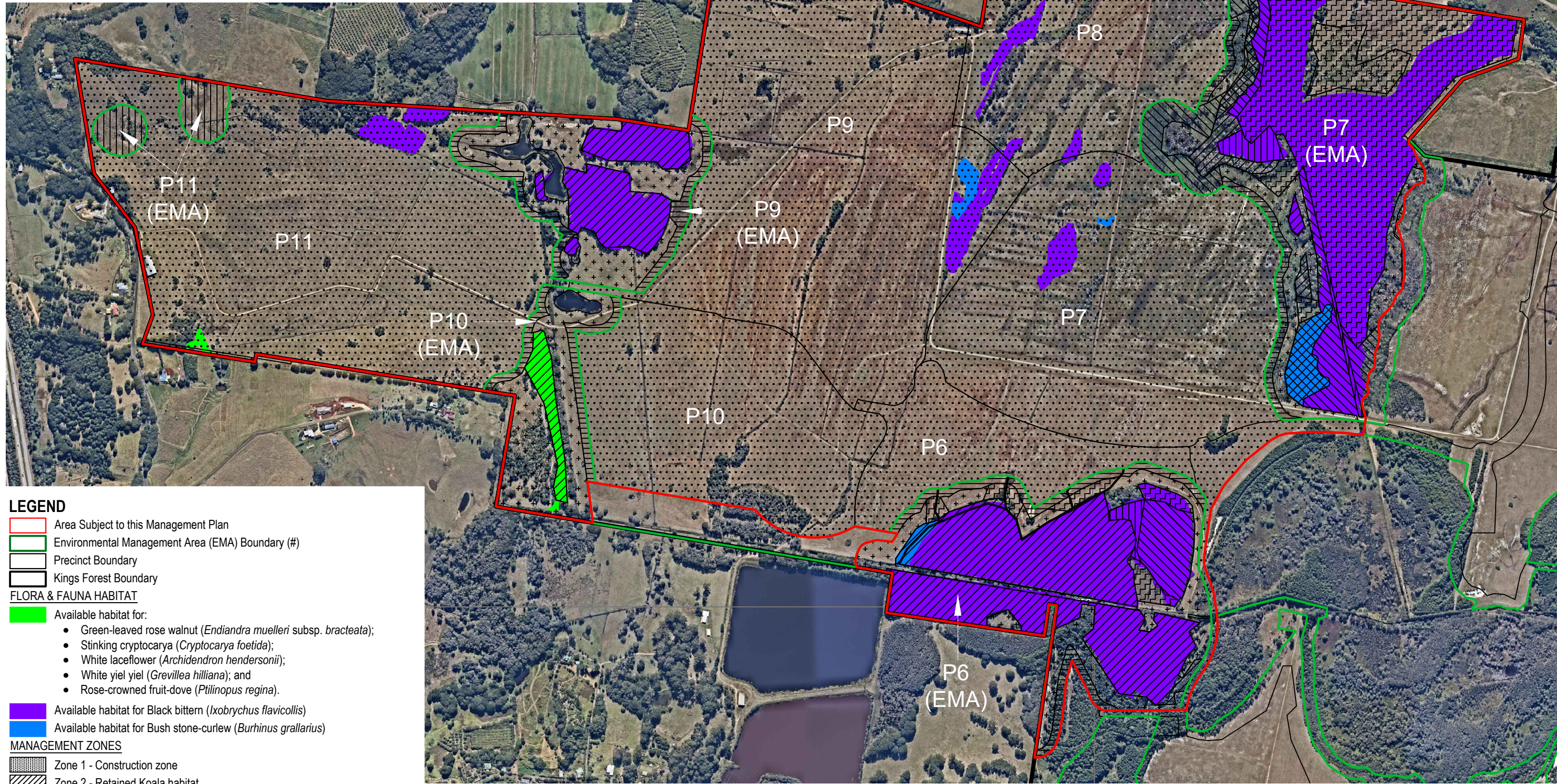
FIGURE 8

PREPARED: BW
DATE: 16 November 2020
FILE: N97017_MP6-11_20201116.dwg

TITLE
THREATENED
FLORA & FAUNA RECORDS
& ENDANGERED
ECOLOGICAL
COMMUNITIES



#1 Note:
To assist in identifying the staging of rehabilitation and management actions, EPZs and buffer areas have been associated with a relevant development precinct and are collectively titled as Environmental Management Areas (EMAs).



- LEGEND**
- Area Subject to this Management Plan
 - Environmental Management Area (EMA) Boundary (#)
 - Precinct Boundary
 - Kings Forest Boundary

- FLORA & FAUNA HABITAT**
- Available habitat for:
- Green-leaved rose walnut (*Endiandra muelleri* subsp. *bracteata*);
 - Stinking cryptocarya (*Cryptocarya foetida*);
 - White laceflower (*Archidendron hendersonii*);
 - White yiel yiel (*Grevillea hilliana*); and
 - Rose-crowned fruit-dove (*Ptilinopus regina*).

- Available habitat for Black bittern (*Ixobrychus flavicollis*)
- Available habitat for Bush stone-curlew (*Burhinus grallarius*)

- MANAGEMENT ZONES**
- Zone 1 - Construction zone
 - Zone 2 - Retained Koala habitat
 - Zone 3 - Retained WSF habitat
 - Zone 4 - Koala compensatory habitat
 - Zone 5 - WSF compensatory habitat
 - Zone 6 - Heath regeneration/revegetation
 - Zone 8 - Wetland regeneration

0 1 : 10 000 300m

SOURCE: JWA Site Investigations 2018, Near Map 08/08/18 Aerial	CLIENT Project 28 Pty Ltd	FIGURE 9	TITLE HABITAT FOR BLACK BITTERN, BUSH STONE-CURLEW, GREEN-LEAVED ROSE WALNUT, ROSE-CROWNED FRUIT-DOVE, STINKING CRYPTOCARYA, WHITE LACEFLOWER & WHITE YIEL YIEL
SCALE: 1 : 10 000 @ A3	PROJECT Threatened Species Management Plan Precincts 6- 11 Kings Forest Melaleuca Drive, Duranbah, NSW Shire of Tweed		
JWA PTY LTD Ecological Consultants		PREPARED: BW DATE: 16 November 2020 FILE: N97017_MP6-11_20201116.dwg	