


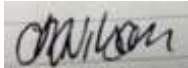
**Conservation Area  
Management Plan  
Mather Reserve (53163)  
and Lot 24 Mary Street,  
Wanneroo**

**23 Jun 2020**

## Quality Information

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|--------------------|---|
| <b>Document</b>    | Conservation Area Management Plan         |
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| <b>Date</b>        | 23 June 2020                              |
| <b>Prepared by</b> | Tenaha Wilson                             |
| <b>Reviewed by</b> | Claire Johnson/Kylie Payne/Kirsten Thrush |

## Revision History

| Rev | Revision Date | Details                        | Authorised   |   |
|-----|---------------|--------------------------------|--|---|
|     |               |                                | Name/Position  | Signature   |
| A   | 19 July 2018  | Draft for Internal Review      |  |   |
| B   | 23-Jul-2018   | Draft for Internal Review      |  |   |
| C   | 27-Jul-2018   | Draft for Client Review        | Linda Kirchner<br>Team Lead - IAP &<br>Natural Resources,<br>AECOM   |   |
| D   | 17-Aug-2018   | Draft for Client Review        | Linda Kirchner<br>Team Lead - IAP &<br>Natural Resources,<br>AECOM   |   |
| E   | 05-Sep-2018   | Draft for Internal Review      | Linda Kirchner<br>Team Lead - IAP &<br>Natural Resources,<br>AECOM   |   |
| 0   | 06-Sep-2018   | For Issue                      | Linda Kirchner<br>Team Lead - IAP &<br>Natural Resources,<br>AECOM   |   |
| 1   | 13-Sep-2018   | For Issue - Minor<br>Amendment | Linda Kirchner<br>Team Lead - IAP &<br>Natural Resources,<br>AECOM   |  |
| 2   | 28-Feb-2020   | Draft for DAWE Review          | Tenaha Wilson<br>Natural Area<br>Assets Officer, City<br>of Wanneroo |   |
| 3   | 23-Jun-2020   | Final                          | Tenaha Wilson<br>Natural Area<br>Assets Officer, City<br>of Wanneroo |  |

## DECLARATION OF ACCURACY

I declare that:

1. To the best of my knowledge, all the information contained in, or accompanying this Conservation Area Management Plan Revision 2 – 28-Feb-2020 is complete, current and correct.

2. I am duly authorised to sign this declaration on behalf of the approval holder.

3. I am aware that:

a. Section 490 of the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act) makes it an offence for an approval holder to provide information in response to an approval condition where the person is reckless as to whether the information is false or misleading.

b. Section 491 of the EPBC Act makes it an offence for a person to provide information or documents to specified persons who are known by the person to be performing a duty or carrying out a function under the EPBC Act or the *Environment Protection and Biodiversity Conservation Regulations 2000* (Cth) where the person knows the information or document is false or misleading.

c. The above offences are punishable on conviction by imprisonment, a fine or both.

**Signed**



**Full name (please print)**

Benny Chang (Manager Asset Planning)

**Organisation (please print)**

City of Wanneroo

Date 24/06/2020

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## 1.0 Introduction

### 1.1 Status of the Conservation Area Management Plan

This Conservation Area Management Plan (CAMP) document examines the threats, management and mitigation measures applicable to the conservation areas associated with the City of Wanneroo's Meridian Business Park development. The conservation areas at Mather Reserve and that located at Mary Street are offset sites, in accordance with environmental approval conditions, selected due to the presence of characteristics favourable to the Carnaby's Black Cockatoo, listed as endangered under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Environmental management for the Meridian Business Park development is addressed in the approved CEMP (AECOM, 2018).

Since the original CAMP was approved, a number of changes have been made to the document to bring it up to date with current practice. These changes are presented in Table 1.

Table 1 - Relevant updates to this CAMP since 2016

| Topic                           | Description   | Reference   |
|---------------------------------|---|---|
| Property boundaries             | Update to reflect approved changes to property boundaries as well as the change in land ownership and the gazetted name for Mather Reserve.                                     | Section 1.2                                       |
| Environment Description         | Updated section to be specific to the offset areas and incorporated recent technical site surveys   | Section 2.0                                       |
| Roles and responsibilities      | Updated roles and responsibilities for key milestones of the CAMP management actions  | Section 3.2.2                                     |
| Environmental management        | Modification of the more prescriptive methodologies found within this section   | Section 4.0                                       |
| Pest Fauna management           | While retaining the objective of reducing the impact to Carnaby's Black Cockatoo, this section has been expanded to include pest species in addition to rabbits                 | Section 4.3                                       |
| Carnaby's cockatoo management   | Amendment to Carnaby's Black Cockatoo management to remove requirement for salvage of hollows, following results of Black Cockatoo Habitat Survey.                              | Section 2.0 and Section 4.4                       |
| Vegetation Condition Management | Update the management, monitoring and contingency actions and rehabilitation species to increase priority on achieving an improved cockatoo foraging habitat within Mary Street | Section 4.6.2 - 3                                 |
| Maps and definitions            | Updated maps and references to maps in relation the update of Conditions 1- 3 and relevant definitions  | Conditions 1 & 3; definitions and Schedules 1 - 3 |

### 1.2 Background

The City of Wanneroo (the City) received approval in 2014 for the development of the Meridian Business Park, Neerabup. Meridian Business Park is located off Flynn Drive within the Neerabup Industrial Area (NIA), situated approximately 30 km north of the Perth Central Business District (Figure 1). The proposed Meridian Business Park site has been allocated under the Agreed Structure Plan 17 for the development. The land allocated consists of Lot 8001 Flynn Drive, Lot 9100 (formerly Lot 9000) and 9003 Mather Drive and Part Lot 600 Wattle Avenue, Neerabup. These Lots comprise the Development Area as well as the gazetted Mather Reserve (Lot 8001 Flynn Drive, Neerabup), which is one of the two environmental conservation areas reserved for this development as shown in Figure 2. The second of the two conservation areas is located at Lot 24 Mary St, Wanneroo as shown in Figure 1. The project is expected to be undertaken in stages over the next 20 to 30 years and includes resource extraction, development of general industrial lots and longer term strategic employment options.

The City engaged environmental consultants to perform an environmental assessment of its landholdings within the NIA and develop an environmental offset package that was presented to the

relevant Government Authorities. The City received approval with conditions in July 2014 (EPBC 2007/3479), under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) from the Department of the Environment (DotE), now the Department of Agriculture, Water and Environment (DAWE). As a requirement of their EPBC Act approval, the City was required to submit a Construction Environmental Management Plan (CEMP) and a CAMP to the DAWE Minister for approval at least three (3) months before construction of Development Area commences.

The agreed offset package is split across two zones, comprising of a 50 ha onsite conservation area (Mather Reserve) and a 4 ha offsite offset area in Mary Street, Wanneroo. The primary objective of the Offset Sites is to conserve the value of breeding and foraging habitat for the Carnaby's Black Cockatoos. Definitions of key areas for the CAMP are listed in Table 2.

Table 2 - Area Definitions

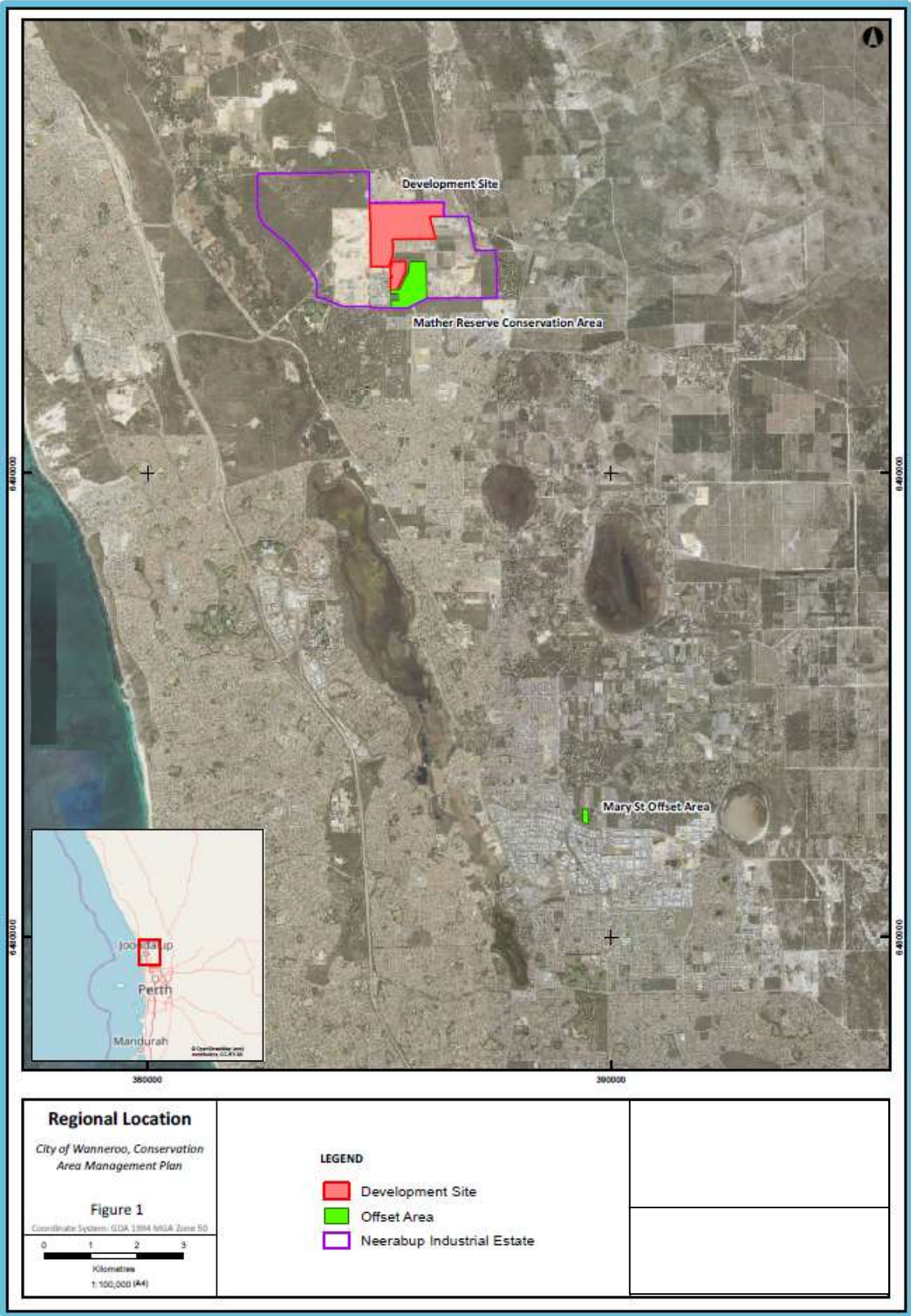
| Area                    | Description   |
|-------------------------|---|
| The NIA                 | Neerabup Industrial Area  |
| The Development Area    | Meridian Business Park (land to be developed 159 ha)  |
| Mather Reserve          | Onsite offset area (50 ha), gazetted as Mather Reserve (R 53163). Referred in EPBC 2007/3479 and previous revisions of the CAMP as the Conservation Area. |
| The Mary Street Reserve | Offsite offset area (4 ha)  |
| The Offset Sites        | Mather Reserve and the Mary Street Reserve  |

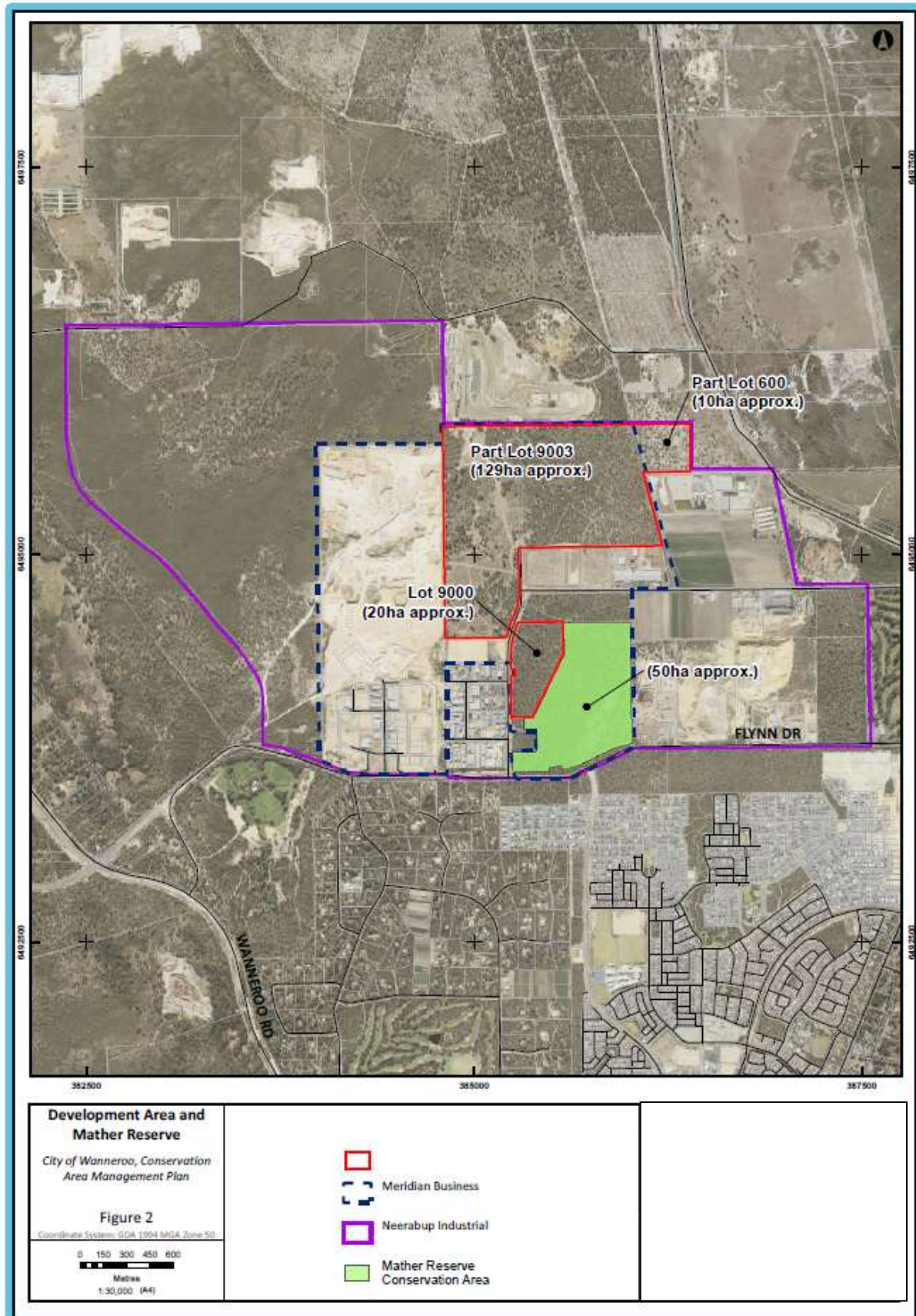
### 1.3 Approvals and Management Objectives

This CAMP will be used to assist the City by outlining environment management actions to implement the offset package for the Meridian Business Park development, covering both Offset Sites (Figure 2). The CAMP includes the management actions as specified in Condition 3 of the EPBC Act Approval. These include:

- Description of the offset areas including zoning and tenure arrangements;
- Objectives, targets and completion criteria for revegetation programs to increase Black Cockatoo foraging habitat at the Mary Street offset Site;
- Fencing and access management;
- Management measures to control weeds, *Phytophthora* dieback, erosion and dust
- Timeframes and implementation of the above measures; and
- Descriptions of the roles and responsibilities of personnel associated with implementing each of the above measures









## 2.0 Description of the Environment

The description of the environment is specific to each of the identified offset locations. The documents included in Table 3 were used to inform this section of the CAMP.

Table 3 - History of Surveys undertaken

| Survey  | Author / Issued by                                | Year /Ref |
|---|---|-----------|
| <b>Neerabup Industrial Area: Vegetation and Flora Surveys</b>                           | RPS Bowman Bishaw Gorham (RPS)                    | 2006      |
| <b>Flora, vegetation and vertebrate fauna assessment Neerabup Industrial Area (NIA)</b> | ATA Environmental (ATA)                           | 2007      |
| <b>Flora and Fauna Survey of Flynn Drive for City of Wanneroo, Perth</b>                | Coffey Environmental (Coffey)                     | 2008      |
| <b>Ground truthing of environmental values for Lot 4 Flynn Drive Neerabup</b>           | Eco Logical Australia (ELA)                       | 2012      |
| <b>Targeted Flora and Fauna Assessment Lot 4 Flynn Drive Neerabup.</b>                  | Eco Logical Australia                             | 2013      |
| <b>Flynn Drive – Lot 9000 Neerabup Fauna Survey</b>                                     | Animal Pest Management Services (APMS)            | 2016a     |
| <b>Mary Street Lot 24 Wanneroo Offset Site Fauna Survey</b>                             | Animal Pest Management Services                   | 2016b     |
| <b>Level 2 Flora and Vegetation Assessment of Conservation Offset Areas</b>             | Terratree   | 2016      |
| <b>Phytophthora Dieback Assessment of Conservation and Development Areas</b>            | Terratree   | 2017      |
| <b>City of Wanneroo Weed Mapping Report Lot 9000 Flynn Drive</b>                        | Natural Area Consulting Management Services (NAC) | 2017a     |
| <b>City of Wanneroo Weed Mapping Report Lot 24 Mary Street</b>                          | Natural Area Consulting Management                | 2017b     |
| <b>Black Cockatoo Habitat Survey Report - Neerabup Industrial Area and Offset Sites</b> | Terrestrial Ecosystems                            | 2018      |
| <b>Final Flora Survey Mary Street and Mather reserve</b>                                | Ecoscope  | 2018a     |
| <b>Final Kangaroo Survey Neerbaup</b>   | Ecoscope  | 2018b     |
| <b>Report Mather Reserve (Rabbits)</b>  | Animal Pest Management Services                   | 2018      |
| <b>Final Flora Survey Mary Street and Mather reserve</b>                                | Ecoscope  | 2020a     |
| <b>Black Cockatoo Habitat Survey Report - Neerabup Industrial Area and Offset Sites</b> | Ecoscope  | 2020b     |

### 2.1 Mather Reserve

#### 2.1.1 Land Use Context

As shown in Figure 2, the City of Wanneroo's Meridian Business Park site comprises two primary components. The development area (159 ha) and the onsite conservation area, gazetted as Mather Reserve (R53163) (50 ha), shown in Figure 3. The combined area is surrounded by land zoned for Industrial Development, Parks and Recreation, State Forests, and various Rural purposes. The surrounding land uses and site boundaries are summarised below in Table 4.

Table 4 - Surrounding Land Use

| Direction    | Description  |
|--------------|--|
| <b>North</b> | Barbagallo Raceway, native vegetation                      |
| <b>South</b> | Flynn Drive, industrial development, native vegetation     |
| <b>East</b>  | Native vegetation, rural land holdings                     |
| <b>West</b>  | Mather Drive, link to freeway extension, quarry operations |

### 2.1.2 Native Flora and Vegetation

Mather Reserve, comprising approximately 50 ha of native vegetation in Very Good to Excellent condition and providing high quality foraging habitat for Carnaby's Black Cockatoo, was originally zoned as Industrial land. This land also includes part of Bush Forever Site No. 295, which was designated as a Strategic Negotiated Planning Solution requirement in the Bush Forever program (Government of WA, 2000). This categorisation requires an outcome that balances the conservation and development scenarios.

The 2012 flora and vegetation survey identified that Mather Reserve contained 15.2 ha of the State listed Threatened Ecological Community (TEC) FCT SCP 20a – *Banksia attenuata* woodlands over species rich dense shrublands (ELA, 2012).

During the 2016 vegetation and flora survey of Mather Reserve two Priority flora individuals were recorded: Priority 2 *Acacia benthamii* and Priority 3 *Stylidium maritimum*. The survey mapped one vegetation community within Mather Reserve, which is representative of the Banksia Woodlands of the Swan Coastal Plain TEC due to the presence of key diagnostic species.

### 2.1.3 Weeds

Weed mapping was conducted within the Offset Areas in 2016 as part of the spring flora and vegetation survey (Terratree, 2016). A total of 22 weed species were recorded within the Offset Sites, representing 15.5% of total floristic diversity.

Weed species were found to occur at low densities within Mather Reserve and generally consisted of non-aggressive species such as *\*Briza maxima* and *\*Gladiolus caryophyllaceus*. One aggressive weed species *\*Arctotheca calendula* (Cape Weed) was recorded on introduced soil piles, however no spread beyond these areas was observed (Terratree, 2016). *\*Leptospermum laevigatum* (Victorian Tea Tree) was recorded within roadside vegetation adjacent to Mather Reserve.

No Weeds of National Significance or Declared Pests for the City of Wanneroo LGA, in accordance with the *Biosecurity and Agricultural Management Act 2007* (BAM Act), were identified within Mather Reserve.

Targeted weed mapping was undertaken within the Offset Areas by NAC in June 2017, during the germination and active growth period of the following four weed species (NAC, 2017):

- Geraldton Carnation Weed (*Euphorbia terracina*);
- Rose Pelargonium (*Pelargonium capitatum*);
- Perennial Veldt Grass (*Ehrharta calycina*); and
- Blackberry Nightshade (*Solanum nigrum*) .

Although Geraldton Carnation Weed is not a Declared Weed it is increasingly invasive in the Swan Natural Resource Management (NRM) Region and like other *Euphorbia* species, Geraldton Carnation Weed contains a toxic milky white sap in the leaves and stems.

Within Mather Reserve the targeted weed survey determined that the majority of weed infestations are restricted to the perimeter, with no high density infestations (greater than 75% cover) recorded (NAC, 2017). Five other non-target weed species were identified, as listed below:

- Victorian Tree (*Leptospermum laevigatum*);
- Geraldton Wax (*Chamelaucium uncinatum*);
- Castor Oil (*Ricinus communis*) – located just outside the reserve;
- Pig Face (*Carpobrotus edulis*) – low density (<5% coverage), low priority species; and
- Pink Gladiolus (*Gladiolus caryophyllaceus*) – low density (<5% coverage), low priority species.

### 2.1.4 Fauna

In September 2016, APMS (2016a) undertook a fauna baseline survey, which identified native animals within Mather Reserve, including several kangaroos and bandicoot activity (tracks and digging). The survey was undertaken at night, using spotlights to identify fauna activity. No evidence of rabbit activity

was found during this survey.

Foxes were identified in the baseline survey, which was followed up by a fox control program in November 2016. APMS trapped and removed two adult female foxes, with a high probability for a third (male) to remain in the Site.

#### 2.1.4.1 Carnaby's Black Cockatoo

Mather Reserve contains high value foraging habitat for Carnaby's Black Cockatoo, characterised by *Banksia attenuata*, *B. menzeisii*, *Allocasuarina fraseriana* and *Eucalyptus marginata* species (Terratree, 2016).

A total of 93 trees that satisfied the Commonwealth guidelines were recorded in Mather Reserve during the survey. These trees were all Jarrah (*Eucalyptus marginata*) (Ecoscape, 2020). In addition to recording tree characteristics according to the Commonwealth guidelines, each potential breeding tree was assessed (Ecoscape, 2020) for habitat value using a scoring system developed by Dr Mike Bamford (2016), as follows:

- 4 x Class 3 trees - Potentially suitable hollow visible but no chew marks present; or potentially suitable hollow present (as suggested by structure of tree, such as large, vertical trunk broken off at a height of >10m);
- 20 x Class 4 trees - Tree with large hollows or broken branches that might contain large hollows, but hollows or potential hollows are not vertical or near-vertical; thus, a tree with or likely to have hollows of sufficient size but not to have hollows of the angle preferred by Black Cockatoos; and
- 69 x Class 5 trees - Tree lacking large hollows or broken branches that might have large hollows; a tree with more or less intact branches and a spreading crown.

Mary Street Reserve did not record any trees that satisfied the Commonwealth guidelines (i.e. no tree had a sufficient DBH size) (Ecoscape, 2020).

## 2.2 Mary Street Reserve

### 2.2.1 Land Use Context

The second of the Offset Sites is located at Lot 24 Mary Street, Wanneroo (Mary Street Reserve), which comprises a 4 ha property currently surrounded by industrial, residential and rural properties (Figure 4). The land is currently zoned for rural purposes and will be rezoned for conservation.

### 2.2.2 Native Flora and Vegetation

The vegetation condition within Mary Street Reserve ranges from Good to Excellent, with one vegetation type mapped: Woodland of *Allocasuarina fraseriana*, *Banksia attenuata* and *Banksia menzeisii* over *Hibbertia hypericoides*, *Hovea stricta* and *Billardiera fraseri* Closed Low Heath (Terratree, 2016). This vegetation was determined to be representative of the *Banksia* Woodlands of the Swan Coastal Plain TEC due to the presence of key diagnostic species.

### 2.2.3 Weeds

During the 2016 flora and vegetation survey (Terratree, 2016), aggressive weed species were recorded within Mary Street Reserve including:

- \**Ehrharta calycina* (Veldt Grass);
- \**Watsonia meriana* var. *bulbillifera* (Watsonia); and
- \**Pelargonium capitatum* (Pelargonium).

Non-aggressive weed species observed to be widespread throughout Mary Street Reserve, including \**Briza maxima* and \**Gladiolus caryophyllaceus*.

No Weeds of National Significance were identified within Mary Street Reserve, however a small population of *Watsonia* was recorded. *Watsonia* is listed as High Priority for management in the Swan Region NRM weed prioritisation strategy, and has been nominated for inclusion as a Weed of National Significance (Terratree, 2016).

No Declared Pests for the City of Wanneroo LGA, in accordance with the BAM Act 2007, were identified within Mary Street Reserve.

Targeted weed mapping was undertaken by NAC in June 2017, during the germination and active growth period of the four target species listed in section 2.1.3 (NAC, 2017). All four species were identified in the survey, with Perennial Veldt Grass as the most common species. Mary Street Reserve had been recently burnt at the time of survey, potentially resulting in future increases in weed density and variety to that recorded during the targeted survey.

#### 2.2.4 Fauna

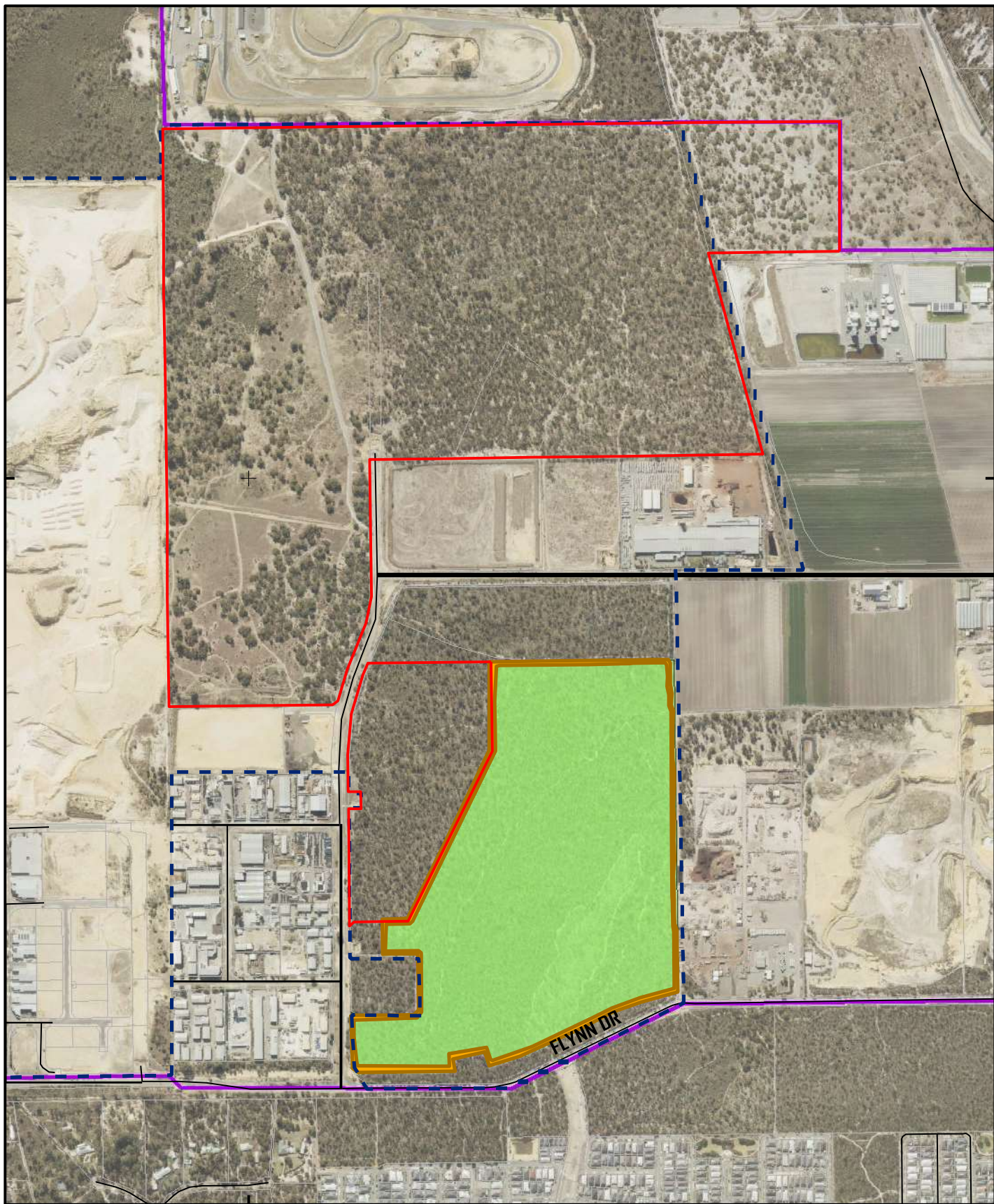
A baseline fauna survey completed by APMS (2016b) showed little to no fauna activity within the Mary Street Reserve. The survey was conducted over two nights with no sightings or evidence of native or pest fauna (rabbits, kangaroos, foxes, bandicoots) in the site.

##### 2.2.4.1 Carnaby's Black Cockatoo

The Mary Street Reserve contains high value foraging habitat for Carnaby's Black Cockatoo characterised by *Banksia attenuata*, *B. menziesii*, *Allocasuarina fraseriana* and *Eucalyptus marginata* species (Terratree, 2016).

Site 7 (Mary Street) did not record any trees that satisfied the Commonwealth guidelines (i.e. no tree had a sufficient DBH size) (Ecoscape, 2020). Several Jarrah individuals on the eastern boundary of Mary Street Reserve are of sufficient size to potentially develop breeding hollows in the future. The nearest known Carnaby's Black Cockatoo breeding population occurs near the Yanchep National Park, more than 16 km away, and it is unlikely that Carnaby's Black-Cockatoos would nest within Mary Street Reserve (Terrestrial Ecosystems, 2018).



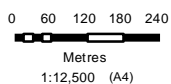


### Mather Reserve Conservation Area

City of Wanneroo, Conservation Area Management Plan

Figure 3

Coordinate System: GDA 1994 MGA Zone 50



### LEGEND

- Development Site
- Meridian Business Park
- Neerabup Industrial Area
- Firebreaks
- Mather Reserve Conservation Area

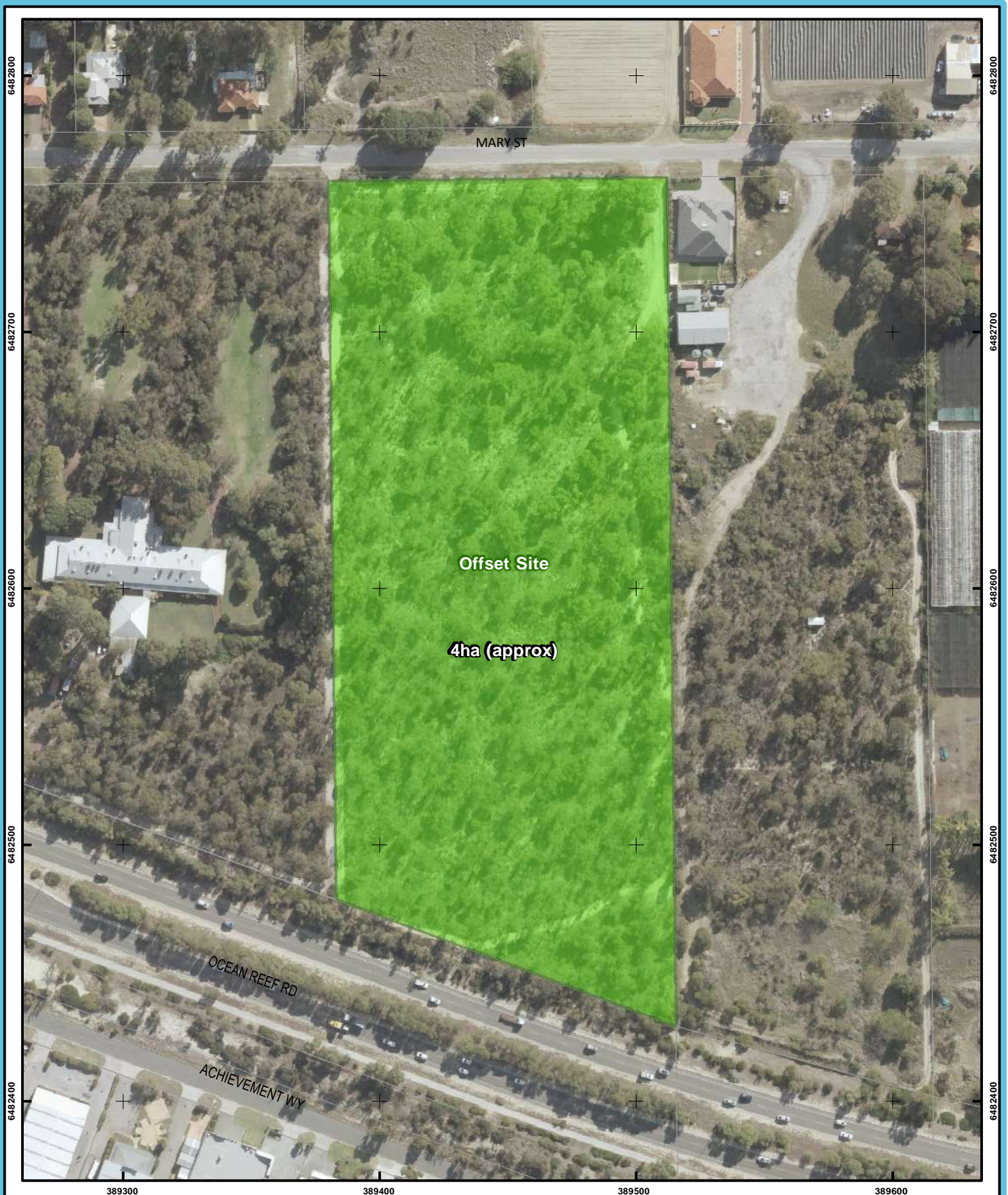
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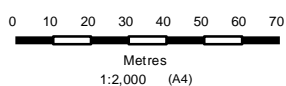


## Mary Street Reserve

City of Wanneroo, Conservation  
Area Management Plan

Figure 4

Coordinate System: GDA 1994 MGA Zone 50



### LEGEND

Mary St Offset Site

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## 3.0 Implementation of the CAMP

### 3.1 Overview

Mather Reserve has been protected by the transfer of land to the Crown and change of zoning from industrial use to conservation tenure. The transfer of Mary Street Reserve to the Crown for the purposes of Conservation is in progress.

This CAMP has been prepared to outline management actions to maintain and increase the value of Mather Reserve and Mary Street Reserve for Carnaby's Black Cockatoo foraging habitat. These offset sites are to be managed in accordance with this CAMP which addresses:

- Fencing and access management;
- Bushfire management (including the establishment and maintenance of firebreaks);
- Weed control;
- Dust control and erosion management;
- Revegetation; and
- Monitoring.

### 3.2 Key Milestones

#### 3.2.1 Relevant Documentation

The key documentation relevant to this CAMP is listed in Table 5.

**Table 5 - Relevant Documentation, Registers and Reports**

| Reference / Title                          | Author / Issued by | Details  |
|--|--------------------|--|
| EPBC 2007/3479                             | DotE               | EPBC Act approval for the Site portion of the Meridian Business Park         |
| Construction Environmental Management Plan | AECOM, June 2015   | Management plan for construction activities as required under EPBC 2007/3479 |
| Environmental Review                       | Eco Logical, 2013  | Environmental Impact Assessment of the Meridian Business Park Site           |

#### 3.2.2 Roles and Responsibilities

The management of the Offset Sites will be undertaken in accordance with this CAMP. It is essential that all personnel associated with the Offset sites comply with the requirements of all applicable environmental legislation, regulations, codes of practice and standards are adhered to. The City is responsible for the overall implementation of the CAMP under the EPBC Act Approval and conditions. The key roles relevant to the implementation of the CAMP are presented in Table 6.

**Table 6 - Environmental Management Roles**

| Position             | Appointed by | Description of Role  |
|----------------------|--------------|--|
| Project Manager (PM) | The City     | <p>Ensure compliance of all parties with the CAMP and EPBC 2007/3479.</p> <p>This role is responsible for the long term implementation of the development of the Meridian Business Park landholdings held by The City.</p> <p>This role also liaises with the Environmental Specialists to ensure the implementation of all management actions within both the CEMP and CAMPs.</p> |

|  |          |  |
|--|----------|--|
| Environmental Specialists<br>(Project Officer, Technical Officer Conservation & Natural Area Assets Officer) | The City | <p>These are specific roles required to be responsible for the implementation of the CAMP during the project, including for implementing the management and monitoring actions set out in this CAMP.</p> <p>The Project Officer will ensure that all new conservation activities and rehabilitation are implemented within the Conservation Areas, in accordance with CAMP. This role works cooperatively and in consultation with the Project Manager and Natural Areas Assets Officer.</p> <p>The Technical Officer Conservation will ensure that all ongoing conservation maintenance (feral animal and weed control) is implemented within the Conservation Areas, in accordance with CAMP. This role works cooperatively and in consultation with the Project Officer.</p> <p>The Natural Area Assets Officer will ensure that all environmental legislation and other obligations associated with this CAMP are approved, understood and communicated with all relevant key internal and external stakeholders. This role works cooperatively and in consultation with the Project Manager and Environmental Projects Officer.</p> |
| Construction Contractor (CC)   | PM       | <p>Appointed by the PM as part of a tender process for the CEMP. The CC includes all contractors its nominated sub-contractors. The CC is responsible for ensuring that the environmental and other contractual obligations contained in the tender Contract between the City and the CC are met. This includes any impacts which may directly or indirectly impact on the Offset sites.</p>   |

Actions relevant to implementing this plan are provided within the Management Sub-Plans, included in Section 4.0 of the CAMP. A summary of relevant management milestones is listed in Table 7.

Table 7 - Key Milestone Actions and Responsibilities

| Ref   | Description   | Timing  | Status   | Responsibility                            |
|---|---|---|----------|---|
| Table 8 Protection of Offset Sites  |   |   |          |   |
| 2.1   | Mather Reserve is to be surveyed and fenced prior to the commencement of clearing activities of the Development Area.   | Prior to clearing   | Complete | Project Manager                           |
| 2.2   | Mather Reserve is to be consolidated into a single block of land. The consolidated block is then to become a dedicated conservation reserve, or a conservation covenant is to be placed on the freehold title.                              | Within 2 years of the commencement of the action  | Complete | Project Manager                           |
| 2.3   | The Mary Street Reserve to be fenced prior to rehabilitation and management activities  |   |          | Project Officer                           |
| 2.4   | The Mary Street Reserve is to be rezoned to reflect its use as conservation zone or equivalent  |   |          | Project Manager                           |
| Table 9 Hygiene management plan to control weeds and Phytophthora dieback |   |   |          |   |
| 2.1   | Conduct baseline surveys of Mather Reserve and Mary Street Reserve to determine the current level of weed and Phytophthora dieback infestation.   | Prior to clearing   | Complete | Natural Areas Assets Officer              |
| Table10 Dust and erosion management                                       |   |   |          |   |
| 2.1   | Develop and implement the site specific dust management plan (DMP) for all stages of the Development Area in accordance with State guidelines (DEC 2011) and as outlined in the approved Construction Environmental Management Plan (CEMP). | Prior to commencing clearing and during clearing and maintenance activities within the Development Area |          | Project Manager / Construction Contractor |
| 2.2   | Upgrade Conservation Area sand tracks to formalised gravel tracks   |   | Complete | Project Officer                           |
| 2.3   | Upgrade Conservation Area tracks to include berms to mitigate erosion and ensure that the drainage on the site is not altered   |   | Complete | Project Officer                           |
| Table 11 Pest Fauna control management                                    |   |   |          |   |
| 2.1   | No pest fauna populations within the Offset Sites.  | Within 2 years of the commencement of the action  | Ongoing  | Technical Officer Conservation            |

Conservation Area Management Plan - Mather Reserve (53163) and Lot 24 Mary Street, Wanneroo  
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| Table 12 Carnaby's Black Cockatoo habitat management plan |   |                                 |          |                 |
|---|---|---------------------------------|----------|-----------------|
| 2.1   | Ensure Conservation Area established prior to the commencement of construction activities in the Development Area.  | Prior to clearing               | Complete | Project Manager |
| Table 14 Vegetation condition management plan             |   |                                 |          |                 |
| 2.1   | Maintain vegetation condition within Mather Reserve and improve vegetation condition within Mary Street Reserve through a program of weed control and condition monitoring. | Following approval of this plan | Ongoing  | Project Officer |
| 2.2   | Collect seed from the Development Area prior to clearing and use in Offset Sites.   | Prior to commencing clearing    | Ongoing  | Project Officer |

This CAMP is intended to guide both the establishment of the Offset Sites and the maintenance of these sites by the City in perpetuity. An indicative schedule showing the timing of the initial establishment of the Offset Sites is outlined in Section 6.0. The establishment of the Offset Sites will occur over a three year period with a two year contingency period. Following this the monitoring as presented in Section 4.5.7 will continue every two years to ensure the ongoing management of Mather Reserve and Mary Street Reserve as environmental offsets.

Specific timeframes for each action within the CAMP are provided within Section 4.0. A number of key milestones are required to be completed by the City, such as actions to occur prior to clearing or within a specified timeframe. Tracking of each action, including implementation timing and deadlines, will be conducted through the establishment of a CAMP Implementation Register which will be managed by the City.

### **3.2.3 Reporting**

The City is responsible for annual reporting under Condition 7 of the EPBC 2007/3479, which is required within three months of every 12 month anniversary of the commencement of the action. The report published to the City's website will demonstrate compliance against all conditions of the approval, including implementation of the management plans as specified by the conditions.

The City will collate information for the completion of the annual compliance report against this CAMP. All documents held for the purpose of tracking will be recorded within a Document Register to be maintained by the City.

The City will confirm that environmental protection measures undertaken are appropriate and effective and will provide a compliance report to DAWE on an annual basis and reported in accordance with approval conditions.

### **3.2.4 Document Revision**

The revised CAMP, once approved by the Commonwealth Minister for the Environment (or delegate), may not be modified or updated without further approval from the Minister, or the Minister's delegate. However, there may be occasions when review and amendment of the CAMP will be required. These include:

- Identification of opportunities for improvement;
- Recommendations arising from audits and monitoring;
- Change in operations or activities; and
- Change in legislation.

The implementation of this CAMP will be monitored and any revisions recommended at an annual formal management review by the City. Unless there is a significant issue that requires urgent attention, reviews and revisions of the CAMP should be limited to the annual formal management review.

Following the formal management review, any proposed updates to the CAMP will be reported to the Minister for approval.

## **4.0 Environmental Management**

### **4.1 Access Management**

Mather Reserve shares a boundary with areas to be cleared and developed within the southern portion of the site. As such control of access to Mather Reserve will be required to prevent/reduce impacts from uncontrolled access. The Mary Street Reserve will also require fencing for access management.

There are a number of potential impacts that may occur in the Offset Sites if the access is not properly managed. These include:

- Damage to existing vegetation from public recreational use, such as 4WD vehicles or motorbikes;
- Damage to emerging regrowth areas for uncontrolled access;
- Accidental damage during construction within the Development Area;

- Rubbish dumping;
- Weed invasion; and
- Dieback infection.

In order to manage uncontrolled access, the management sub-plan in Table 8 will be implemented. This will include clearly delineating Mather Reserve boundary prior to the commencement of any clearing activity for the development to ensure that there is no accidental disturbance of Mather Reserve. The Mary Street Reserve will be fenced prior to the commencement of rehabilitation and management activities. As a minimum the Offset Sites will be delineated by:

- Surveying the boundaries;
- Clearly marking the surveyed boundaries using permanent fencing;
- Development and submission of plans for the subdivision of Lot 9000 Flynn Drive for the creation of Mather Reserve. Mather Reserve (formerly Lot 9000) was subdivided (date) to create two lots – Lot 9100 CoW freehold (site) and Lot 8001 (offset), which are subject to a Management Order, meaning it is owned by the Crown and the land is managed by the City of Wanneroo. The purpose of the lot is Conservation; and
- Development and submission of plans to rezone the Mary Street Reserve into “Parks and Recreation”, “Conservation” or similar. Mary Street Reserve (formerly Lot 212) is subject to a Management Order which means it is owned by the Crown and the land is managed by the City of Wanneroo. The purpose of the lot is Conservation.

**Table 8 - Protection of Offset Sites**

| Delineation of Offset Sites   |  |  |
|---|--|--|
| Key Standards / References  |  |  |
| Local Government Act 1995<br>Land Administration Act 1997<br>Planning and Development Act 2005<br>EPBC Offset Policy                                |  |  |
| Objectives  |  |  |
| Delineate Offset Sites.<br>Create a reserve to protect the Offset Sites from future development<br>Protect the Offset Sites from accidental damage. |  |  |
| 1. Targets/KPIs   |  |  |
| Ref   | Details  |  |
| 1.1   | Fence Offset Sites.  |  |
| 1.2   | Re-zone the Offset Sites and/or implement Conservation Covenants   |  |
| 2. Management Actions   |  |  |
| Ref   | Description  | Timing   |
| 2.1   | Mather Reserve is to be surveyed and fenced prior to the commencement of clearing activities of the Development Area.  | Prior to clearing                                |
| 2.2   | Mather Reserve is to be consolidated into a single block of land. The consolidated block is then to become a dedicated conservation reserve, or a conservation covenant is to be placed on the freehold title. | Within 2 years of the commencement of the action |
| 2.3   | Mary Street Reserve to be fenced prior to rehabilitation and management activities   | Within 2 years of the commencement of the action |
| 2.4   | The Mary Street Reserve is to be rezoned to reflect its use as conservation zone or equivalent   | Within 2 years of the commencement of the action |
| 2.5   | Maintain opening in fence for access by pedestrians and conservation management personnel  | Ongoing  |
| 2.6   | Remove any dumped rubbish prior to erecting fencing  | Prior to fencing                                 |

|  |   |   |                         |
|--|---|---|-------------------------|
| 2.7  | Construct a firebreak around the inside of the fencing as required by Department of Fire and Emergency Service (DFES) | Prior to fence construction   |                         |
| 2.8  | Retain historical tracks within Mather Reserve to divide the area into fire manageable cells as required by DFES      | Ongoing   |                         |
| 3. Monitoring  |   |   |                         |
| Ref  | Description and Location  | Parameter   | Frequency               |
| 3.1  | The fencing around the Offset Sites is to be checked annually for damage.   | Mather Reserve and Mary Street Reserve  | Annually or as reported |
| 3.2  | Ongoing maintenance of the firebreak inside the fencing   | Mather Reserve and Mary Street Reserve  | Ongoing                 |
| Contingency and Corrective Actions   |   |   |                         |
| Incident or Consequence  |   | Corrective Action   |                         |
| Offset Sites have not been rezoned, consolidated or protected within 2 years |   | Report as a non-conformance.  |                         |
|  |   | Provide rationale and justification to DAWE why rezoning, consolidation and/or protection will not occur within the 2 year timeframe. |                         |
| Fencing is damaged or vandalised   |   | Record damage<br>Repair within one month of being reported  |                         |

## 4.2 Weed and Disease Management

### 4.2.1 Description of Factor

The Offset Sites have been subject to edge effects and minor disturbance as a result of uncontrolled access. Whilst weeds, in particular exotic grasses, were present in both sites, no Declared Pests under the BAM Act were recorded (Terratree, 2016; NAC, 2017; ELA, 2012).

Weed mapping conducted within the Offset Sites by Natural Area Consulting Management Services 2017a, 2017b) identified populations of four weed species for targeted management:

- Geraldton Carnation Weed (*Euphorbia terracina*);
- Rose Pelargonium (*Pelargonium capitatum*);
- Perennial Veldt Grass (*Ehrharta calycina*); and
- Blackberry Nightshade (*Solanum nigrum*).

*Phytophthora* dieback is a soil borne pathogen that causes root rot in susceptible species of plants. Many species of plants that comprise Carnaby's Black Cockatoo habitat are susceptible to *Phytophthora* dieback.

Terratree (2017) conducted a survey for Dieback within the Offset Sites and Development Area, identifying no indication of the *Phytophthora* species pathogen. Whilst all samples returned negative results for *Phytophthora*, it is important to exercise hygiene protocols to prevent spread from other areas or other diseases.

### 4.2.2 Potential Impacts

Movement of vehicles within and adjacent to Offset Sites has the potential to introduce and/or spread weeds and diseases such as *Phytophthora* dieback. The impacts of weed/disease invasion and spread may include:

- Loss of biodiversity;
- Increased fire risk and changes to fire regime; and
- Destruction of Carnaby's Black Cockatoo habitat.

### 4.2.3 Management

The objective for the management of weeds (invasive plants) is to:

- Minimise the impacts of weeds on biodiversity;
- Minimise the impact of weeds on fire behaviour and fire regimes; and
- Minimise the spread of priority weeds onto adjacent lands.

Management practices to prevent the spread of *Phytophthora* dieback into uninfected areas include strict hygiene measures such as:

- Cleaning footwear and washing down vehicles and equipment in appropriate locations;
- Use of dieback free construction materials;
- Formalising vehicle access tracks with crushed limestone; and
- Provision of information awareness signs and education.

Weeds and *Phytophthora* dieback will be managed by implementing the Hygiene Management Plan (Table 9). The Plan will incorporate a targeted three year weed control program after which an ongoing weed management program is to be implemented by the City's internal Maintenance Department to control new weed populations.

Table 9 - Hygiene management plan to control weeds and *Phytophthora* dieback

| Weeds and Dieback   |  |   |
|---|--|---|
| Key Standards / References  |  |   |
| <i>Environment Protection and Biodiversity Conservation Act 2012</i> (EPBC Act)<br><i>Environmental Protection Act 1986</i> (EP Act)<br><i>Wildlife Conservation Act 1950</i> (WC Act)<br><i>Biosecurity and Agriculture Management Act 2007</i> (BAM Act) Weeds in Australia (DotE 2012)<br>Environmental Weed Strategy for WA (DEC 1999)<br>Environmental Weed Census and Prioritisation for the Swan NRM Region (Bettink & Keighery 2008). |  |   |
| Objectives  |  |   |
| <p>High level management targets include:</p> <p>To prevent the introduction of new weeds into the Offset Sites.</p> <p>To control, with the aim to eradicate, any Declared Pests and High to Very High priority weeds within the Offset Sites. To prevent the introduction of <i>Phytophthora</i> dieback to the sites or surrounds.</p> <p>Control any <i>Phytophthora</i> dieback infestation within the sites.</p>                        |  |   |
| 1. Targets/KPIs   |  |   |
| Ref   | Details  |   |
| 1.1   | No introduction of new significant weed species into the Offset Sites.   |   |
| 1.2   | Eradicate any Declared Pests and High to Very High priority weeds found within the Offset Sites.   |   |
| 1.3   | No evidence of <i>Phytophthora</i> dieback being introduced to the Offset Sites or immediate surrounds within 5 years of construction within the Development Area. |   |
| 2. Management Actions   |  |   |
| Ref   | Description  | Timing  |
| 2.1   | Conduct baseline surveys of Mather Reserve and Mary Street Reserve to determine the current level of weed and <i>Phytophthora</i> dieback infestation.             | Prior to clearing   |
| 2.2   | Conduct targeted weed control in Mather Reserve and Mary Street Reserve as per findings of baseline surveys.   | Seasonal as per optimal control for each target species for three years |
| 2.3   | Develop an ongoing weed management program to be implemented by the City's internal Maintenance Department to control new weed populations.                        | Following the targeted weed control program                             |



| 2.4   | Conduct follow up weed and <i>Phytophthora</i> dieback infestation surveys. These surveys will be compared with the original survey. | Every 5 years   |   |
|---|--|---|---|
| 2.5   | Conduct herbicide spraying of weeds along the clearing line and the boundary of Mather Reserve prior to weeds setting seed.          | As required by monitoring results   |   |
| 2.6   | Control, with the aim to eradicate, any infestation of Declared Pests and High to Very High priority weeds.                          | As required by monitoring results   |   |
| 2.7   | Formalise vehicle access tracks with crushed limestone   | Following establishment of firebreaks.  |   |
| 3. Monitoring   |  |   |   |
| Ref   | Description and Location   | Parameter   | Frequency   |
| 3.1   | Visual inspection of bushland and rehabilitation areas.  | Weed infestations<br>No Declared Pests<br>No High to Very High priority weeds<br>Overall weed cover estimate of <5% (1 or less on the Braun-Blanquet Scale).  | Annual, timed for optimal growth periods for target species |
| 3.2   | Visual inspection with photographic records of vegetation adjacent to the site boundary.   | Evidence of dieback infection:<br>Localised plant deaths within a distinct area.<br>Edge effects with a clear distinction between healthy and diseased vegetation.<br>Evidence of a dieback front with old deaths next to recently killed plants. | Every 5 years   |
| Contingency and Corrective Actions  |  |   |   |
| Incident or Consequence   |  | Corrective Action   |   |
| New weed or Declared Pest or High to Very High priority weed infestation occurring in conservation or rehabilitation areas. |  | Report and investigate.   |   |
|   |  | Arrange for weed control by a suitably trained contractor.  |   |
|   |  | Conduct inspection to check effectiveness of weed control measures  |   |
| Evidence of potential dieback infection.  |  | Report and investigate  |   |
|   |  | Arrange for inspection from suitably experienced consultant.  |   |
|   |  | Implement corrective actions (i.e. phosphite application) on advice from consultant   |   |

#### 4.2.4 Monitoring

Sites will undergo detailed weed mapping in accordance with DBCA's Standard Operating Procedure Techniques for mapping weed distribution and cover in bushland and wetlands (DEC, 2011).

Weeds will be visually assessed annually in line with the optimal growth period for targeted weed species. This visual monitoring will be used to measure effectiveness of herbicide treatments as well as recovery of the native plant communities and flora and impacts of herbicide treatment.

The monitoring locations will focus on a range of values at the site such as significant habitat for Carnaby's Black Cockatoo, the densest occurrences of the most invasive weeds and include edges/margins of the weed infestation. The monitoring results will be compared to the baseline studies, including any signs of weed control spraying impacting on the health of the weeds or native vegetation.

Maintenance will be required to ensure effective control of weeds at the Offset Sites. To prevent excessive weed growth, the timing of subsequent herbicide applications or measures will be determined by a qualified specialist, based on the results of the visual monitoring conducted during the first three years. Each priority weed species will be selectively targeted using the most appropriate method to control the weed species. Weed species will be prioritised based on:

- Declared Pests under the BAM Act;
- High to Very High priority weeds under the Swan NRM weed prioritisation census (Bettink & Keighery);
- Weeds considered to be environmental weeds; and
- Weeds poisonous to wildlife.

Following the three year weed program the City's internal Maintenance Department will implement an

ongoing weed management program to control new weed populations that establish from wind borne seed.

#### 4.2.5 KPIs

The Offset Sites are to have:

- No Declared Weeds; and
- Overall weed cover estimate of <5% (1 or less on the Braun-Blanquet Scale).

### 4.3 Erosion and Dust Management

#### 4.3.1 Description of Factor

Dust and erosion may become a factor during the life of the project, with the potential for the Mather Reserve to be directly impacted by dust deposition from the adjacent Development Area, particularly during clearing and resource extraction. Dust is the generic term used to describe solid airborne particles generated and dispersed into the air by processes such as handling, extracting and stockpiling raw materials and wind-blown dust.

Erosion is a natural process, but it is accelerated by human activities. Erosion within the site will most likely be caused by wind, rainfall and surface runoff. Wind erosion is likely to be a more significant erosion process than rainfall or surface runoff.

Dust lift will occur when bare areas become exposed and soil is stockpiled without adequate coverage. Bare areas, in the form of access tracks, will occur within the Conservation and Development Areas as well as cleared areas within the adjacent Development Area. Additional erosion and dust management controls have been identified and will be implemented for the adjacent Development Area, to protect the adjacent Mather reserve conservation area from dust and erosion external to this site.

Erosion within the Development Area is likely to be limited to wind erosion on bare areas and stockpiles with some water erosion on stockpiles and man-made slopes as well.

#### 4.3.2 Potential Impacts

Dust may have the following impacts:

- Amenity and nuisance impacts on nearby industrial area / horticultural area;
- Loss of visibility on site;
- Deposition on adjacent agricultural crops;
- Adverse effects on human health; and
- Dust deposition from Development Areas to the adjacent Mather Reserve.

#### 4.3.3 Management

Dust and erosion will be managed and monitored in accordance with the Dust and Erosion management sub-plan (Table 9).

Table 10 - Dust and erosion management sub-plan

| Erosion, Bank Stabilisation and Sedimentation  |
|--|
| Key Standards / References   |
| <i>Environmental Protection Act 1986 (EP Act)</i><br>A guideline for managing the impacts of dust and associated contaminants from land development sites, contaminated sites remediation and other related activities (DEC, 2011)         |
| Objectives   |
| <ul style="list-style-type: none"><li>• Minimise dust from lift during construction and operation</li><li>• All stockpiles are stabilised to prevent erosion and dust lift</li><li>• No adverse impacts on adjacent stakeholders</li></ul> |

| 1. Targets/KPIs                               |   |   |             |
|---|---|---|-------------|
| Ref   | Details   |   |             |
| 1.1   | No visible signs of erosion or dust preposition within or at the boundaries of the site or as a result of the adjacent Development Area.  |   |             |
| 1.2   | Address all complaints regarding dust and erosion.  |   |             |
| 2. Management Actions                         |   |   |             |
| Ref   | Description   | Timing  |             |
| 2.1   | Develop and implement the site specific dust management plan (DMP) for all stages of the Development Area in accordance with State guidelines (DEC 2011) and as outlined in the approved Construction Environmental Management Plan (CEMP). | For provision with tender documentation for the Development Area  |             |
| 2.2   | Upgrade sand tracks to formalised gravel tracks   | Complete, ongoing maintenance   |             |
| 2.3   | Upgrade tracks to include berms to mitigate erosion and ensure that the drainage on the site is not altered   | Complete, ongoing maintenance   |             |
| 3. Monitoring                                 |   |   |             |
| Ref   | Description and Location  | Parameter   | Frequency   |
| 3.1   | Visual monitoring of paths and tracks.  | Signs of erosion, bank slumping or the formation of rills and gullies.  | Fortnightly |
| 3.2   | Implement dust monitoring plan.   | Dust lift off and signs of dust deposition within Mather Reserve  | Fortnightly |
| Contingency and Corrective Actions            |   |   |             |
| Incident or Consequence                       |   | Corrective Action   |             |
| Observation of excessive dust lift on site    |   | Report and investigate as an Incident.  |             |
|   |   | Notify development Area Operations and halt work within proximity of the area until cause of dust is addressed.                             |             |
|   |   | Apply water as an immediate dust suppressant measure  |             |
|   |   | Increase dust mitigation measures (e.g. more water trucks).   |             |
| Complaint received                            |   | Report and investigate as an Incident.  |             |
|   |   | Complaint must be addressed within 24 hours if severe, or within one week for minor complaints.   |             |
|   |   | Review procedures and adjust if required.   |             |
|   |   | Conduct additional toolbox meeting to highlight dust management issues.   |             |
|   |   | Notify the CoW Project Manager if the complaint escalates to a serious concern that cannot be addressed by the Development Area Contractor. |             |
|   |   | If repeat incidents occur, implement boundary particulate monitoring in accordance with current DWER dust management guidelines.            |             |
| Signs of erosion on embankments or stockpiles |   | Report and investigate as an incident.  |             |
|   |   | Remediate erosion and stabilise.  |             |

#### 4.3.4 Monitoring

Sites will undergo regular inspections to ensure that there is no visible dust deposition or erosion within the boundary of the offset sites or as a result of the management of the adjacent Development Areas.

Maintenance will be required to ensure effective ongoing control of erosion and dust at the Offset Sites. Signs of erosion and dust as a result from the Development Areas shall be reported as an environmental incident and reported to the Development Area Contractor, as outlined in the CEMP.

#### 4.3.5 KPIs

The Offset Sites are to have:

- No visible signs of dust deposition erosion within or at the boundaries of the site or as a result of the adjacent Development Area; and
- Address all complaints regarding dust and erosion.

### 4.4 Pest Fauna Management

#### 4.4.1 Description of Factor

Pest Fauna includes non-native species that either have a direct effect on Carnaby's Black Cockatoos or their habitat, but also may impact the general biodiversity of the habitat type. Such species may include cats, foxes and rabbits.

The baseline fauna survey and following fox control activities undertaken by APMS recorded evidence of fox activity within the Offset Sites. Although no rabbit activity was observed in the APMS (2016) surveys, numerous rabbits were spotted in the ATA 2007 Flora, Vegetation and Vertebrate Fauna Assessment

#### 4.4.2 Potential Impacts

The impacts of pest fauna:

- Loss of biodiversity by preventing the regeneration of plants;
- Erosion which affects the success rate of plant establishment and regeneration rates;
- Threat to native smaller marsupial species (bandicoots);
- Threat to Black Cockatoos; and
- Competing with native fauna for food.

#### 4.4.3 Management

The management of pest fauna within the Offset Sites will focus on controlling their numbers. By controlling the numbers of pest species, the City can minimise the impacts to plant and animal species that contribute to the biodiversity within the Offset Sites.

Suitable methods for pest fauna control within the Offset Sites includes trapping, such as rubber-jawed foot-hold traps for foxes; and baiting for rabbits.

Given that some pest fauna are able to produce many offspring and re-populate an area, the Department of Primary Industries and Regional Development (DPIRD) recommends exercising control in areas that have been previously known to have populations occur (DPIRD, 2018b). DPIRD further suggests best control practices as listed below:

- Ongoing control (one of efforts will only yield short term results);
- Integration of relevant control methods, timed to late in Summer; and
- District wide campaigns, minimise potential for re-infestation.

Control methods will vary depending on the location and proximity to urban areas. Control methods suggested by DPIRD include:

- Baiting of foxes and rabbits (1080, Pindone); and
- Trapping and shooting.

Baiting, such as with 1080 or Pindone) can be a cost effective way of managing pest fauna populations, however can pose a risk to native and domesticated animals. Notification will be given to neighbours ahead of baiting, carcasses will be destroyed appropriately to reduce the attraction of other pest species, and bait stations will be used to restrict non-target species from accessing the bait.

Trapping using rubber-jawed foot-hold traps was utilised by APMS during the 2016 fox trapping, and would be a suitable method for repeat control of larger pest fauna such as foxes and feral cats. Pest fauna control will be undertaken by a trained and competent person with appropriate licences.

**Table 11 - Pest Fauna control management plan**

| Rabbits   |   |   |                   |   |
|---|---|---|-------------------|---|
| Key Standards / References  |   |   |                   |   |
| Biosecurity and Agriculture Management Act 2007 (BAM Act)   |   |   |                   |   |
| Objectives and Targets  |   |   |                   |   |
| High level management targets include:<br>To eradicate the pest fauna infestations within the Offset Sites.<br>To prevent the spread of new pest fauna populations within the Offset Sites. |   |   |                   |   |
| 1. KPIs   |   |   |                   |   |
| Ref   | Details   |   |                   |   |
| 1.1   | No pest populations within the Offset Sites.  |   |                   |   |
| 1.2   | No introduction of new populations of pest fauna within the Offset Sites.   |   |                   |   |
| 2. Management Actions   |   |   |                   |   |
| Ref   | Description   | Responsibility  | Timing            |   |
| 2.1   | Conduct baseline surveys of the Offset Sites to determine the current presence of pest fauna. Implement pest fauna control program on the basis of survey report findings and commitments in this plan. | the City, ES  | Prior to clearing |   |
| 3. Monitoring   |   |   |                   |   |
| Ref   | Description and Location  | Parameter   | Responsibility    | Frequency   |
| 3.1   | Visual inspection.  | Pest fauna populations.   | the City, ES      | Every 3 months for the first two years then annually. |
| Contingency and Corrective Actions  |   |   |                   |   |
| Incident or Consequence   |   | Corrective Action   |                   |   |
| New pest fauna population recorded.   |   | Report and investigate.   |                   |   |
|   |   | Arrange for additional control by a suitably trained contractor.          |                   |   |
|   |   | Conduct inspection to check effectiveness of pest fauna control measures. |                   |   |

#### 4.4.4 Monitoring

Visual inspections of the Offset Sites are to be conducted every three months for the first two years then annually. These methods will be appropriate to allow for effective monitoring of the relevant pest species, such as those including night time and daytime periods and will include revision of the baiting programme to allow efficacy of the baiting programme to be recorded.

#### 4.4.5 KPIs

The key performance indicators for pest control will be to control and reduce pest fauna in the Offset Sites.

### 4.5 Carnaby's Black Cockatoo Management

#### 4.5.1 Description of Factor

The establishment and management of the Offset Sites are to offset clearing of Black Cockatoo habitat within the Development Area. The Offset Sites include high value Carnaby's Cockatoo foraging habitat, primarily in the form of *Eucalyptus* and *Banksia* vegetation communities.

Mather Reserve contains potential Black Cockatoo habitat trees (Terratree, 2016). Previous revisions of the CAMP included the requirement to salvage hollows from the Development Area, however a targeted Black Cockatoo habitat assessment conducted in 2018 determined that the

hollows recorded in the Development Area were not suitable for salvage (Terrestrial Ecosystems, 2018 and Ecoscape, 2020). Given that there is a low likelihood for Black Cockatoo breeding activity within the Development Area and Offset Sites, actions pertaining to hollow salvage are not proposed in this revised CAMP.

Targeted Black Cockatoo habitat surveys (Terrestrial Ecosystems, 2018 and Ecoscape, 2020) determined that none of the hollows recorded within Mather Reserve are currently being utilised by Black Cockatoos. The low percentage (4.3%) of suitable breeding trees (4 Class 3 trees out of the 93 trees that satisfied the Commonwealth guidelines) indicates that Mather Reserve does not constitute high value as breeding habitat (Ecoscape, 2020). Under the Commonwealth grading system for the assessment of potential nests for Black Cockatoos (Bamford, 2016) Class 3 trees have a potentially suitable hollow visible but no chew marks present; or potentially suitable hollow present (as suggested by structure of tree, such as large, vertical trunk broken off at a height of >10m).

This low number combined with few confirmed records of Black Cockatoo breeding events on the Swan Coastal Plain (Johnstone et al. 2011; Kabat et al. 2012) would possibly reduce the likelihood of Black Cockatoo breeding occurring within the site. The nearest known Carnaby's Black Cockatoo breeding population occurs near the Yanchep National Park, more than 16 km away, and it is unlikely that Carnaby's Black-Cockatoos would nest within Mather Reserve. It is therefore proposed that the salvaged hollows are not installed within either Mather Street or Mary Street Reserves as it is highly unlikely that these hollows would be utilised by Black cockatoos.

Mary Street Reserve did not record any trees that satisfied the Commonwealth guidelines (i.e. no tree had a sufficient DBH size).

#### 4.5.2 Potential Impacts

There are a number of potential impacts on Carnaby's Black Cockatoo and other native fauna including:

- Loss of habitat or vegetation damage due to illegal access;
- Loss of habitat due to uncontrolled fires;
- Loss of habitat due to *Phytophthora* dieback; and
- Predation or habitat degradation by pest fauna.

#### 4.5.3 Management

Management of Carnaby's Black Cockatoo habitat within the Offset Sites will be in accordance with the Carnaby's Black Cockatoo habitat management sub-plan (Table 11). The main aims of the Carnaby's Black Cockatoo habitat management sub-plan are to:

- Minimise the loss of Carnaby's Black Cockatoo habitat; and
- Identify opportunities to enhance Carnaby's Black Cockatoo habitat through weed control and rehabilitation.

The management of habitat condition is addressed within the Vegetation Condition Management Plan (Table 13).

**Table 12 - Carnaby's Black Cockatoo habitat management plan**

| Carnaby's Black Cockatoo habitat  |
|---|
| Key Standards / References  |
| Environment Protection and Biodiversity Conservation Act 2012 (EPBC Act)<br>Environmental Protection Act 1986 (EP Act)<br>Wildlife Conservation Act 1950 (WC Act)<br>EPBC Referral Guidelines for three threatened black cockatoo species (Australian Government, 2012) |
| Objectives  |
| To minimise the reduction of Carnaby's Black Cockatoo habitat wherever possible   |
| 1. Targets/KPIs   |

| Ref  | Details  |  |                            |
|--|--|--|----------------------------|
| 1.1  | No harm or injury to Carnaby's Black Cockatoo.   |  |                            |
| 1.2  | No unapproved disturbance of Carnaby's Black -Cockatoo habitat.  |  |                            |
| 2. Management Actions                              |  |  |                            |
| Ref  | Description  |  | Timing                     |
| 2.1  | Ensure Conservation Area established prior to the commencement of construction activities in the Development Area. |  | Prior to clearing          |
| 2.2  | Establish monitoring quadrats within Carnaby's Cockatoo habitat at Mather Reserve and Mary Street Reserve.         |  | Prior to clearing          |
| 3. Monitoring                                      |  |  |                            |
| Ref  | Description and location   | Parameter  | Frequency                  |
| 3.1  | Visual inspection of Carnaby's Black Cockatoo habitat.   | No Illegal clearing or damage due to fire, weeds or dieback        | Annually                   |
| 3.2  | Monitor vegetation in permanent quadrats   | Vegetation quality and condition does not decline as per procedure | Every two years            |
| 3.3  | Record evidence of pest fauna  | Visual inspection will be undertaken as detailed in Table 9.       | As per Table 9.            |
| 4. Contingency and Corrective Actions continued    |  |  |                            |
| Incident or Consequence                            |  | Corrective Action  | Frequency                  |
| Injured Fauna reported                             |  | Report and investigate.  | Within 24 hours            |
|  |  | Contact Wildcare for assistance if necessary.                      | As necessary               |
| Unapproved clearing of or damage to fauna habitat. |  | Report and investigate.  | Within 24 hours            |
|  |  | Rehabilitate impacted area in line with advice from DWER / DAWE.   | As directed by DWER / DAWE |

#### 4.5.4 Monitoring

The monitoring of Black Cockatoo habitat within the Offset Sites will include permanent quadrats to be monitored every two years, to ensure the condition of these areas is maintained or enhanced. Monitoring of Black Cockatoo habitat will be undertaken by a suitably qualified botanist.

Eight permanent quadrats have been established at Mather Reserve and Mary Street Reserve measuring 10 m x 10 m (Terratree, 2016). The records of monitoring for each quadrat will include:

- Landscape position and aspect;
- Soil characteristics;
- Time since fire;
- Litter cover;
- Vegetation condition and observed disturbances;
- Vegetation community description;
- Flora species, including height and percentage foliage cover; and
- Other relevant information observed.

Permanent quadrats allow for the empirical measurement of native vegetation cover, weed cover and species diversity. Photos of the quadrats allow a visual comparison of changes in vegetation structure and composition over time which will aid in monitoring condition management success as well as the rate of natural regeneration in remnant areas.

#### 4.5.5 Completion Criteria

The completion criteria for the existing vegetation will be:

- The retention of all native vegetation in condition equal to or better than the baseline condition,



except for:

- that cleared for firebreaks
  - following a fire event at the site
- The retention of species considered to be foraging habitat for Black Cockatoos in condition equal to or better than the baseline condition.

## 4.6 Vegetation Condition Management Plan

### 4.6.1 Description of Factor

The EPBC Conditions require measures for rehabilitation for Completely Degraded and Degraded areas within the Mary Street Reserve, including tracks not required for strategic access such as undertaking management works and control of fire. The previously approved revision of the CAMP (Revision 1) included revegetation actions to meet the requirement of these conditions, as well as additional revegetation measures to be implemented within Mather Reserve.

Vegetation condition mapping Mary Street Reserve conducted by Terratree in 2016 identified that the Mary Street Reserve ranged from Very Good to Degraded condition, with encroaching weed invasion degrading bushland condition along the eastern boundary (Terratree, 2016). The track was formalised by the City in 2017 with limestone, to provide access for ongoing management and to function as a firebreak.

Outside of access tracks, no areas within Mather Reserve have been previously identified as requiring revegetation to maintain or improve bushland health, with the vegetation mapped as being in Very Good to Excellent condition (98%) and largely free of aggressive weed species (Terratree 2016).

Table 13 summarizes the vegetation condition of each of the reserves, as identified in the Terratree (2016) report.

**Table 13 Summary of Vegetation Condition within Mather and Mary Street Reserves (Terratree, 2016) aligned with the Keighery (1994) Vegetation Condition Scale.**

| Vegetation Condition   | Mary Street Reserve | Mather Reserve    |
|------------------------|---------------------|-------------------|
| Very Good to Excellent |                     | 52.69 ha (97.7 %) |
| Very good              | 2.43 ha (60.3 %)    |                   |
| Good                   | 0.52 ha (12.9 %)    |                   |
| Good to Degraded       | 0.76 ha (18.86 %)   |                   |
| Completely Degraded    | 0.32 ha (7.94 %)    | 1.22 ha (2.3 %)   |
| Total Area             | 4.03 ha             | 53.91 ha          |

Direct seeding and planting within Mather Reserve is unlikely to provide any direct increase to the availability of Black Cockatoo foraging habitat. As an alternative measure, management of Mather Reserve will focus on the preservation of vegetation condition, through facilitation of natural vegetation regrowth.

A revegetation program to increase Black Cockatoo foraging habitat at the Mary Street offset site will be developed and implemented using suitable local species (see Table 15). Rehabilitation works will be undertaken by Contractors commissioned by the City and monitored by the City staff and external consultants. Previously disturbed areas that are not currently used for fire management and access tracks will be monitored for natural regrowth via visual assessment of both sites.

### 4.6.2 Management, Monitoring and Contingency Actions

There are a range of methods that can be implemented to maintain and enhance the Black Cockatoo foraging habitat values of native vegetation, including:

- Management of edge effect impacts including weed infestation, rubbish and public access



(addressed in Sections 4.1 and 4.2);

- Collection of seed from species desired at the site for use in direct seeding or to produce tube stock for planting within offset sites or landscaping in the local area, with a focus on the propagation and planting of black cockatoo foraging species;
- Use of cleared vegetation, seed, mulch and salvaged logs from the Development Area for use as habitat landscaping and revegetation; and
- Planting of tube stock or direct seeding in Mary Street to improve the overall percentage vegetation condition based on the Keighery (1994) vegetation condition scale and improve the overall species richness of black cockatoo foraging habitat species, with an increased foraging habitat value in comparison to baseline conditions.

The most recent survey to assess the black cockatoo foraging habitat value within the Mary Street site demonstrated that the site comprised of scattered Banksia woodland of low to moderate foraging habitat value. Therefore, the revegetation program in Mary Street should aim to provide foraging habitat that is of at least moderate foraging habitat value (Ecsoscape, 2020a).

Vegetation Condition and the species richness of black cockatoo foraging species will be enhanced and managed by implementing the Vegetation Condition Management Plan (Table 14).

**Table 14 - Vegetation condition management plan**

| Rehabilitation  |  |                                 |
|---|--|---------------------------------|
| Key Standards / References  |  |                                 |
| <i>Environment Protection and Biodiversity Conservation Act 2012 (EPBC Act)</i><br><i>Environmental Protection Act 1986 (EP Act)</i><br><i>Wildlife Conservation Act 1950 (WC Act)</i><br><i>Biosecurity and Agriculture Management Act 2007 (BAM Act)</i>  |  |                                 |
| Objectives  |  |                                 |
| Rehabilitation will aim:<br>To restore vegetation suitable for Carnaby’s Black Cockatoo in Mather Reserve<br>To enhance the vegetation condition and value of Carnaby’s Black Cockatoo foraging habitat within Mary Street Reserve<br>To enhance the vegetation of the Offset Sites through management of natural vegetation regrowth |  |                                 |
| 1. Targets/KPIs   |  |                                 |
| Ref   | Details  |                                 |
| 1.1   | Species representation (establishment of at least 60% of species seeded in each area)  |                                 |
| 1.2   | Survival of seedlings (60% survival of tube-stock)   |                                 |
| 1.3   | A native vegetation cover of 4 or more on the Braun-Blanquet scale (reflective of surrounding vegetation)  |                                 |
| 1.4   | The overall percentage of vegetation classification (Keighery vegetation condition scale, 1994) equal to or exceeding Good – Very good condition, is increased within the Mary Street reserve  |                                 |
| 1.5   | Seeding and vegetation programs must directly include identified foraging cockatoo habitat species (see Table 14)  |                                 |
| 1.6   | The overall value of the foraging habitat within Mary Street should exceed baseline conditions ie. Higher than low to moderate foraging habitat value, using the scoring system developed by Dr Mike Bamford, (2016) or equivalent comparison. |                                 |
| 2. Management Actions   |  |                                 |
| Ref   | Description  | Timing                          |
| 2.1   | Facilitate regrowth of degraded areas in Mather Reserve and improve overall vegetation quality within Mary Street Reserve through a program of weed and rabbit control and by direct seeding or planting suitable seedlings                    | Following approval of this plan |
| 2.3   | Collect seed from the Development Area prior to clearing and use in Offset Sites or landscaping at other City of Wanneroo locations, focusing on identified foraging cockatoo habitat species (see Table 14)                                   | Prior to commencing clearing    |
| 2.4   | Control, with the aim to eradicate, any infestation of Declared Pests and High to Very High priority weeds in the Offset Sites.  | Annually                        |

|   |   |  |   |
|---|---|--|---|
| 2.5   | Mulch site vegetation from areas to be cleared and include in topsoil mix. This will retain moisture and add rhizome material to the soil, to encourage regeneration of species difficult to grow from seed.  | Prior to clearing  |   |
| 2.6   | Transfer salvaged topsoil, from good or better quality vegetation to be cleared, for use in landscaping and revegetation projects within the City of Wanneroo. Ensure that topsoil is taken from dieback free areas. Transfer soil during early winter rains to control dust and maximise seed germination. | Transfer soil during early rains – May-June  |   |
| 3. Monitoring   |   |  |   |
| Ref   | Description and Location  | Parameter  | Frequency   |
| 3.1   | Monitoring of species diversity and density   | Permanent quadrats and photo points to be monitored in Mather Reserve, Mary Street Reserve and in rehabilitated areas  | Every two years   |
| 3.2   | Visual inspection with photographic records of vegetation adjacent to the site boundary.  | Evidence of dieback infection:<br>Localised plant deaths within a distinct area.<br>Edge effects with a clear distinction between healthy and diseased vegetation.<br>Evidence of a dieback front with old deaths next to recently killed plants.  | 5 years after topsoil transfer  |
| 3.3   | Assessment of species composition, plant density and plant health   | Periodic monitoring of permanent quadrats  | Every two years   |
| 3.4   | Monitoring of overall vegetation classification   | The vegetation condition (and above) is monitored in Mather Reserve and Mary Street Reserves based on the Keighery (1994) vegetation condition scale. The overall percentage of vegetation condition within Mather Street should be maintained whilst the overall percentage of Good – Very Good vegetation (and above) should be improved within Mary Street. | Monitor two years after approval of this plan and every five years thereafter to ensure vegetation condition is maintained or improving |
| 3.5   | Monitoring of overall foraging habitat value  | The overall value of foraging habitat is monitored in Mary Street Reserve, based on the Bamford (2006) habitat value scoring system. The overall value of foraging habitat within Mary Street should exceed a low - moderate habitat value (value assessed in Ecoscape, 2020a).  | Monitor two years after approval of this plan and every five years thereafter to ensure foraging value is improving                     |
| Contingency and Corrective Actions                            |   |  |   |
| Incident or Consequence                                       |   | Corrective Action  |   |
| Low natural regrowth in areas previously degraded or cleared. |   | Report and investigate.  |   |
|   |   | Conduct infill planting using local provenance species   |   |
|   |   | Monitor progress   |   |
| Areas that are bare and greater than 10m <sup>2</sup>         |   | Report and investigate   |   |
|   |   | Reseeded by hand broadcast seed mix or be infill planted with tubestock  |   |
|   |   | Monitor progress   |   |

#### 4.6.3 Species Selected for Rehabilitation

The species utilised in the rehabilitation plan will take into account the provenance and suitability of revegetation species and relative planting densities to reflect native vegetation composition, increase black cockatoo foraging habitat and to improve the overall vegetation condition within Mary Street. An indicative list of suitable species is outlined in Table 15, however exact species will be selected on the advice of a qualified revegetation specialist (Terratree, 2016).

To ensure that the foraging habitat score is improved above baseline levels (monitored in the Ecoscape 2020b report) preferred species should be selected from those species identified in both the Carnaby's Black Cockatoo plant species list, used by DPAW (DEC, 2011) and the Habitat assessment (Ecoscape, 2020b). These relevant black cockatoo foraging habitat species are denoted below in Table 14 with a “◇” symbol.

To ensure that the species' preference for foraging species includes the latest scientific research and available knowledge, it is viable that more recent Black Cockatoo research and surveys should

be considered, in comparison to the completed habitat surveys species lists; as part of future rehabilitation strategies to improve the overall foraging habitat score.

Table 15 - Species list (Terratree, 2016)

| Trees  | Shrubs   | Sedges/climbers  | Groundcover/herb  |
|--|--|--|---|
| <i>Allocasuarina fraseriana</i><br>◇ <i>Eucalyptus marginata</i><br>◇ <i>Eucalyptus tottiana</i><br>◇ <i>Banksia attenuata</i><br>◇ <i>Banksia menziesii</i> | <i>Calectasia narragara</i><br><i>Hibbertia huegelii</i> <i>Hibbertia hypericoides</i><br><i>Hibbertia racemosa</i><br><i>Astroloma pallidum</i><br><i>Brachyloma preissii</i><br><i>Conostephium pendulum</i><br><i>Conostephium preissii</i><br><i>Acacia pulchella</i> var. <i>goadbyi</i><br><i>Bossiaea eriocarpa</i><br><i>Daviesia divaricata</i><br><i>Daviesia nudiflora</i><br><i>Gastrolobium linearifolium</i><br><i>Gompholobium tomentosum</i><br><i>Hovea stricta</i><br><i>Hovea trisperma</i><br><i>Jacksonia floribunda</i><br>◇ <i>Jacksonia furcellata</i><br><i>Jacksonia sericea</i><br><i>Jacksonia sternbergiana</i><br><i>Beaufortia elegans</i><br><i>Calothamnus sanguineus</i> <i>Calytrix flavescens</i><br><i>Calytrix fraseri</i><br><i>Eremaea pauciflora</i> var. <i>pauciflora</i><br><i>Hypocalymma robustum</i><br><i>Kunzea glabrescens</i><br><i>Leptospermum spinescens</i><br><i>Melaleuca parviceps</i><br><i>Billardiera fraseri</i><br><i>Adenanthos cygnorum</i><br>◇ <i>Banksia sessilis</i> var. <i>sessilis</i><br><i>Conospermum brachyphyllum</i><br><i>Conospermum stoechadis</i> subsp. <i>stoechadis</i><br><i>Grevillea leucopteris</i><br>◇ <i>Hakea lissocarpa</i><br>◇ <i>Hakea prostrata</i><br>◇ <i>Hakea ruscifolia</i><br><i>Petrophile linearis</i><br><i>Petrophile macrostachya</i><br><i>Stirlingia latifolia</i><br><i>Philotheca spicata</i><br><i>Pimelea suaveolens</i><br><i>Pimelea sulphurea</i><br>◇ <i>Xanthorrhoea preissii</i><br><i>Macrozamia fraseri</i> | <i>Hardenbergia comptoniana</i><br>◇ <i>Mesomelaena pseudostygia</i><br><i>Tetraria octandra</i><br><i>Dianella revoluta</i><br><i>Patersonia occidentalis</i> | <i>Carpobrotus virescens</i><br><i>Lomandra hermaphrodita</i><br><i>Lomandra micrantha</i> subsp. <i>micrantha</i><br><i>Dasypogon bromeliifolius</i><br><i>Kennedia prostrata</i> <i>Scaevola repens</i> var. <i>angustifolia</i><br><i>Conostylis aculeata</i> subsp. <i>cygnorum</i><br><i>Conostylis aurea</i><br><i>Conostylis setigera</i> subsp. <i>setigera</i><br>◇ <i>Banksia dallanneyi</i> var. <i>dallanneyi</i><br><i>Alexgeorgea nitens</i> <i>Hypolaena exsulca</i> <i>Dampiera linearis</i><br><i>Anigozanthos humilis</i><br><i>Anigozanthos manglesii</i><br><i>Haemodorum laxum</i><br><i>Hybanthus calycinus</i> |

#### 4.6.4 Seed Collection Procedure

Seed to be used for growing tube stock and for direct seeding will be sourced locally wherever possible. Reconnaissance visits will be made to nearby bushland to harvest seed to determine the species diversity and seed quantity that can be sourced in time for orders to be placed with local

seed merchants or nurseries as required. Prior to the clearing of vegetation for the development, seed collectors will be engaged to harvest as much seed as possible in the suitable season for the target species. Under normal circumstances seed representing approximately 10% of that produced will be collected so as not to diminish natural seed supplies. Appropriate storage protocols will be applied to groups to maintain viability especially if storing seed for greater than 12 months. Seed collection will be done by a suitably trained and competent person.

#### **4.6.5 Direct Seeding**

Rehabilitation by direct seeding will be conducted in areas such as redundant tracks or unintentionally cleared areas which are often weed free and do not require any weed treatment so they can be direct seeded at the break of season. Direct seeding will be done by a suitably trained and competent person.

#### **4.6.6 Tube Stock Planting Procedure**

Planting of tube stock will be kept to a minimum and will be used in Completely Degraded areas that cannot be direct seeded. It is anticipated that natural recruitment from adjacent native vegetation will promote the establishment of native species in the Offset Sites. Tube stock planting is an option for areas where natural recruitment is low.

Tubestock should ideally follow two seasons of weed control to minimise competition for water. Plants will be placed to create a natural look. Infill planting with additional species or individuals of existing species may be required in subsequent years to ensure the completion criteria are met.

#### **4.6.7 Rehabilitation Monitoring Procedure**

Areas that are seeded, planted with tubestock or both will be visually assessed every three months in Summer, Autumn Winter and Spring for the first 2 years. Permanent quadrats will be monitored every two years in rehabilitated area. The number of quadrats implemented will be selected based on the size of the Offset Site to be surveyed.

## 5.0 Summary

### 5.1 Management Actions

Table 16 summarises general management actions for Mather Reserve and Mary Street Reserve.

Table 15 - Summary of management strategies

| Issue                   | Objective   | Management Measures  |
|-------------------------|---|--|
| Fencing                 | To manage access into the Offset Sites to limit damage to the vegetation and weed vectors   | Recording locations of damage. All damage to be reported to the Police. If required organise repairs by the fencing contractor.  |
| Rubbish removal         | To monitor and limit the amount of rubbish in the Offset Sites  | Locations of rubbish recorded (including opportunistic sightings during any other monitoring). Remove any additional rubbish on an as needed basis   |
| Soil Management         | To minimise spread of <i>Phytophthora</i> dieback   | No vehicles or shoes that are visibly covered in soil will be permitted onto Mather Reserve and Mary Street Reserve and all tools that come in contact with soil will be washed prior to entering the site. Any water to be applied will be taken from a <i>Phytophthora</i> free or treated source.   |
| Weed Control            | To eradicate Declared Pests and High to Very High priority weeds and decrease weeds in the Offset Sites.  | Control of weeds in all Offset Sites seasonally in accordance with identified optimal control periods, utilising suitably qualified personnel. Follow-up spraying using appropriate product as outlined after visual assessments and weed surveys.   |
| Vegetation              | To maintain and enhance the native vegetation in Mather Reserve   | Retain all native vegetation in the Offset Sites except that on designated firebreaks. Retain all vegetation that is critical to Carnaby's Black Cockatoo.   |
|                         | To manage potential decline in condition of the vegetation within Mather Reserve or the Mary St Site rehabilitating Completely Degraded and Degraded areas (excluding the historical site and walk trails and firebreaks) | Collect seed from the Development Area and surrounding area for use in the seeding program to grow local provenance tubestock. Use high quality, low weed mulched topsoil from the development area to stabilise rehabilitated areas and use on bare areas. Species will be selected from the species list. Undertake infill planting in areas that cannot be direct seeded or require additional plants after the seed has germinated. Planting will be undertaken in a random manner to ensure a natural result. |
| Native Fauna Management | To manage populations of native animals and enhance the habitat values of the Offset Sites  | Leaving fallen wood within the Offset Sites unless it impacts on firebreaks or designated tracks.  |
| Pest Fauna Management   | To manage pest fauna in the Offset Sites so populations do not adversely impact on conservation values  | A pest fauna baiting and trapping program to be implemented as soon as possible and at appropriate intervals for the species over the appropriate time for that species  |
| Fire Management         | To protect the Offset Sites and surrounds from bushfire   | Ensure all firebreaks and tracks as specified in the Fire Management Plan are clear. Maintain access points. Maintain the firebreak around the Offset Sites.   |

## 5.2 Monitoring

Table 17 summarises monitoring actions to be undertaken to monitor the management of the conservation and rehabilitated areas for the enhancement of habitat for Carnaby's Black Cockatoo. Actions which do not have defined durations or completion timeframes are intended to be conducted until completion criteria is met.

Table 16 - Summary of monitoring actions

| Factor              | Type of Monitoring  | Frequency                   | Timing                                     |
|---------------------|---|-----------------------------|--|
| Fencing             | Driving inspection around the perimeter   | Annually                    | After fences have been installed           |
| Rubbish             | Inspection of the Offset Sites  | Annually                    | Ongoing                                    |
| Soil                | Visual assessment of vegetation to look for symptoms of <i>Phytophthora dieback</i>   | 5 yearly                    | Winter                                     |
| Weed Control        | Weed monitoring and mapping   | Initially and at completion | At commencement                            |
|                     | Visual assessment   | Annually                    | For three years after works commence       |
|                     |   | As required                 | Ongoing following three year program       |
| Existing Vegetation | Permanent quadrats in Conservation Area and Mary Street   | Biennial                    | Spring                                     |
| Rehabilitation      | Visual assessment   | Annually                    | As required where rehabilitation conducted |
| Native Fauna        | Monitoring of use of habitat and vegetation condition   | Biennial                    | Summer                                     |
| Pest fauna          | Visual assessment for rabbit activity (burrows, scat, diggings)   | Annually                    | For three years after action commences     |
|                     | Visual assessment for pest fauna and pest fauna activity (fox tracks, cat tracks, evidence of predation on smaller species) | Annually                    | For three years after action commences     |
| Fire Management     | Driving inspection around the perimeter and along designated fire tracks  | Annually                    | From commencement                          |

### 5.3 Performance Criteria/Desired outcomes

Table 18 sets out general performance criteria and desired outcomes for management actions.

Table 17 - Completion criteria

| Factor              | Completion Criteria/Desired Outcomes  |
|---------------------|---|
| Fencing             | <ul style="list-style-type: none"> <li>The fence is complete and maintenance is ongoing</li> </ul>  |
| Rubbish             | <ul style="list-style-type: none"> <li>Initial rubbish removal is complete and maintenance is ongoing</li> <li>There will be no rubbish in the Offset Sites</li> </ul>  |
| Weed Control        | <ul style="list-style-type: none"> <li>No Declared Pests or High to Very High priority weeds within the Offset Sites</li> <li>Overall cover estimate of &lt;5% (1 or less on the Braun-Blanquet Scale) according to weed maps of priority Swan Region environmental weeds as determined by annual monitoring and along monitoring transects.</li> </ul>   |
| Existing Vegetation | <ul style="list-style-type: none"> <li>All existing native vegetation within Mather Reserve and the Mary Street Reserve outside firebreaks retained in condition equal to or better than the baseline condition</li> <li>There is an overall increase in the percentage of native vegetation in Good to Very Good condition within Mary Street Reserve outside firebreaks retained in condition equal to or better than the baseline condition</li> <li>All TEC vegetation within Mather Reserve and Mary Street Reserve retained in condition equal to or better than the baseline condition.</li> </ul> |
| Native Fauna        | <ul style="list-style-type: none"> <li>Carnaby's Black Cockatoo utilise the Offset Sites for foraging</li> </ul>  |
| Pest Fauna          | <ul style="list-style-type: none"> <li>No new evidence of pest fauna at the Offset Sites</li> <li>Decrease the presence of pest fauna at the Offset Sites</li> </ul>  |
| Fire Management     | <ul style="list-style-type: none"> <li>Trafficable firebreaks and internal tracks established</li> </ul>  |

6.0 Schedule of Works (Example)


This project is scheduled for three years with monitoring and any additional works being undertaken for a further two years as per the schedule outlined in Table 18.

Table 18 - Schedule of works


| Management Action                                  | Year 1                               |     |     |     |     |     |     |     |     |     |     |     | Year 2                               |     |     |     |     |     |     |     |     |     |     |     | Year 3                               |     |     |     |     |     |     |     |     |     |     |     |  |
|--|--------------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--------------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--------------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
|  | Jan                                  | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Jan                                  | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Jan                                  | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |  |
| Pest Control                                       |                                      |     |     |     |     |     |     |     |     |     |     |     |                                      |     |     |     |     |     |     |     |     |     |     |     |                                      |     |     |     |     |     |     |     |     |     |     |     |  |
| Seed collection and spread                         |                                      |     |     |     |     |     |     |     |     |     |     |     |                                      |     |     |     |     |     |     |     |     |     |     |     |                                      |     |     |     |     |     |     |     |     |     |     |     |  |
| Revegetation / plantings                           |                                      |     |     |     |     |     |     |     |     |     |     |     |                                      |     |     |     |     |     |     |     |     |     |     |     |                                      |     |     |     |     |     |     |     |     |     |     |     |  |
| Vegetation condition and Rehabilitation monitoring |                                      |     |     |     |     |     |     |     |     |     |     |     |                                      |     |     |     |     |     |     |     |     |     |     |     |                                      |     |     |     |     |     |     |     |     |     |     |     |  |
| Weed Control / Monitoring / Mapping <sup>#</sup>   | As per targeted weed control methods |     |     |     |     |     |     |     |     |     |     |     | As per targeted weed control methods |     |     |     |     |     |     |     |     |     |     |     | As per targeted weed control methods |     |     |     |     |     |     |     |     |     |     |     |  |
| Monitoring for: Rubbish, Fire breaks, Fencing      |                                      |     |     |     |     |     |     |     |     |     |     |     |                                      |     |     |     |     |     |     |     |     |     |     |     |                                      |     |     |     |     |     |     |     |     |     |     |     |  |
| Reporting  |                                      |     |     |     |     |     |     |     |     |     |     |     |                                      |     |     |     |     |     |     |     |     |     |     |     |                                      |     |     |     |     |     |     |     |     |     |     |     |  |

**Management Actions**


**Pest Control**


 Pest Fauna Control


**Site Preparation**


 Weed control / herbicide application


**Rehabilitation**

 Seed collecting


 Place seedling order with nurseries


 Broad scale planting of tubestock


 Infill planting of tubestock

 Reporting

**Monitoring (A – initial assessment/mapping; R – rapid visual assessment; Q = quadrat base assessment)**

 Monitoring for: Rubbish, Fire breaks, Fencing

 Rehabilitation / Vegetation monitoring

 Weed assessment / mapping and monitoring

| Implementation                           |                   |             |
|--|-------------------|-------------|
| Management Action                        | Conservation Area | Mary Street |
| Pest fauna control                       | Y                 | Y           |
| Weed control                             | Y                 | Y           |
| Spreading topsoil                        | If Required       | Y           |
| Spreading mulch                          | If Required       | Y           |
| Seed collection                          | Y                 | Y           |
| Direct seeding                           | If Required       | Y           |
| Order seedlings                          | If Required       | Y           |
| Infill planting                          | If Required       | Y           |
| Weed monitoring                          | Y                 | Y           |
| Rehabilitation monitoring                | If Required       | Y           |
| Vegetation condition monitoring          | Y                 | Y           |
| Monitor for rubbish, firebreaks, fencing | Y                 | Y           |

\*Actual date is 3 months following the commencement of the action in accordance with project conditions; Year 3 site preparation allows for stage approach or infill/repeat works

# weed control will be undertaken in the times best suited to particular target species control methods.



## 7.0 References

AECOM (2014) *Construction Environmental Management Plan*, unpublished report prepared for the City of Wanneroo, Perth.

Animal Pest Management Services (2016a) *Flynn Drive – Lot 9000 Neerabup Fauna Survey*, prepared for the City of Wanneroo, Perth.

Animal Pest Management Services (2016b) *Mary Street Lot 24 Wanneroo Offset Site Fauna Survey*, prepared for the City of Wanneroo, Perth.

Animal Pest Management Services (2018) *Report Mather Reserve (Rabbits)*, prepared for the City of Wanneroo, Perth.

ATA Environmental (2007) *Flora, vegetation and vertebrate fauna assessment Neerabup Industrial Area (NIA)*, Neerabup, unpublished report prepared for City of Wanneroo, LandCorp and various landowners.

Bamford, M. pers. comm. (2016)

Bettink, K and Keighery, G (2008) *Environmental Weed Census and Prioritisation, Swan NRM Region* July 2008, viewed June 2015, [http://www.dpaw.wa.gov.au/images/documents/conservation-management/off-road-conservation/urban-nature/reports/swan\\_environmental\\_weed\\_assessment\\_2008\\_summary.pdf](http://www.dpaw.wa.gov.au/images/documents/conservation-management/off-road-conservation/urban-nature/reports/swan_environmental_weed_assessment_2008_summary.pdf).

Coffey Environmental (2008) *Flora and Fauna Survey of Flynn Drive*, prepared for the City of Wanneroo, Perth.

Conservation and Land Management (1999) *Environmental Weed Strategy for Western Australia*, viewed June 2015, [http://www.dpaw.wa.gov.au/images/documents/plants-animals/plants/weeds/environmental\\_weed\\_strategy\\_wa.pdf](http://www.dpaw.wa.gov.au/images/documents/plants-animals/plants/weeds/environmental_weed_strategy_wa.pdf).

Department of Environment and Conservation (DEC) (2011) *Plants Used by Carnaby's Black Cockatoo List prepared by Christine Groom*. [https://www.dpaw.wa.gov.au/images/documents/plants-animals/threatened-species/carnabys/Plants\\_used\\_by\\_Carnabys\\_black\\_cockatoo\\_20110415.pdf](https://www.dpaw.wa.gov.au/images/documents/plants-animals/threatened-species/carnabys/Plants_used_by_Carnabys_black_cockatoo_20110415.pdf)

Department of the Environment and Energy (DotEE) (2012) *Weeds in Australia*, viewed June 2015, <http://www.environment.gov.au/biodiversity/invasive/weeds/index.html>.

Department of the Environment and Energy (DotEE) (2015) *SPRAT Threatened Species Database: Carnaby's Cockatoos*, viewed June 2015, [http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon\\_id=59523](http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=59523).

Department of Planning (2011) *Metropolitan Region Scheme (MRS) – potential habitat for the Carnaby's Black-Cockatoo which may require further assessment*, produced by Mapping & Geospatial Data Branch on behalf of the Western Australian Planning Commission, Perth.

Department of Primary Industries and Regional Development (DPIRD) (2018a) *Western Australian Organism List (WAOL)*, viewed July 2018, <https://www.agric.wa.gov.au/bam/western-australian-organism-list-waol>

Department of Primary Industries and Regional Development (DPIRD) (2018b) *Fox Control*, viewed July 2018, <https://www.agric.wa.gov.au/chemicals/fox-control?page=0%2C1>.

Department of Primary Industries and Regional Development (DPIRD) (2018c) *Rabbit Control Options*, viewed July 2018, <https://www.agric.wa.gov.au/baits-poisons/rabbit-control-options?page=0%2C0>.

Department of Sustainability, Environment, Water, Population and Communities (DSEWPoC) (2012) *EPBC Act referral guidelines for three threatened black cockatoo species: Carnaby's cockatoo (endangered) *Calyptorhynchus latirostris*, Baudin's cockatoo (vulnerable) *Calyptorhynchus baudinii*, Forest red-tailed black cockatoo (vulnerable) *Calyptorhynchus banksii naso**.

Eco Logical Australia (ELA) (2012) *Ground truthing of environmental values for Lot 4 Flynn Drive Neerabup*, prepared for City of Wanneroo.

Eco Logical Australia (ELA) (2013) *Targeted Flora and Fauna Assessment Lot 4 Flynn Drive Neerabup* Prepared for City of Wanneroo.

Ecoscape (2018a) *Final Flora Survey Mary Street and Mather Reserve*, Report by Ecoscape Spring 2018 for City of Wanneroo

Ecoscape (2018b) *Final Kangaroo Survey Neerabup*, Report by Ecoscape Spring 2018 for City of Wanneroo

Ecoscape (2020a) *Black Cockatoo Habitat Survey Report – Neerabup Industrial Area and Offset Sites*, Report by Ecoscape Spring 2019 for City of Wanneroo

Ecoscape (2020b) *Final Flora Survey Mary Street and Mather Reserve*, Report by Ecoscape Spring 2019 for City of Wanneroo

Government of Western Australia (2000) *Bush Forever Volume 2: Directory of Bush Forever Sites*. Department of Environmental Protection, Perth, Western Australia.

Mitchell, B and Balogh, S (2007) *Monitoring Techniques for Vertebrate Pests: Rabbits*, NSW Department of Primary Industries and Bureau of Rural Sciences, Queensland.

Natural Area Consulting Management Services (2017a) *Weed Mapping Report Lot 9000 Flynn Drive*, prepared for the City of Wanneroo, Perth.

Natural Area Consulting Management Services (2017b) *Weed Mapping Report Lot 24 Mary Street*, prepared for the City of Wanneroo, Perth.

RPS Bowman Bishaw Gorham (2006) *Neerabup Industrial Area: Vegetation and Flora Surveys*, unpublished report prepared for LandCorp.

Terratree (2016) *Level 2 Flora and Vegetation Assessment of Conservation Offset Areas*, prepared for the City of Wanneroo, Perth.

Terratree (2017) *Phytophthora Dieback Assessment of Conservation and Development Areas*, prepared for the City of Wanneroo, Perth.

Terrestrial Ecosystems (2018) *Black Cockatoo Habitat Survey Report - Neerabup Industrial Area and Offset Sites*, prepared for the City of Wanneroo, Perth.