



## CLEARING PERMIT

*Granted under section 51E of the Environmental Protection Act 1986*

### PERMIT DETAILS

Area Permit Number: 8172/1  
File Number: DWERTV1170  
Duration of Permit: 20 June 2019 to 20 June 2031

### PERMIT HOLDER

City of Rockingham

### LAND ON WHICH CLEARING IS TO BE DONE

Lot 4 on Diagram 31062, Baldivis  
Lot 103 on Diagram 50627, Baldivis  
Lot 104 on Diagram 50627, Baldivis  
Lot 105 on Diagram 50627, Baldivis

### AUTHORISED ACTIVITY

The Permit Holder shall not clear more than 1.85 hectares of native vegetation within the area hatched yellow on attached Plan 8172/1a.

### CONDITIONS

#### 1. Period in which clearing is authorised

The Permit Holder shall not clear any native vegetation after 20 June 2021.

#### 2. Avoid, minimise and reduce the impacts and extent of clearing

In determining the amount of native vegetation to be cleared authorised under this Permit, the Permit Holder must have regard to the following principles, set out in order of preference:

- (a) avoid the clearing of native vegetation;
- (b) minimise the amount of native vegetation to be cleared; and
- (c) reduce the impact of clearing on any environmental value.

#### 3. Dieback and weed control

When undertaking any clearing or other activity authorised under this Permit, the Permit Holder must take the following steps to minimise the risk of the introduction and spread of *weeds* and *dieback*:

- (a) clean earth-moving machinery of soil and vegetation prior to entering and leaving the area to be cleared;
- (b) ensure that no dieback or weed-affected soil, mulch, fill or other material is brought into the area to be cleared; and
- (c) restrict the movement of machines and other vehicles to the limits of the areas to be cleared.

#### 4. Fauna management – direction of clearing

The Permit Holder shall conduct clearing in a slow progressive manner towards surrounding remnant vegetation to allow fauna to escape the clearing activity.

#### 5. Fauna management – breeding habitat

Prior to undertaking any clearing or other activity authorised under this Permit, the Permit Holder must install nine artificial black cockatoo nesting hollows within the area hatched red on attached

Plan 8172/1b being Lot 4 on Diagram 31062, Baldivis. The artificial black cockatoo nest hollows of this Permit must:

- (a) be designed and placed in accordance with the guidelines provided in Schedule 1 to this Permit; and
- (b) be monitored and maintained in accordance with the guidelines provided in Schedule 2 to this Permit, for a period of at least 10 years.

#### 6. Revegetation Plan

Within 12 months of the commencement of clearing, the Permit Holder shall implement and adhere to the 'Eco Logical Australia 2019. *Baldivis District Sporting Complex Revegetation Plan*. Prepared for City of Rockingham', including but not limited to the following actions;

- (a) commence *rehabilitating* the area hatched red on Plan 8172/b/1 by;
  - (i) undertaking an extensive pre-planting weed control program;
  - (ii) deliberately *planting* native vegetation that will provide primary foraging species for black cockatoos and enhance the species composition, structure and density of the Tuart/Jarraah woodland; and
  - (iii) ensuring only *local provenance* seeds and propagating material are used to *rehabilitate* the area.
- (b) establishing six 5 x 5 metre quadrat monitoring sites within the *rehabilitated* area;
- (c) fencing the *rehabilitated* area;
- (d) implementing hygiene protocols by cleaning earth-moving machinery of soil and vegetation prior to entering and leaving the site;
- (e) undertaking biannual weed control activities to maintain a minimum 80 per cent weed free state by the end of the project maintenance period;
- (f) achieve the following completion criteria after the five year monitoring period for the area *rehabilitated* under this Permit;

Criterion	Aspect	Completion targets	Completion criteria	Monitoring
1	Species richness	Species richness of 70 per cent of the species that have been planted.	Species richness and number of plants/m <sup>2</sup> in the <i>rehabilitation</i> area is at least 70 per cent of the species that have been planted.	The species and number of plants/m <sup>2</sup> in the <i>rehabilitation</i> area will be counted in years 1, 3 and 5.
2	Per cent cover of weeds.	A target of <=20 per cent of weed cover has been established for the <i>rehabilitation</i> site.	The <i>rehabilitation</i> area has <=20 per cent cover of weeds.	Monitor <i>rehabilitation</i> areas in years 1, 3 and 5.
3	No declared weeds are present.	Declared Weeds are managed in accordance with the <i>Biosecurity and Agriculture Management Regulations 2013</i> .	Declared weeds are absent from the <i>rehabilitation</i> .	Monitor the <i>rehabilitation</i> site for declared weeds by traversing the areas in years 1, 3 and 5.
4	Survival rate to be achieved.	If after planting a survival rate of at least 70 per cent is not achieved, infill seedling planting must occur within 12 months and monitored for a further 5 years.	The <i>rehabilitation</i> area needs to ensure a survival rate of at least 70 per cent of the species planted is achieved after 5 years, and replant any plants within 12 months of dying.	The number of surviving plants in the <i>revegetation</i> areas will be counted in years 1, 3 and 5.

5	Stem Density	A total native species stem density of 1 plant/m <sup>2</sup> .	The <i>rehabilitation</i> area contains a total native species stem density of 1 plant/m <sup>2</sup> .	Stem density to be assessed in years 1, 3 and 5.
6	Tree Density	A total of 540 trees must be planted comprising of 50 per cent Jarrah and 50 per cent Tuart tree species.	The <i>rehabilitation</i> area contains 540 trees comprising of 50 per cent Jarrah and 50 per cent Tuart tree species.	Tree density to be assessed in years 1, 3 and 5.
7	Stem density for black cockatoo foraging species.	A total native species stem density of 30 per cent of the total seedling numbers (0.3 plants/m <sup>2</sup> ) planted will be primary foraging species for black cockatoo species.	The <i>rehabilitation</i> area contains a total native species stem density of at least 30 per cent of the total seedling numbers planted which provide primary foraging habitat for black cockatoo species.	Stem density for black cockatoo foraging species to be assessed in years 1, 3 and 5.
8	Vegetation Condition	<i>Rehabilitate</i> to good condition.	<i>Rehabilitation</i> area is in good condition	Vegetation condition to be assessed in years 1, 3 and 5.

### **PART III - RECORD KEEPING AND REPORTING**

#### **7. Records must be kept**

The Permit Holder must maintain the following records for activities done in pursuant to this Permit:

- (a) In relation to the clearing of native vegetation authorised under this Permit:
- (i) the location where the clearing occurred, recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 1994 (GDA94), expressing the geographical coordinates in Eastings and Northings;
  - (ii) the date that the area was cleared; and
  - (iii) the size of the area cleared (in hectares).
  - (iv) actions taken to avoid, minimise and reduce the impacts and extent of clearing in accordance with condition 2 of the Permit.
  - (v) actions taken to minimise the risk of the introduction and spread of *weeds* and *dieback* in accordance with condition 3 of the Permit; and
  - (vii) actions taken in accordance with condition 4 of this Permit.
- (b) In relation to fauna management pursuant to condition 5 of this Permit:
- (i) the date each artificial black cockatoo nest hollow was installed;
  - (ii) the location of each artificial black cockatoo nest hollow installed, recorded using a GPS unit set to GDA94, expressing the geographical coordinates in Eastings and Northings or decimal degrees;
  - (iii) a photo of each artificial black cockatoo nest hollow installed;
  - (iv) the dates each artificial black cockatoo nest hollow installed was monitored;
  - (v) a description of the monitoring methodology employed for each artificial black cockatoo nest hollow installed;
  - (vi) a description of the monitoring observations for each artificial black cockatoo nest hollow installed;
  - (vii) the date(s) each artificial black cockatoo nest hollow installed was maintained; and
  - (viii) a description of the maintenance activities undertaken for each artificial black cockatoo nest hollow installed.

- (c) In relation to the revegetation of areas pursuant to condition 6 of this Permit:
- (i) a description of the *rehabilitation* activities undertaken;
  - (ii) the size of the area *rehabilitated* (in hectares); and
  - (iii) the date that the area was *rehabilitated*.

## 8. Reporting

- (a) The Permit Holder must provide to the *CEO* on or before 30 June of each year, a written report:
- (i) of records required under condition 7 of this Permit; and
  - (ii) concerning activities done by the Permit Holder under this Permit between 1 January to 31 December of the preceding calendar year.
- (b) If no clearing authorised under this Permit was undertaken between 1 January to 31 December of the preceding calendar, a written report confirming that no clearing under this permit has been carried out, must be provided to the *CEO* on or before 30 June of each year.
- (c) Prior to 20 April 2031, the Permit Holder must provide to the *CEO* a written report of records required under condition 7 of this Permit where these records have not already been provided under condition 8(a) of this Permit.

## DEFINITIONS

The following meanings are given to terms used in this Permit:

**dieback** means the effect of *Phytophthora* species on native vegetation;

**fill** means material used to increase the ground level, or fill a hollow;

**local provenance** means native vegetation seeds and propagating material from natural sources within 100 kilometres and the same Interim Biogeographic Regionalisation for Australia (IBRA) subregion of the area cleared;

**mulch** means the use of organic matter, wood chips or rocks to slow the movement of water across the soil surface and to reduce evaporation;

**planting** means the re-establishment of vegetation by creating favourable soil conditions and planting seedlings of the desired species;

**rehabilitate/ed/ion/ing** means actively managing an area containing native vegetation in order to improve the ecological function of that area;

**weed/s** means any plant -

- (a) that is a declared pest under section 22 of the *Biosecurity and Agriculture Management Act 2007*; or
- (b) published in a Department of Biodiversity, Conservation and Attractions Regional Weed Rankings Summary, regardless of ranking; or
- (c) not indigenous to the area concerned.



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Jane Clarkson  
MANAGER  
NATIVE VEGETATION REGULATION

*Officer delegated under Section 20  
of the Environmental Protection Act 1986*

21 May 2019

**SCHEDULE 1**

**How to design and place artificial hollows for Carnaby's cockatoo**

## Artificial hollows for Carnaby's cockatoo



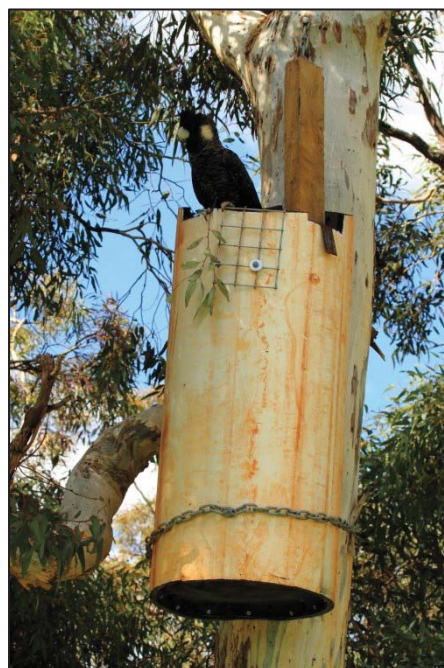
## How to design and place artificial hollows for Carnaby's cockatoo

Artificial hollows can be used to help conserve the threatened Carnaby's cockatoo by enabling the cockatoos to breed in areas where natural hollows are limited.

A wide variety of artificial hollow designs have been used with mixed success. Evidence suggests that, while the hollow must meet some basic requirements, other factors such as proximity to existing breeding areas may be more important in determining the success of artificial hollows. Before using this information sheet to construct or install an artificial hollow, you should refer to the criteria listed in the separate information sheet; *When to use artificial hollows for Carnaby's cockatoo*.

This information sheet contains broad guidelines for the design and placement of artificial hollows for Carnaby's cockatoo.

Below are three examples of successful artificial hollows used by Carnaby's cockatoo for nesting. Artificial hollows made from a natural log with cut side entrance (left), white industrial pipe with top entrance (centre) and natural log with natural side entrance (right).



Photos by Christine Groom (left and right) and Rick Dawson (centre)

## Walls

The walls of the artificial hollow need to be constructed from a material that is;

- Durable enough to withstand exposure to elements for an extended period of time (i.e. 20+ years).
- Able to simulate the thermal properties of a natural tree hollow.
- Not less than 380 mm in internal diameter.
- Preferably 1.2 m deep overall and 1m deep to top of substrate/nesting material.

Successful artificial hollows have been constructed from sections of salvaged natural hollow, black and white industrial pipe. When using non-natural materials care must be taken to ensure there are no toxic residues and that the materials are safe to ingest.

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## Base

The base of the artificial hollow must be;

- Able to support the adult and nestling(s).
- Durable enough to last the life of the nest.
- Free draining.
- At least 380 mm in diameter.
- Covered with 200 mm of sterile, dry, free draining material such as charcoal, hardwood woodchips or wood debris.

### **Do not use:**

- Saw dust or fibre products that will retain moisture.

Example materials that could be used for artificial hollow bases include heavy duty stainless steel, galvanised or treated metal (e.g. Zinalume ®), thick hardwood timber slab or marine ply (not chipboard or MDF). The base material must be cut to size to fit internally with sharp or rough edges ground away or curled inwards and fixed securely to the walls.



Carnaby's cockatoo eggs in an artificial hollow.  
*Photo by Rick Dawson*

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## Entrance

The entrance of the artificial hollow must;

- Have a diameter of at least 270 mm).
- Preferably be top entry which will minimise use by non-target species.

Top entry hollows are unattractive to nest competitors such as feral bees, galahs and corellas. Side entry hollows have been successful in areas where feral bees are not a problem and where galahs and corellas are deterred.

## Ladder

For artificial hollows made of non-natural materials, or of processed boards, it is necessary to provide a ladder to enable the birds to climb in and out of the hollow easily.

The ladder must be;

- Securely mounted to the inside of the hollow.
- Made from an open heavy wire mesh such as WeldMesh™ with mesh size of 30 - 50 mm, or heavy chain.

### Do not use:

- A material that the birds can chew.
- Galvanized because the birds may grip or chew the ladder and ingest harmful compounds.

If using mesh for the ladder, the width will depend on the curvature of the nest walls. A minimum width of about 60 - 100 mm is recommended.

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## Sacrificial chewing posts

For artificial hollows made of non-natural materials, or of processed boards, it is necessary to provide sacrificial chewing posts. The birds chew material to prepare a dry base on which to lay their egg(s).

The sacrificial chewing posts must:

- Be made of untreated hardwood such as jarrah, marri or wandoo
- Be thick enough to satisfy the birds' needs between maintenance visits.
- Extend beyond the top of the hollow as an aid to see whether the nest is being used.
- Be placed on the inside of the hollow.
- Be attached in such a way that they are easy to replace e.g. hook over the top of hollow or can slide in/out of a pair of U bolts fitted to the side of the hollow.

It is recommended that at least two posts are provided. Posts 70 x 50 mm have been used, but require replacing at least every second breeding season when the nest is active. Birds do vary in their chewing habits and therefore the frequency at which the chewing posts require replacement will also vary.



Bottom of an artificial hollow showing ladder that is fixed to the wall and a chewed sacrificial post which is 200 mm from the floor.

*Photo by Rick Dawson*

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## Mountings

The artificial hollows must be mounted such that:

- The fixings used will last the duration of the nest e.g. galvanized bracket or chain fixed with galvanized coach screws.
- It is secured by more than one anchor for security and stability.
- It is positioned vertically or near vertically.



## Placement

Sites should be chosen within current breeding areas and where they can be monitored, but preferably not conspicuous to the general public. It is important that artificial hollows are placed where they will be accessible for future monitoring and maintenance. For more detail refer to the separate information sheet; *When to use artificial hollows for Carnaby's cockatoo*.

The height at which artificial hollows should be placed is variable. The average height of natural hollows in dominant tree species in the area is a good guide. Natural hollows used by Carnaby's cockatoos have been recorded as low as 2 m above the ground. If located on private property the hollows can be placed lower to the ground so they are accessible by ladder or a rope and pulley system can be used. Where public access is possible artificial hollows should be placed at least 7 m high (i.e. higher than most ladders) and on the side of the tree away from public view to reduce the chance of interference or poaching.

Carnaby's cockatoo show no preference for aspect of natural hollows, however, it may still be beneficial to place artificial hollows facing away from prevailing weather and where they receive the most shade and protection.

Artificial hollows to be placed in trees require:

- Accessibility of the tree for a vehicle, elevated work platform or cherry picker.
- A section of trunk 2-3 m long suitable for attaching the hollow

If necessary, artificial hollows may be placed on poles, but this may result in excessive exposure to sun during very hot weather. When erected on poles there should be"

- A hinge at the bottom of the pole that can be secured when the pole is in the upright position.
- Access for a vehicle to assist raising the pole.

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## Safety

Care needs to be taken when placing artificial hollows to ensure safety is considered at all times. Artificial hollows are heavy and require lifting and manoeuvring into position up to 7 m above the ground.

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## Maintenance and monitoring

Once artificial hollows have been placed they require monitoring and maintenance to ensure they continue to be useful for nesting by Carnaby's cockatoo. It is important to monitor artificial hollows to determine use by Carnaby's cockatoo, other native species as well as pest species. By undertaking monitoring the success of the design and placement of artificial hollows can be determined and areas for improvement identified for future placement of artificial hollows.

Monitoring can also assess whether any maintenance is required. Without regular maintenance artificial hollows are unlikely to achieve their objective (that is, they will fail to provide nesting opportunities for threatened cockatoos). Therefore it is important to continue a regime of regular maintenance while the artificial hollow is required. It may be several (to many) decades until a natural replacement hollow is available.

For further advice on monitoring and maintenance of artificial hollows please refer to the separate information sheet; *How to monitor and maintain artificial hollows for Carnaby's cockatoo*.



Carnaby's cockatoo female prospecting an artificial hollow.  
Photo by Rick Dawson



Example fixing for artificial hollow  
Photo by Christine Groom

### **Acknowledgements**

This information sheet is a joint initiative of Birdlife Australia, the Western Australian Museum and the Department of Parks and Wildlife. Many individuals have contributed to its preparation. Special acknowledgement is made for the contributions of Ron Johnstone from the WA Museum, Alan Elliott from the Serpentine-Jarrahdale Land care Centre and Denis Saunders. This updated version was compiled by Rick Dawson Department of Parks and Wildlife).

### **Other information sheets in the series: Artificial hollows for Carnaby's cockatoo**

- *How to design and place artificial hollows for Carnaby's cockatoo*
- *How to monitor and maintain artificial hollows for Carnaby's cockatoo*

Information sheets available on the *Saving Carnaby's cockatoo* webpage:

<http://www.dpaw.wa.gov.au/plants-and-animals/threatened-species-and-communities/threatened-animals/208-saving-carnaby-s-cockatoo>

**SCHEDULE 2**

**How to monitor and maintain artificial hollows for Carnaby's cockatoo**



## How to monitor and maintain artificial hollows for Carnaby's cockatoo

It is important to monitor and maintain artificial hollows after they have been erected. Monitoring ensures that the effectiveness of the artificial hollow can be determined. It also means that problems with pest species or any maintenance requirements can be identified and resolved.

Without regular maintenance, artificial hollows are likely to fail to achieve their objective (that is, they will fail to provide nesting opportunities for threatened cockatoos). Therefore it is important to continue a regime of regular maintenance while the artificial hollow is required. It may be several (to many) decades until a natural replacement hollow is available.

Monitoring should be undertaken in order to detect:

- Use by Carnaby's cockatoo
- Maintenance requirements
- Use by other native species
- Use by pest species (e.g. feral bees, galahs, corellas etc.)



Carnaby's cockatoo female prospecting an artificial hollow.  
*Photo by Rick Dawson*

### **How do I monitor artificial hollows?**

Before undertaking monitoring of artificial hollows for Carnaby's cockatoo it is recommended that you seek advice from BirdLife Australia, the WA Museum or the Department of Parks and Wildlife. It is also important to contact Parks and Wildlife, Wildlife Licensing Section, to determine if a scientific licence is required ([wildlifelicencing@dpaw.wa.gov.au](mailto:wildlifelicencing@dpaw.wa.gov.au)).

Monitoring artificial hollows requires keen observation and naturalist skills. It is often not possible to observe evidence of breeding directly (i.e. nestlings or eggs) and inferences must be made based on observation. There are many techniques available to monitor artificial hollows. A combination of several is likely to achieve the best results.

### **Looking for signs of use**

Cobwebs covering the entrance to the hollow will indicate that the hollow has not been used recently. This would also apply to other light debris that may have fallen to cover the opening partially. Signs of recent use or interest in the hollow include evidence of chewing.

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### **Observing parent behaviour around the hollow**

The behaviour of parent birds around a hollow will indicate an approximate age of young in the nest.

<b>Parent behaviour</b>	<b>Approximate age/stage of young</b>
Prospecting for hollow	Unborn
Male only seen out of hollow	Egg or very young nestling (< 3 - 4 weeks)
Both parents seen entering/exiting the hollow	Nestling(s) have hatched (> 3 - 4 weeks)

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### **Observing feeding flocks**

Flocks of all male birds indicate that the females are incubating eggs. When flocks are mixed it suggests the birds have either not laid yet or that the nestlings have hatched and no longer require brooding (approximately 3 - 4 weeks old).

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### **Tapping**

When females are sitting on eggs they will usually respond to tapping at the base of their tree (or pole) by appearing at the entrance or flying from the hollow opening. This is not a guarantee of breeding activity, but an indication that it is possibly occurring in the hollow.

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### **Observing insect activity around nest**

The faecal matter produced by nestlings in a nest attracts insects, especially flies and ants. The type and number of these insects will help indicate how old any nestlings present may be. Factors such as temperature and humidity will also affect insect activity and so observations of insect activity should only be used as supporting evidence for other indications of age/use. Blowflies around a nest usually indicate that a death has occurred.

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### **Listening for nestlings**

With experience it is possible to determine if one or two nestlings are present and a broad estimate of age based on the type and loudness of noises they make.

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### Looking inside the nest

This can be achieved either with the aid of a telescopic pole and camera or mirror, or with the use of a ladder or other climbing equipment. This method can obtain the most detailed monitoring information for artificial hollows. However it is also the most time consuming and difficult to organise. Special equipment is likely to be needed depending on the height and positioning of artificial hollows. There are also safety issues associated with ladder or rope climbing options to reach nests to undertake observations.

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### How often should I monitor artificial hollows?

The minimum frequency of monitoring and the techniques used will be determined by the aims of the monitoring and the resources available. It is important to limit disturbance to breeding birds and this should be considered when determining the techniques used and frequency.

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### How do I maintain artificial hollows?

Artificial hollows require maintenance to ensure they continue to have the greatest chance of them being used by Carnaby's cockatoos. Periodic maintenance checks should be undertaken at least every two years, preferably annually. These checks should be undertaken prior to the breeding season which is between July and January with breeding occurring later in this period in southern areas. It is important to maintain a regime of regular maintenance as long as the artificial hollow is required. It may take several (to many) decades until a natural replacement hollow is available.

Maintenance checks should assess the following as a minimum:

- Condition of chewing posts (if present)
- Condition of attachment points
- Condition of hollow bases
- Stability of tree or pole used to mount the artificial hollow



Artificial hollow base needing repair.  
Photo by Christine Groom

### Repairing hollows

Any problems identified during maintenance checks should be addressed, and any repairs required done, as soon as possible. If breeding is currently occurring, maintenance may need to be delayed if it is likely to disturb the parents or nestling. Likely maintenance needs include replacement of chewing posts (frequently) or nest bases (occasionally) and repairing of any cracks (infrequently). Maintenance concerns regarding the security of attachment points or the stability of the tree or pole should be addressed as a priority for safety reasons.

For artificial hollows known to be used, spare chewing posts should be taken into the field when undertaking maintenance checks.

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**Monitoring of artificial hollows:**

Monitoring aim	Frequency of visits	Monitoring techniques
<b>To determine possible use by Carnaby's cockatoo</b>	At least once during peak breeding season (i.e. between September and December)	<ul style="list-style-type: none"> <li>• Observing behaviour of adults around hollow</li> <li>• Tapping to see if female will flush from hollow (best undertaken between 10am and 3pm when females most likely to be sitting)</li> <li>• Listening for nestlings</li> <li>• Looking for evidence of chewing</li> <li>• Looking inside nest</li> </ul>
<b>To confirm use by Carnaby's cockatoo</b>	At least two visits during peak breeding season (i.e. between September and December)	<p>To observe at least two of the following:</p> <ul style="list-style-type: none"> <li>• Breeding behaviour of adults around hollow or evidence of chewing</li> <li>• Female flushed from hollow</li> <li>• Noises from nestlings in hollow</li> </ul> <p>Or to observe:</p> <ul style="list-style-type: none"> <li>• Nestlings or eggs in nest</li> </ul>
<b>To determine nesting success by Carnaby's cockatoo</b>	The more visits, the better. Preferably fortnightly visits between July and December. As a minimum, at least 3 visits spread throughout breeding season.	<ul style="list-style-type: none"> <li>• Looking inside nest to observe eggs or nestlings.</li> </ul>
<b>To determine use by any species</b>	As often as possible.	<ul style="list-style-type: none"> <li>• Inspection from ground as a minimum.</li> <li>• Looking inside nest for detailed observations.</li> </ul>
<b>To determine maintenance requirements</b>	At least every two years and preferably annually if hollow fitted with sacrificial chewing posts, can be longer if without.	<ul style="list-style-type: none"> <li>• A basic maintenance check can be undertaken from the ground. A ladder or elevated work platform will be required for a comprehensive check and to replace sacrificial chewing posts</li> </ul>

**Acknowledgements**

This information sheet is a joint initiative of Birdlife Australia, the Western Australian Museum and the Department of Parks and Wildlife. Many individuals have contributed to its preparation. The updated version was compiled by Rick Dawson (Department of Parks and Wildlife) with assistance from Denis Saunders.

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# Plan 8172/1a

115°47'42"

-32°20'42"

-32°20'42"




115°47'42"

-32°21'0"

-32°21'0"

## Legend

 CPS areas approved to clear base layers

 Cadastre

 Road Centrelines

 Local Government Authorities

Image



MGA 94  
Geocentric Datum of Australia 1994



Manager  
Native Vegetation Regulation  
21 May 2019  
Officer delegated under Section 20 of the Environmental Protection Act 1986

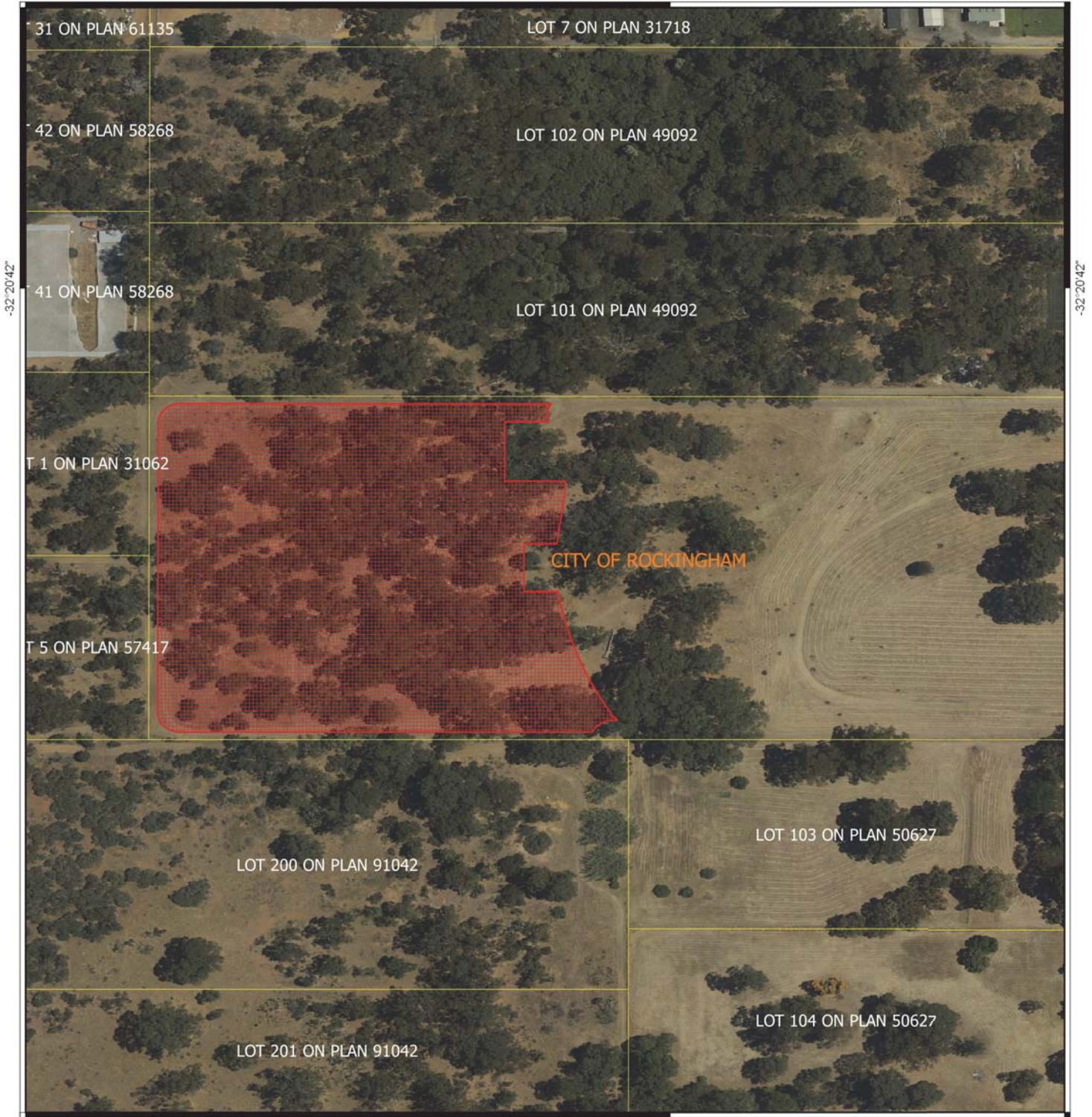


GOVERNMENT OF WESTERN AUSTRALIA






# Plan 8172/1b

115°47'42"

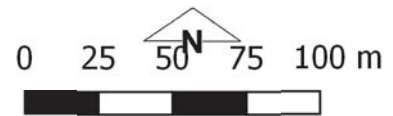


115°47'42"

## Legend

-  CPS subject to conditions base layers
-  Cadastre
-  Local Government Authorities

Image



MGA 94  
Geocentric Datum of Australia 1994



Manager  
Native Vegetation Regulation  
21 May 2019

Officer delegated under Section 20 of the Environmental Protection Act 1986



GOVERNMENT OF  
WESTERN AUSTRALIA



# Clearing Permit Decision Report

## 1. Application details

### 1.1. Permit application details

Permit application No.: 8172/1  
Permit type: Area Permit

### 1.2. Applicant details

Applicant's name: City of Rockingham  
Application received date: 20 August 2018

### 1.3. Property details

Property: Lot 4 on Diagram 31062, Baldivis  
Lots 103, 104 and 105 on Diagram 50627, Baldivis  
Local Government Authority: City of Rockingham  
Localities: Baldivis

### 1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	Purpose category:
1.85		Mechanical Removal	Public Recreation

### 1.5. Decision on application

Decision on Permit Application: Granted  
Decision Date: 21 May 2019  
Reasons for Decision: The clearing permit application has been assessed against the clearing principles, planning instruments and other matters in accordance with section 51O of the *Environmental Protection Act 1986* (EP Act). It has been concluded that the proposed clearing is at variance to principle (b), may be at variance to principles (d), and is not likely to be at variance to the remaining principles.

Based on the assessment, the Delegated Officer determined that:

- the application area contains foraging habitat and suitable nesting habitat for Carnaby's cockatoo (*Calyptorhynchus latirostris*), Baudin's cockatoo (*Calyptorhynchus baudinii*) and the forest red-tailed black cockatoo (*Calyptorhynchus banksii* subsp. *naso*);
- the proposed clearing will impact upon nine nesting trees suitable for black cockatoo species;
- the proposed clearing may result in the spread of weeds and dieback into a federally listed threatened ecological community located adjacent to the application area and adjacent remnant vegetation; and
- the proposed clearing may result in mortality to individual animals during clearing operations.

The Delegated Officer took into consideration the mitigation and avoidance measures discussed in detail under Section 3 of this report to minimise the impact to black cockatoo habitat which include the installation of nine artificial nesting boxes, landscape planting of a minimum of 90 native plants that provide suitable for black cockatoo species, and the revegetation of 3.15 hectares of the Tuart/Jarrah woodland in accordance to an approved Revegetation Plan.

To minimise weed and dieback impacts, a condition has been placed on the permit requiring the implementation of weed and dieback hygiene measures.

To minimise the impact to individual animals during the proposed clearing, a direction clearing fauna condition has been imposed on the permit.

Given the above, the Delegated Officer decided to grant a clearing permit subject to fauna, weed and dieback, and revegetation conditions.

## 2. Site Information

### Clearing Description

The application is to clear 1.85 hectares of native vegetation within the above mentioned land parcels for the purpose of developing the future Baldivis District Sporting Complex for public recreation. The proposed Sporting Complex will include four large playing fields, two club rooms, 18 outdoor hard courts, an indoor recreation centre and outdoor youth space (GHD Pty Ltd, 2018a).

## Vegetation Description

The application area intersects two mapped Swan Coastal Plain vegetation complexes, described as:

- **Herdsmen Complex** : Sedgelands and fringing woodland of *Eucalyptus rudis* (Flooded Gum) - *Melaleuca* species; and
- **Karrakatta Complex-Central And\South** : Predominantly open forest of *Eucalyptus gomphocephala* (Tuart) - *Eucalyptus marginata* (Jarrah) - *Corymbia calophylla* (Marri) and woodland of *Eucalyptus marginata* (Jarrah) - *Banksia* species. *Agonis flexuosa* (Peppermint) is co-dominant south of the Capel River (Heddlie et al., 1980).

The applicant commissioned GHD Pty Ltd to undertake a flora and vegetation survey that identified two vegetation types within the application area, described as:

- **Tuart/Jarrah woodland:** *Eucalyptus gomphocephala* (Tuart), *Eucalyptus marginata* (Jarrah) and *Banksia attenuata* woodland over *Macrozamia riedlei* and *Xanthorrhoea gracilis* isolated shrubs over Iridaceae sp. and *Lupinus* spp. open herbland over *Ehrharta calycina*, *Briza maxima* and *Bromus diandrus* grassland (0.825 hectares); and
- **Parkland cleared:** Scattered individual trees/shrubs (both native and planted) over introduced grasses and herbs (1.025 hectares) (GHD Pty Ltd, 2018).

## Vegetation Condition

The flora and vegetation survey identified the vegetation within the application area as being in a completely degraded (Keighery, 1994) condition, described on the Keighery scale as 'the structure of the vegetation is no longer intact and the area is completely or almost completely without native species'.

## Soil type

One soil type has been mapped by the Department of Primary Industries and Regional Development (DPIRD) across the application area known as the '**Spearwood S4a Phase**' subsystem, which is described as flat to gently undulating sandplain with deep, pale and sometimes bleached, sands with yellow-brown subsoils (Schoknecht et al., 2004).

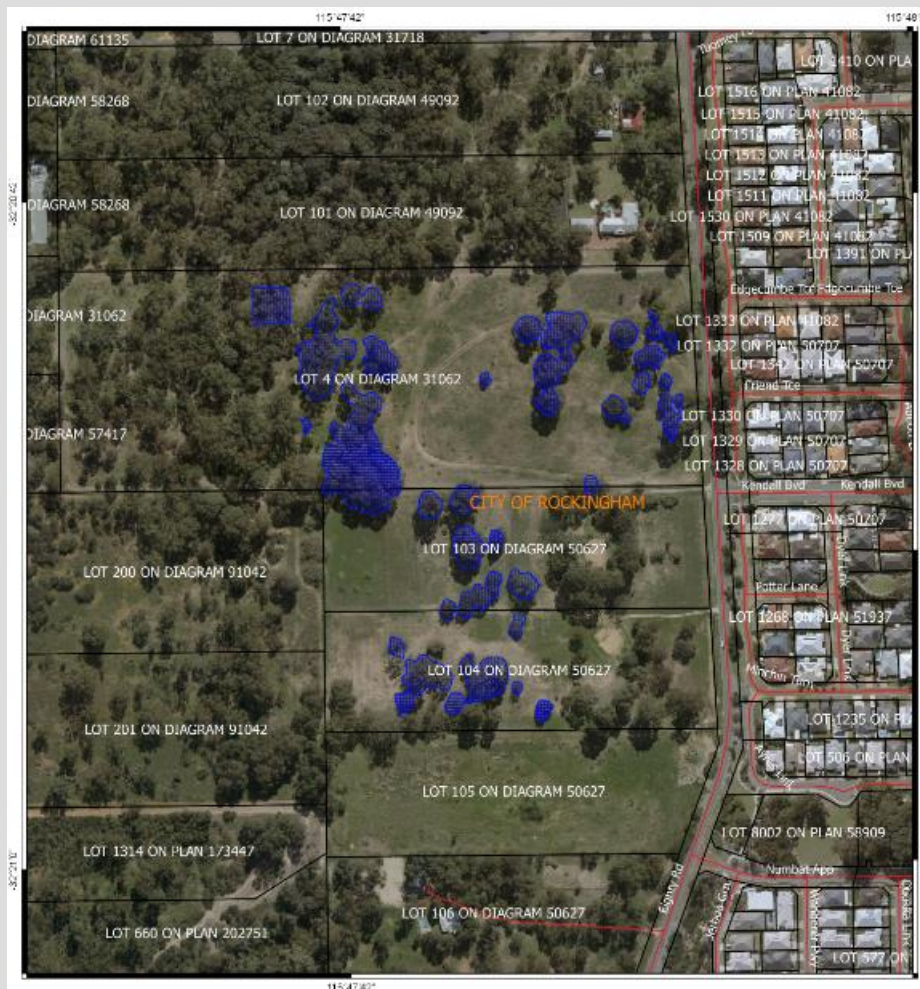


Figure 1: Application Area cross-hatched in blue

### 3. Minimisation and mitigation measures

Prior to the design of the Baldy District Sporting Complex being finalised, the applicant commissioned GHD Pty Ltd to undertake detailed flora, fauna and black cockatoo habitat surveys of the application area to ensure the Sporting Complex was designed in an environmentally sensitive manner and minimise the need for and scale of the proposed clearing of native vegetation (City of Rockingham, 2018a). The applicant provided the following mitigation measures based on the results of these surveys to minimise the environmental impacts associated to the proposed clearing for the proposed future development (City of Rockingham, 2018a):

- Undertake revegetation, weed control and controlled access through the installation of fencing and paths where appropriate within the remnant patch of Tuart/Jarrah woodland located adjacent to the application area in the north west corner of Lot 4;
- Landscape planting in carparks and along site boundaries with a minimum of 90 native plants that are known to provide suitable habitat for black cockatoo species;
- Undertake fauna relocation before the commencement of the proposed works; and
- Install five artificial nesting boxes for black cockatoos in the remnant patch of Tuart woodland located adjacent to the application area in the north west corner of Lot 4.

On 5 December 2018 the applicant was formally notified by the Department of Water and Environmental Regulation (DWER) of the environmental issues associated with the proposed clearing of 1.85 hectares of native vegetation. A preliminary assessment of the application area identified the following environmental impacts:

- The application area contains foraging habitat and suitable nesting habitat for Carnaby's cockatoo (*Calyptorhynchus latirostris*), Baudin's cockatoo (*Calyptorhynchus baudinii*) and the forest red-tailed black cockatoo (*Calyptorhynchus banksii* subsp. *naso*); and
- The proposed clearing will impact upon nine of the 19 hollow nesting trees identified in the fauna survey as being suitable for black cockatoo species.

DWER advised the applicant that further minimisation and mitigation measures are required to be provided in addition to those outlined above as the proposed clearing is considered to result in a significant impact to habitat for black cockatoo species.

On 20 December 2018, the applicant provided additional avoidance and mitigation methods to mitigate the impacts to black cockatoo habitat which included:

- The installation of nine artificial nesting boxes for black cockatoo species (one artificial black cockatoo nesting tube per nesting tree proposed for clearing) within the area of remnant vegetation in the north west corner of Lot 4;
- Monitoring the artificial nesting boxes during peak breeding season for black cockatoo species;
- A written commitment from the City that the remnant patch of Tuart/Jarrah woodland located in the north west corner of Lot 4 will not be cleared or developed within the next 10 year period; and
- Revegetate the 3.15 hectare remnant patch of Tuart/Jarrah woodland with known black cockatoo foraging species and monitor the success of the revegetation against completion criteria in accordance with a Revegetation Plan approved by DWER.

On 9 January 2019, DWER wrote to the applicant requesting that the Revegetation Plan be provided to the Department for review.

The City provided a Revegetation Plan to DWER on 8 March 2019. DWER reviewed the Revegetation Plan provided by the City, and considered the proposed methodology, hygiene and weed control, species list and contingency measures to be acceptable for the proposed rehabilitation site. DWER advised the City that the proposed completion criteria and monitoring in the Revegetation Plan required further clarification and needed to be adjusted in order to satisfy DWER's requirements.

On 18 April 2019, the City provided a revised Revegetation Plan with updated completion criteria and monitoring methods which satisfied DWER's requirements. The commitments of the completion criteria within the Revegetation Plan will mitigate the loss of foraging habitat for black cockatoos through the following actions (Eco Logical Australia, 2019):

- replacing tuart and jarrah trees with 540 new seedlings at a ratio of 3:1 replacement to the trees removed; and
- increasing the potential food sources on site for black-cockatoo species by planting no less than 30 per cent of the total seedling numbers; and
- planting native vegetation that will improve the species composition, structure and density of the Tuart/Jarrah woodland and enhance the foraging and breeding habitat for black cockatoo species.

### 4. Assessment of application against clearing principles

#### (a) Native vegetation should not be cleared if it comprises a high level of biodiversity.

##### **Proposed clearing is not likely to be at variance to this Principle**

The applicant commissioned GHD to undertake a flora and vegetation survey which was undertaken on 11 October 2017 (GHD Pty Ltd, 2018a). The project area surveyed by GHD included the entirety of all subject land parcels under application which totalled 19.39 hectares, and encompassed the application area. Field survey methods involved sampling six non-permanent quadrats of 10 metres by 10 metres in size over the survey area (GHD Pty Ltd, 2018a). The quadrats sampled did not occur within the application area, however, they were located adjacent to the application area and outside of the 'Parkland cleared' vegetation type which is in a completely degraded (Keighery, 1994) condition and consists of an understorey dominated by weeds.

The survey identified that the vegetation within the application area has been highly modified and subject to significant human disturbance through clearing, grazing, fencing, tracks and weed invasion (GHD Pty Ltd, 2018a). The structure of the vegetation within the application area has been significantly altered and as a result is in a completely degraded (Keighery, 1994) condition with an understorey of herbaceous and grassy weeds (GHD Pty Ltd, 2018a). Approximately 55.4 per cent of the application area is classified as 'Parkland cleared' vegetation that is completely void of native understorey species and dominated by grassy weeds.

The local area considered in the assessment of this application is defined as a 10 kilometre radius surrounding the application area. The local area contains approximately 25.79 per cent native vegetation cover.

According to available datasets, there are records of 12 Priority (P) flora species and three rare flora species within the local area. A collective total of 87 native and non-native flora taxa were identified during the flora survey (GHD Pty Ltd, 2018a). This total included 42 native taxa and 45 introduced taxa. There were no conservation significant flora identified during the flora survey (GHD Pty Ltd, 2018a). Noting that the application area is in a completely degraded (Keighery, 1994) condition with invasive grasses that dominate the understorey and that no conservation significant flora were identified during the appropriately timed survey, the application area is unlikely to include or be necessary for the continued existence of conservation significant flora species.

The flora and vegetation survey identified the likely occurrence of the 'Tuart (*Eucalyptus gomphocephala*) woodlands of the Swan Coastal Plain Priority 3 priority ecological community (PEC). The Tuart/Jarraah woodland vegetation type within the application area is considered to be representative of this PEC. As noted under Section 2 'Site information', 0.825 hectares of Tuart/Jarraah woodland occurs within the application area. Noting the completely degraded (Keighery, 1994) condition of this vegetation type within the application area, and in consideration of the majority of this occurrence of the PEC adjacent to the application area is being retained, the proposed clearing is not likely to significantly impact upon this PEC.

The Tuart/Jarraah woodland vegetation type may also be representative of the 'Southern (*Eucalyptus gomphocephala*) and/or *Agonis flexuosa* woodlands' Priority 3 PEC. The flora survey identified a number of key species that are characteristics of this PEC. In consideration of the completely degraded (Keighery, 1994) condition of the vegetation that may be representative of this PEC, the proposed clearing is not likely to significantly impact the conservation status of this PEC.

As discussed under Principle (b), the application area contains significant foraging habitat and breeding habitat for the conservation significant forest red-tailed black-cockatoo (*Calyptorhynchus banksii* subsp. *naso*), Carnaby's cockatoo (*Calyptorhynchus latirostris*) and Baudin's cockatoo (*Calyptorhynchus baudinii*).

As discussed under Principle (d), the application area is located adjacent to a mapped occurrence of the 'Banksia Dominated Woodlands of the Swan Coastal Plain' threatened ecological community (TEC). The proposed clearing is not likely to significantly impact upon this TEC, however, the clearing may result in increased weed invasion spreading into this TEC through increased edge effects. Weed and dieback mitigation measures will assist in mitigating this risk.

While the application area contains suitable habitat for the above mentioned conservation significant fauna, noting that the application area is not likely to contain rare or priority flora, and has been extensively disturbed through human disturbance and weed invasion, it is not likely to contain a high level of biological diversity.

Given the above, the proposed clearing is not likely to be at variance to this Principle.

**(b) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna.**

**Proposed clearing is at variance to this Principle**

The applicant commissioned GHD Pty Ltd to undertake a Level 1 (reconnaissance) fauna survey and targeted black cockatoo habitat assessment which were undertaken on 11 October 2017 and 2 August 2017 respectively (GHD Pty Ltd, 2018b). The project area surveyed by GHD included the entirety of all subject land parcels under application which totalled 19.39 hectares, and encompassed the application area. Two fauna habitat types were identified during the fauna survey which are consistent with the vegetation type described in more detail under section 2 'Site information', namely 'Tuart/Jarraah woodland' and 'Parkland cleared' fauna habitat types (GHD Pty Ltd, 2018b).

A search of the Nature Map database returned records of 54 fauna species of conservation significance within a 10 kilometre radius of the application area, which comprise of 15 threatened fauna species, 27 fauna species protected under international agreement, two specially protected fauna species and 10 priority fauna species (DBCA, 2007-). The majority of these species are waterbird species that utilise the wetlands that occur within the local area. Noting the absence of hydrological features and the terrestrial vegetation that occurs within the application area, suitable habitat is not likely to occur within the area under application for these fauna species.

The fauna survey identified eight conservation significant fauna species that are known or likely to occur within the larger survey area, based on the availability of suitable habitat (GHD Pty Ltd, 2018b). These species include:

- forest red-tailed black cockatoo (*Calyptorhynchus banksii* subsp. *naso*);
- Carnaby's cockatoo (*Calyptorhynchus latirostris*);
- Baudin's cockatoo (*Calyptorhynchus baudinii*);
- Peregrine falcon (*Falco peregrinus*);
- Rainbow bee-eater (*Merops ornatus*);
- South-western brush-tailed phascogale (*Phascogale tapoatafa* subsp. *wambenger*);

- Perth slider, Lined skink (*Lerista lineata*); and
- Black-striped snake (*Neelaps calonotos*).

The fauna survey identified the quality of fauna habitat within the application area as ranging from low quality habitat in the 'Parkland cleared' areas to areas of high quality habitat in the 'Tuart/Jarrah woodland' (GHD Pty Ltd, 2018b). The trees and shrubs within the 'Tuart/Jarrah woodland' comprise of a dense over-storey providing shelter and food resources for native bird species, however provides very low value habitat for ground-dwelling fauna species due to the very open and degraded (Keighery, 1994) condition of the understorey (GHD Pty Ltd, 2018b).

The targeted black cockatoo habitat assessment identified evidence of occurrence within the survey area for two of the seven above mentioned species, namely the forest red-tailed black cockatoo and Carnaby's cockatoo (GHD Pty Ltd, 2018b). Both fauna species are known to occur within the local area where numerous records of the species have been recorded. Forest red-tailed black cockatoos were heard calling in the distance from the survey area and evidence of foraging in the form of chewed jarrah and marri nuts with bite marks typical of the Forest red-tailed black cockatoo were observed within the application area during the survey. Carnaby's cockatoos were also briefly heard nearby to the survey area during the fauna survey (GHD Pty Ltd, 2018b).

Carnaby's cockatoo, Baudin's cockatoo and Forest Red-tailed black cockatoo (collectively referred to as black cockatoos within the report) are classified as rare or likely to become extinct as Endangered fauna under the *Wildlife Conservation Act 1950*. Under the *Environment, Protection and Biodiversity Conservation Act 1999* (EPBC Act), the Carnaby's and Baudin's cockatoo are listed as Endangered and the Forest Red-tailed black cockatoo is listed as Vulnerable. Black cockatoos forage on the seeds, nuts and flowers of a large variety of plants including Proteaceous species (*Banksia*, *Hakea*, *Grevillea*), *Eucalyptus*, *Corymbia* species and a range of introduced species (Valentine and Stock, 2008). Although the remnant of 'Tuart/Jarrah woodland' is in a completely degraded (Keighery, 1994) condition, the dense tree canopy is considered to provide high quality foraging habitat, as well as potential breeding and roosting habitat for black cockatoo species (GHD Pty Ltd, 2018b). The 'Parkland cleared' habitat type, although considered to have low habitat value, provides suitable foraging habitat for black cockatoos (GHD Pty Ltd, 2018b).

The black cockatoo habitat assessment identified that 5.76 hectares of potential foraging habitat for black cockatoo species within the survey area consisting of jarrah, marri, tuart, *Allocasuarina fraseriana*, *Banksia attenuata*, *B. grandis*, *B. menziesii*, *B. sessilis*, *Hakea prostrata* and planted *Pinus* sp. The entire application area (1.85 hectares) was identified as providing suitable foraging habitat for black cockatoos (GHD Pty Ltd, 2018b). The foraging evidence on the jarrah and marri nuts were recorded within the 'Parkland cleared' area of Lots 103 and 104 and is likely to occur within the application area upon review of the *Eucalyptus* trees identified during the survey (GHD Pty Ltd, 2018b).

'Breeding habitat' for black cockatoos is defined as trees of species known to support breeding within the range of the species which either have a suitable nest hollow or are of a suitable DBH to develop a nest hollow. For most tree species, suitable DBH is 500 millimetres (Commonwealth of Australia, 2012). The black cockatoo habitat assessment recorded 177 potential breeding trees within the survey area (five of these were identified as planted trees) comprising of tuart (157), jarrah (8) and marri (12) whereby the DBH was over 500 millimetres, of which 78 trees occur within the application area (GHD Pty Ltd, 2018b; City of Rockingham, 2018a). The survey identified 26 (one of the trees was planted) of the 177 breeding trees contain hollows of various sizes of which 19 have suitable nesting hollows for black cockatoo species (GHD Pty Ltd, 2018b). Nine of the 19 suitable nesting trees occur within the application area (City of Rockingham, 2018b). No breeding activity was recorded within the survey area during the assessment (GHD Pty Ltd, 2018b). Two of the Tuart trees observed during the survey (one tree occurring within the application area) had a large hollow that showed signs of previous use in the form of chew marks (GHD Pty Ltd, 2018b).

The Carnaby's cockatoo recovery plan states, "Success in breeding is dependent on the quality and proximity of feeding habitat within 12 kilometres of nesting sites. Along with the trees that provide nest hollows, the protection, management and increase of this feeding habitat that supports the breeding of Carnaby's cockatoo is a critical requirement for the conservation of the species" (DBCA, 2013). Loss of nesting habitat, together with foraging habitat and water sources within 12 kilometres of nesting sites is one of the key threatening processes contributing towards the decline of Carnaby's cockatoo (Saunders and Ingram, 1998; Parks and Wildlife, 2013). The application area contains suitable foraging habitat and nesting habitat, is located approximately 600 metres from a wetland, is within 500 metres of several Carnaby's cockatoo records and approximately eight kilometres from a confirmed breeding record. Noting this, the application area is considered to contain significant habitat for Carnaby's cockatoo and is also considered to provide significant habitat for Baudin's cockatoo and the forest red-tailed black cockatoo.

The southern brush-tailed phascogale is classified as 'fauna that is of special conservation need as conservation dependent fauna' under the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*. The preferred habitat for this species in Western Australia is within dry sclerophyll forests and open woodlands that contain hollow-bearing trees (DEC, 2012). Noting the historical disturbance of the site and lack of a continuous tree canopy linking nearby remnants which would assist this species in avoiding predators, the application area is unlikely to be significant for this species. However given that the application area contains several hollow bearing trees, it may be occasionally utilised by the southern brush-tailed phascogale, and there is a risk of impacting individuals through the clearing process. It is considered that impacts to individuals can be addressed through a fauna management condition that aims to enable fauna to move on to utilise adjacent areas of suitable habitat.

The habitat type within the application area may provide suitable foraging habitat for the peregrine falcon and the rainbow bee-eater. Although suitable habitat was identified within the application area, it is not likely the proposed clearing will significantly impact on the conservation status of both of these species given both species are highly mobile avian species. The 'Tuart/Jarrah woodland' within the application area is likely to provide suitable habitat for the Perth slider and Black-striped snake. However, noting the very open and completely degraded (Keighery, 1994) condition of the understorey, it is not likely that the application area would provide significant habitat for these species.

The application area is surrounded by areas of remnant vegetation within adjacent residential properties and the western portion of the application area forms part of fauna corridor between remnant vegetation to the north and south of the application area. Noting that only a very small portion of the application area forms part of this linkage, that the majority of the native vegetation that provides this linkage occurs to the west of the application area and the completely degraded condition of the vegetation within the application area, the proposed clearing is not likely to sever or impact upon the environmental values of this linkage.

Given that the application area contains significant habitat for black cockatoo species, the proposed clearing is at variance to this Principle.

Taking into account the applicant's avoidance and minimisation measures (outlined in detail under Section 3 of this report), it is considered that the implementation of these measures will counterbalance impacts to black cockatoos.

**(c) Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora.**

**Proposed clearing is not likely to be at variance to this Principle**

A search of DBCA's rare flora database revealed that there are three records of rare flora species that occur within the local area (10 kilometre radius). The closest rare flora species is mapped approximately 6.1 kilometres east of the application area. This species is a tuberous, perennial herb that has a preference for white or grey sand within low-lying situations adjoining winter-wet swamps (Western Australian Herbarium, 1998-). Noting the habitat requirements of this rare flora species, it is not likely that suitable habitat would occur within the application area.

As described under Principle (a), the application area contains vegetation that has been parkland cleared and has been heavily disturbed by weed invasion and lacks native understorey vegetation (GHD Pty Ltd, 2018a). Given the completely degraded (Keighery, 1994) condition of the understorey and the historical disturbance of the area under application, it is unlikely that significant populations of rare flora recorded within the local area will be present within the application area. No rare flora species were recorded during the flora and vegetation survey which was undertaken at an adequate time and intensity to identify any rare flora species that have been recorded within the local area.

Given the above, the proposed clearing is not likely to be at variance to this Principle.

**(d) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of a threatened ecological community.**

**Proposed clearing may be at variance to this Principle**

According to available datasets, the north western portion of the application area is located immediately adjacent to a mapped occurrence of a 'Banksia Dominated Woodlands of the Swan Coastal Plain' TEC. This TEC is listed as 'endangered' at a federal level under the Commonwealth EPBC Act and 'Priority 3' at a state level.

The Approved Conservation Advice for the TEC states that to be considered representative of the TEC a remnant in the Swan Coastal Plain bioregion must include at least one of four *Banksia* species being candlestick banksia, *Banksia menziesii* (firewood banksia), *Banksia prionotes* (acorn banksia) and/or *Banksia ilicifolia* (holly-leaved banksia); must include an emergent tree layer often including marri, jarrah, or tuart, and other medium trees including *Eucalyptus todtiana* (pricklybark), *Nuytsia floribunda* (WA Christmas tree), western sheoak, *Callitris arenaria* (sandplain cypress), *Callitris pyramidalis* (swamp cypress) or *Xylomelum occidentale* (woody pear); and must include an often highly species-rich understorey (Threatened Species Scientific Committee, 2016).

Although the 'Tuart/Jarrah woodland' vegetation type contains *Banksia* species, it is not considered to be a prominent tree layer canopy, which is a key diagnostic feature of this ecological community. Noting this, the completely degraded (Keighery, 1994) condition of the understorey, and that the other vegetation type within the application area comprises of scattered individual trees described under section 2 as 'Parkland cleared', the application area is not considered to be representative of this TEC.

Noting the mapped TEC is located immediately adjacent to the application area, the disturbance caused by the proposed clearing may degrade the quality of the TEC vegetation through increased weed invasion and human disturbance. Noting the extent of the proposed clearing that will occur adjacent to the TEC, it is expected that impacts to the TEC will be minimal. Weed and dieback management measures will assist in mitigating this risk.

Given the above, the proposed clearing may be at variance to this Principle.

**(e) Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.**

**Proposed clearing is not likely to be at variance to this Principle**

The local area (10 kilometre radius surrounding the application area) retains approximately 25.79% (7,277.14 hectares) native vegetation cover.

The national objectives and targets for biodiversity conservation in Australia has a target to prevent clearance of ecological communities with an extent below 30 per cent of that present pre-1750, below which species loss appears to accelerate exponentially at an ecosystem level (Commonwealth of Australia, 2001).

The Environmental Protection Authority (EPA) recognises the Perth Metropolitan Region to be a constrained area, within which a minimum 10 per cent representation threshold for ecological communities is recommended (EPA, 2008). The application area

is located within the mapped extent of the Perth Metropolitan Region Scheme. Noting that the EPA considers a constrained area to be an area where there is an expectation that development will proceed, and that the cleared area is zoned 'Urban' in the Perth Metropolitan Region Scheme, the 10 per cent threshold applies in this instance.

As indicated in Table 1, the remaining extents of native vegetation within the bioregion and mapped vegetation complexes are above the minimum 10 per cent representation threshold for a constrained area.

The application area contains significant foraging and breeding habitat for black cockatoo species. On this basis, the application area may be significant as a remnant of native vegetation. However, noting the completely degraded (Keighery, 1994) condition of the application area and that the local area and mapped vegetation complexes retain above the recommended threshold, the application area is not likely to be considered significant as a remnant of native vegetation in an area that has been extensively cleared.

Given the above, the proposed clearing is not likely to be at variance to this Principle.

**Table 1: Vegetation extents**

	Pre-European (ha)	Current Extent (ha)	Remaining (%)	Current Extent in all DBCA managed lands (ha)	Extent remaining in all DBCA managed lands (proportion of Pre-European extent) (%)
<b>IBRA Bioregion*</b>					
Swan Coastal Plain	1,501,221.9	578,997.4	38.6	222,766.5	18
<b>Swan Coastal Plain Vegetation complex (Hedde)**</b>					
Herdsmen	9,665.1	3,081	31.9	1060.3	11
Karrakatta Complex-Central And\South	53,081	12,465.2	23.5	4,276.3	8

**(f) Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.**

**Proposed clearing is not likely to be at variance to this Principle**

According to available databases, no watercourses or wetlands are mapped within the application area, however, numerous wetlands are mapped within five kilometres of the application area, with the closest waterbody being 'Fount swamp', a conservation category wetland (CCW) mapped approximately 75 metres north of the application area. The Outridge Swamp (CCW), Lake Walungup (CCW) and an un-named perennial swamp (Resource enhancement category wetland) are located 150 metres south west, 600 metres west and 720 metres north of the application area respectively.

The vegetation types identified in the flora and vegetation survey are terrestrial and are not consistent with riparian vegetation (GHD Pty Ltd, 2018a). The application area is not likely to contain vegetation growing in, or in association with, an environment associated with a watercourse or wetland.

Given the above, the proposed clearing is not likely to be at variance to this Principle.

**(g) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.**

**Proposed clearing is not likely to be at variance to this Principle**

As described under section 2 'Site information', the application area is situated within the mapped soil type **Spearwood S4a Phase** subsystem is described as flat to gently undulating sandplain with deep, pale and sometimes bleached, sands with yellow-brown subsoils (Schoknecht et al., 2004). The soils identified during the flora and vegetation survey that occur within the application area comprised of sandy soils located on a gentle slope (GHD Pty Ltd, 2018a). The sandy soils within the application area are highly susceptible to wind erosion.

Noting the sandy soils within the application area, the proposed clearing may increase the risk of land degradation in the form of wind erosion between clearing and development. However, given the relatively small size of the application area, the proposed end land use, the current lack of an understorey within the application area and the majority of the area under application already being parkland cleared, the risk of appreciable land degradation is likely to be minimal and short term.

The risk of land degradation in the form of water erosion as a result from the proposed clearing is considered to be low, given the highly permeable soils within the application area which typically have high infiltration rates and given the absence of hydrological features within the application area.

Given the above, the proposed clearing is not likely to be at variance to this Principle.



**(h) Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.**

**Proposed clearing is not likely to be at variance to this Principle**

There are several conservation areas mapped within the local area (10 kilometre radius). The closest of these conservation areas is Bush Forever Site No. 356 'Lake Cooloongup, Lake Walyungup and Adjacent Bushland, Hillman to Port Kennedy' located 600 metres west of the application area. Noting the application area is separated from the Bush Forever site by residential development and roads, it is not likely the proposed clearing will impact upon the environmental values of this conservation area.

The application area is surrounded by areas of remnant vegetation within adjacent residential properties and the western portion of the application area forms part of a fragmented ecological linkage between remnant vegetation to the north and south of the application area. It is not likely the proposed clearing will sever this connection as the majority of the native vegetation that provides this linkage occurs to the west of the application area. In consideration of this and noting the completely degraded and parkland cleared nature of the vegetation within the application area, it is not likely the proposed clearing will impact on the environmental values of nearby conservation areas.

Given the above, the proposed clearing is not likely to be at variance to this Principle.

**(i) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.**

**Proposed clearing is not likely to be at variance to this Principle**

As discussed under Principle (f) and Principle (g), the application area does not contain any wetlands or watercourses and the soils within the application area are sandy.

Given the absence of watercourses and wetlands within the application area, the presence of sandy soils, the parkland cleared nature of most of the application area and completely degraded (Keighery, 1994) condition of the vegetation under application, the proposed clearing is not likely to result in the deterioration of surface water quality.

Salinity levels within the application area are mapped at between 500 and 1000 milligrams per litre total dissolved solids. Noting the extent of the proposed clearing and the mapped low salinity levels, the proposed clearing is not likely to contribute to an increase in groundwater salinity or impact on groundwater quality.

Given the above, the proposed clearing is not likely to be at variance to this Principle.

**(j) Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.**

**Proposed clearing is not likely to be at variance to this Principle**

Noting the absence of watercourses and wetlands, the well-drained sandy soils within the application area and the mapped low level flood risk associated with the soil type under application, the proposed clearing is not likely to cause, or exacerbate, the incidence or intensity of flooding.

Given the above, the proposed clearing is not likely to be at variance to this Principle.

**Planning instruments and other relevant matters.**

The Department of Planning, Lands and Heritage (DPLH) reviewed the proposal and advised that the proposed development occurs on land zoned as 'Rural' under the Metropolitan Region Scheme (MRS) and the City's Town Planning Scheme (City of Rockingham, 2018a). DPLH advised that the proposed works are deemed to be public works under the *Public Works Act 1902*, and therefore planning approval under the MRS is not required (City of Rockingham, 2018a). DPLH are satisfied that the 'proposal has regard to the purpose and intent of the use of the zone and is consistent with orderly and proper planning and preservation of amenity' and therefore complies with section 6 (2) and (3) of the *Public Works Act 1902* (City of Rockingham, 2018a).

DWER's Kwinana – Peel land use planning section advised that the application area is located within the Stakehill Groundwater Area and the Stakehill Confined Groundwater subarea which is a proclaimed groundwater area under the *Rights in Water and Irrigation Act 1914* (RIWI Act). On 1 October 2018, the applicant was granted a 'Licence to take water' (GWL201976(1)) under section 5c of the RIWI Act for 98,250 kilolitres authorising the irrigation of up to 3.5 hectares of public open space and 8 hectares of ovals and playing fields (City of Rockingham, 2018b).

A proposal has been referred to the Department of the Environment and Energy (DoEE) (EPBC Act Referral (2018/8323)) to determine whether the proposed action requires approval under the EPBC Act. It is noted that the size of the application area (1.85 hectares) for the clearing permit application differs to the size of the proposed clearing in the EPBC referral application area (2.48 hectares) as the Commonwealth referral includes planted vegetation which is considered to be potential black cockatoo habitat (City of Rockingham, 2018c). On 8 January 2019, a decision was made by the DoEE under Section 75 of the EPBC Act that the proposed clearing is not a controlled action (DoEE, 2019).

No Aboriginal sites of significance have been mapped within the application area.

The clearing permit application was advertised on the DWER website on 01 September 2018 with a 21 day submission period. Two public submissions have been received from the public regarding the application. The main issues raised were:

1. The large amount of trees that provides a visual screen and noise barrier between the proposed development and adjoining residential properties will be impacted by the proposed clearing;
2. The aesthetic values provided by the native vegetation will be impacted by the proposed clearing;
3. The land was never initially zoned for this type of development;
4. Lack of public consultation in regards to the proposed development by the applicant; and
5. The trees proposed for clearing provide habitat to Carnaby's cockatoo, Baudin's cockatoo and Forest Red-tailed black cockatoo and they are regularly seen and heard in the application area daily by local residents.

The concerns raised in points 1 and 2 regarding the aesthetic values that will be impacted as a result of the proposed clearing are beyond the scope of this assessment of clearing impacts and have not been addressed.

In relation to point 3, the proposed works are deemed to be public works under the *Public Works Act 1902* and therefore do not require planning approval under the MRS.

In regard to point 4, it is the applicant's responsibility to ensure public consultation is undertaken as part of the development process.

The concern raised under point 5 that the trees proposed for clearing provide habitat for black cockatoo species has been assessed under Principle (b).

The Department was notified of a submission to the Minister for Environment outside of the advertising period that raised concern as to the impact of the proposed clearing for the proposed development to habitat for black cockatoo species. Further clarification was sought on the impacts as a result of the proposed clearing to black cockatoo habitat and whether the project had been referred to the DoEE for assessment under the EPBC Act to determine if the proposed clearing was deemed to be a controlled action. As discussed above, the impacts to black cockatoo habitat have been assessed under Principle (b) and the project was referred to the DoEE for assessment which considered proposed clearing impacts to black cockatoo habitat not to be a controlled action.

## 5. References

- City of Rockingham (2018a) Clearing Permit Application Supporting Document. Proposed Baldvis District Sporting Complex. City of Rockingham (DWER Ref: A1712536).
- City of Rockingham (2018b) Additional mitigation and avoidance measures, 'Licence to take water' and location of artificial nesting box locations provided by the applicant for clearing permit application CPS 8172/1. City of Rockingham (DWER Ref: A1751189).
- City of Rockingham (2018c) Additional information provided by the applicant for clearing permit application CPS 8172/1. City of Rockingham (DWER Ref: A1740643).
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- Commonwealth of Australia (2012) EPBC Act referral guidelines for three threatened black cockatoo species, Canberra.
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- Department of the Environment and Energy (2019) Referral Decision. Baldvis District Sporting Complex, Baldvis (EPBC 2018/8323). Canberra, Australian Capital Territory (DWER Ref: A1785087).
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- Keighery, B.J. (1994) Bushland Plant Survey: A Guide to Plant Community Survey for the Community. Wildflower Society of WA (Inc). Nedlands, Western Australia.
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GIS Databases:

- Aboriginal Sites of Significance
- Department of Biodiversity, Conservation and Attractions, Tenure
- Conservation managed reserves
- Hydrography, COG Hydro
- Hydrography, General Hydro
- Hydrography, Wetlands
- Land degradation risk categories
- SAC bio-datasets (Accessed May 2019)