



VEGETATION AND BLACK COCKATOO ASSESSMENT

**LOT 123, MORTIMER RD.
CASUARINA**

Integrating Resource Management

Vegetation and Black cockatoo Assessment

Lot 123, Mortimer Rd. Casuarina. WA

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1. Introduction

1.1 Purpose of this Report

The owners of Lot 123 Mortimer Road, are seeking to develop their land into an urban estate. In order to achieve these development aspirations, and to conform to regulatory requirements for the development of land, Mr I. Yujnovich commissioned Bioscience Pty Ltd to conduct a Terrestrial Flora and Vegetation Survey. The report is to be part of the development's Environmental Impact Assessment Report.

There are two distinct purposes for this report. The first is to undertake work to meet the general requirements of EPA Guidance 51 to enable regulatory authorities to gauge the conservation value of the area. The second purpose is to assist with development of the land by identifying flora and vegetation complexes present and the vegetation condition.

1.2 Survey Area

Lot 123 Mortimer Road, Casuarina (32.235° S, 115.853° E) is 45ha of largely *Banksia-Eucalyptus* woodland situated approximately 35km south of Perth, and approximately 4.5 Km east of the Kwinana Town centre (Figure 1). It lies within the City of Kwinana and is surrounded by a mix of semi-rural and urban properties on its western, northern and eastern boundaries with Mortimer Road defining the southern boundary (Figure 2). An initial survey was carried out in 2008 but suspended. On a request by the owner a further modified survey and Black Cockatoo survey were carried out in 2015.

1.3 Site History and Previous Land Use

The property is privately owned by Mr I. Yujnovich and has remained largely undisturbed; consequently, it remains vegetated. The block has not been considered for protection under Bush Forever. In 2002 part of the northern section of the property was classified as a Conservation Category Wetland (CCW) under the Department of Environment's Wetland Classification guidelines.

1.4 Geomorphology and Geology and Hydrogeology

The site is located on Perth Coastal Plain within the Bassendean dune system, which is an area characterised by low dunes of siliceous sands, interspersed with poorly drained areas or wetlands. Soils tend to be a deep bleached grey colour sometimes with a pale yellow B-horizon or a weak iron-organic hardpan at depths generally greater than 2m. Generally, the area has a low relief with minor variations in topography.

The site itself has several dune formations which tend to be 24 to 30m AHD, with the exception of one dune on the south eastern corner of the property that has a height of

38m AHD (Figure 3). In addition, a wetland exists on the northern proportion of the property that is 16m AHD in height. Soil investigations occurred during the installation of five monitoring bores (MMB1 – MMB5) for wetland investigation and further installation of seven monitoring bores (MMB6 – MMB12) for site groundwater assessment (Figure 4).

Investigations revealed soils across the site were uniformly medium to coarse grading Bassendean sand. The surface soil at hole number 4 had a fairly extensive root mat, but otherwise organic content was fine humus.

Soil colour, as with topsoil depth was gradational from grey/white sand to the north through to yellow sand under sand hills to the south to the east. Minor ferruginous, weakly indurated layers were found at 1 m below the surface at MMB1 and MMB2. The groundwater level was found at 1.72 m below the surface at 16 m AHD in the northern wetland area, and over 20 m below the surface at 14.5 m AHD in the southern sandhills. The extensive monitoring shows that groundwater flow, inferred from the hydraulic gradient is from north to south.

The groundwater level was 1.72 meters from the surface at the closest. Whilst it is acknowledged that groundwater levels tend to reach a maximum in September/October (Davidson *op sit*), it must be noted that the winter of 2005 has been the wettest thus far for over 65 years, and variation between the minimum and maximum is typically 1 m. AAMGL was determined from six years of monitoring, and maximum groundwater inferred by reference to long term DoW monitoring bores. Which show a general decline of about 0.4 m in the last 25 years. Table 1 presents DoW long term bore T200(O) (Site ID: 61410107), which is the closest DoW bore being located approximately 1.2km north east of the site, as well as onsite monitoring data. T200(O) was selected to compare the site with due to its location having similar conditions to that of the site.

1.5 Climate

The climate is Mediterranean, with mild wet winters and hot dry summers. The nearest Bureau of Meteorology weather stations is Medina which is 5km west of the site, where the annual rainfall is 754.8 mm per annum (43 year dataset, 1972 to 2015). Evaporation is approximately 1,800 mm per year. As with the rest of the Perth region, the majority of rain falls between May and August, with November to March being very dry (Table 2).

2. Botanic Background

The South West of Western Australia possesses a flora which is so unique and diverse it is considered one of the planets' 34 biodiversity hotspots. The south-west of Western Australia is one of the richest but most threatened reservoirs of plant and animal life on earth. It is one of the most biologically diverse areas on Earth. It contains approximately 13,000 species of plants, of which 3,000 are yet to be formally named, and has a high level of endemism. There are over 700 Genera of plants, with more being discovered each year. The major Families present are Myrtaceae (over 807 species) Proteaceae (681 species) Papilionaceae (424 species) and Mimosaceae (398 species) (FloraBase).

It also has the highest concentration of rare and endangered species in Australia (Hopper and Gioia 2004) For these reasons, the South West of Australia Floristic Region (SWAFR) is valued socially, culturally, economically and ecologically, making it increasingly important to protect for future generations. The SWAFR has been listed by Conservation International as one of 34 Global Biodiversity Hotspots, by WWF as one of the Global 200 Ecoregions, and by BirdLife International as an Endemic Bird Area. Furthermore, it is one of only five globally significant Mediterranean-climate regions in the world and is considered a global Centre of Plant Diversity (WWF/IUCN) (WWF, 2010).

2.1 Swan Coastal Plain Flora

Within the South West Province, the Swan Coastal Plain is a sedimentary, generally low lying formation which extends for about 300 Km in a north south direction between the Darling Scarp and the Indian Ocean. The eastern side of the plain has soils composed of mostly alluvial clays washed from the escarpment, whereas the western side is predominantly aeolian and marine sands which have formed into dunes near coastal (Quindalup), middle (Spearwood) or further interior (Bassendean) areas. The variation of soil types has given rise to a range of habitats for the flora which has developed.

The site had been mapped as being Bassendean Sands. Bassendean sands are poorly sorted, white salicaceous sand in generally low dunes and according to (G, A et al. 1998)“support Jarrah *Eucalyptus marginata*, Prickly bark *Eucalyptus todtiana* Firewood *Banksia menziesii*, *Banksia attenuata*, and the sheoak *Allocasuarina fraseriana* and a diverse heath understory. Low-lying, permanently wet swamps and winter wet depressions, as well as stream banks, support low closed or open forests of Flooded gum *Eucalyptus rudis*, Moonah *Melaleuca*.”

2.2 Floristic Community Types and Vegetation Complexes

The work of (Gibson 1994) adopts an approach to vegetation complexes which recognises that flora species occur in groups depending on environmental factors. By sampling 509 plots on publicly owned land containing different vegetation types in generally very good condition, this study divided the Swan Coastal Plain into four major groups based on the predominating geomorphological elements present. The four groups are the eastern edge of the Swan Coastal Plain (The Pinjarra Plain and Ridge Hill Shelf), the seasonal wetlands (which include a range of soil types and geomorphologies), the Bassendean Dunes, and the Spearwood and Quindalup Dunes mostly adjacent to the coast. Within these four groups, thirty major floristic community types were described, with some further refined by subdivision to give 43 total groups.

The approach of Gibson *et al* has some shortcomings in that it only considers the presence or absence of species in a vegetation unit, rather than their relative abundance. As such the method requires a complete list of all species at a site, irrespective of abundance or dominance. Given the seasonal nature of some ephemeral species, the approach requires detailed work over a number of seasons. However, it is very useful in assessing the conservation value of a particular site for the flora it contains by enabling comparisons to other areas and thereby determining how well represented such community types are in the conservation estate.

Vegetation complexes can be considered as broad ecosystems that contain a range of habitats depending on relief, aspect and local geomorphology. Previous mapping places the property in the Bassendean Vegetation Complex, South. According to (Gibson 1994) the Swan Coastal Plane has 30 defined floristic communities, of which only four are located within the Bassendean dune system. These four groups (i.e. 20 to 23) can be subdivided into nine different subgroups (i.e. 20a, 20b, 21a, 21b, 21c, 22, 23a, and 23b).

2.3 Previous Casuarina Studies

A site immediately north east of Lot 123 Mortimer Road has been preserved under Bush Forever (Site 273: Casuarina Prison Bushland). It has been described as possessing 3 floristic communities types as per Gibson *et al* 1994, firstly the *Melaleuca preissiana* damplands (type 4), secondly the Central *Banksia attenuata* – *Eucalyptus marginate* woodlands (type 21a), and finally the Central *Banksia attenuata* – *Banksia menziesii* woodland (type 23a). Site 273 was considered to be in excellent to pristine condition, and contained 104 native taxa four of which are significant (*Lysinema elegans*, *Burchardia bairdiae*, *Drosera gigantea* subsp. *Geniculata* and *Hensmania turbinata*).

3. Methodology and Limitations of the 2008 Survey

3.1 Methods

3.1.1 Vegetation Survey

Representative site locations were determined firstly by examination of aerial photographs, then by driving around the property, and finally by traverses on foot through each area of interest. Two different approaches were taken to undertake the survey.

Once the general locations of the different floristic communities were ascertained, quadrats of 10 x 10 m were selected and marked out by stakes in at least two separate areas for each major community type present. A complete inventory of flora species was recorded on the 5th of November 2008, three times between early spring and mid-summer in each quadrat. Size and percentage cover of each species were also recorded. Further brief visits were undertaken in late summer.

Transects involved two observers walking a parallel path about 40 m apart for about 100 m into the remnant bushland, then turning 90 degrees and walking apart for about 50 m, then turning another 90 degrees to complete another 100 m parallel to the original direction and returning to the origin. At each 20 m of the walk, each observer took brief notes of the vegetation structure and condition. Salient and/or indicative samples were collected by each observer. Observers compared notes at the completion of each transect. Further transects were walked for the purposes of determining vegetation condition, typically in smaller and more degraded areas.

3.1.2 2008 Flora Survey

Specimens were collected from quadrats and transect to represent all species present (except for trees and larger species well known to the authors). Samples were split into two, with fresh sample stems placed in fresh water for subsequent photography and identification on the same or the next day. The remainder of the sample was pressed and dried for preservation and vouchering in the WA Herbarium.

Identification relied on the use of taxonomic keys, principally in (W.E and J 1978, G, A et al. 1998, A, S et al. 1999) and then by further reference and nomenclature updated using the WA Herbarium FloraBase.

3.2 Limitations of the Flora Survey

The survey was restricted to the flowering plants in the survey areas, even though a number of fungi, mosses and lichens were observed (particularly in wetter areas).

Although a significant time was spent in the field, recording flora, the probability is that

some species of very restricted distribution or very small population size may have been missed. A number of native species only germinate and become abundant after fire, whereas no substantial fires had been experienced in the remnant vegetation for at least the last four years, thus such species may be present but were not recorded.

3.3 Limitations of the floristic community survey

Die-back caused by *Phytophthora cinnamomi* is prevalent in many areas throughout the site, particularly in Banksia and Jarrah woodlands. Because this fungus has a wide and diffuse host range amongst the flora of the Swan Coastal Plain, it may represent another selective pressure changing species presence, and thus obscuring the original community type present prior to development.

3.4 Details of Quadrats

Each quadrat was marked with permanent stakes at each corner and the precise location recorded by GPS and marked on the map (Figure 5).

3.5 Details of Transects

One 100m transect was conducted in 2008, which was logged by GPS and is marked on the map on Figure 5.

4. Conservation Value

Despite extensive clearing for building, semi-rural and horticultural activities, large areas of Bush Protected native vegetation exist within 5km of the property remains (Figure 5), however they tend to be fragmented. The conservation value of flora and vegetation in any area can be assessed according to parameters including:

- The rarity of vegetation within the area.
- The diversity of vegetation communities and floristic types present.
- Whether the area falls within the accepted geographic range of the types of vegetation present, or is an extension of that range.
- The condition of the vegetation in the area.
- The diversity of the flora present.
- The presence of rare species (particularly Declared Rare Flora) or priority taxa, poorly known species, poorly protected species or geographically restricted species.
- Whether any species present are at the limits of, or outside their known range.

4.1 DPaW Declared Rare and Priority Flora

Prior to the surveys a desktop survey was carried out through NatureMap to build a species list and to find out what species categorised as Declared rare Flora and Priority were present near the site (Appendix 6). None of the species on the list were

found within the site under study, however because of the limitations of the survey, they cannot be excluded.

4.2 Regional and Local Significance

The ecological criteria for classifying regional and local significance have recently been summarised by DEC (June 2007) as part of the South West Biodiversity Projects (SWBP). Five headings are considered within Table 1 of this publication:

1. regional representation;
2. diversity;
3. rarity;
4. maintenance of ecological processes or natural systems - connectivity; and/or
5. protection of wetland, streamline, estuarine or coastal natural areas

The first heading refers to “regional representation” whereby, if the area is not already recognised as being of international, national or local value, it is considered in the context of Swan Coastal Plain Vegetation Systems as described by (Hedde. E.M. 1980) and how much of the original extent of such systems remain (as at 2015).

As described in Section 2.3, Lot 123 Mortimer Road was mapped by Hedde et al 1980 as Bassendean Complex, Central and South which although not strongly represented in the conservation estate, are otherwise in the unusual position of having 31% of pre-European settlement area remaining. As described in the Bush Forever Report (2000) this percentage had declined to approximately 24% of pre-European settlement area remaining, of which 13% has now been protected by Bush Forever legislation.

There are several surrounding properties are protected under Bush Forever, as can be seen in figure 5. Of particular significances are sites 270, 273 and 348 as they are within a 5km radius of Lot 123 Mortimer Road, and have very similar floristic community types and account for 560.3Ha of protection. Consequently, the site can be considered to be “regionally” well representative. In addition as the block was not considered for protection under Bush Forever, suggesting that its regional significance is relatively inconsequential.

The criteria of diversity and rarity both score poorly. Based on the species richness for the floristic community types described by Gibson et al, the floristic communities present have lost between 55 and 75% of the species which may have been originally present. None of the taxa found are considered rare or priority species.

5. Flora Survey Results

5.1 Description of Quadrats

Quadrat MR01

Location	6431530 N 50 392837E
Landform	Depression surrounded 100m to the south, east and west by a gentle sloping sand dune.
Soil Type	White surface and dark grey/black Bassendean Sands >150mm, 90% surface litter of leaves.
Vegetation	Open shrubland of <i>Astartea fascicularis</i> , <i>Pericalymma ellipticum</i> over sedgeland.
Condition	Good to very good
Fire Age	+ 7 years
Search Intensity	95% of flora recorded
Quadrat size/shape	10 x 10m

Quadrat MR02

Location	6430846N 50 392794E
Landform	Gentle south east sloping sand dune.
Soil Type	White medium to coarse surface and light grey Bassendean Sands >150mm, 95% surface litter of Banksia leaves.
Vegetation	Open woodland of <i>Banksia attenuate</i> , and <i>Banksia menziesii</i> over low shrubland, over sedgeland.
Condition	Poor to good
Fire Age	+ 7 years
Search Intensity	95% of flora recorded
Quadrat size/shape	10 x 10m

Quadrat MR03

Location	6431246N 50 392642E
Landform	Low lying valley
Soil Type	Moss covered dark peaty soil.
Vegetation	Open woodland of <i>Melaleuca raphiophylla</i> , <i>Eucalyptus marginate</i> , <i>Corymbia calophylla</i> and <i>Allocasuarina fraseriana</i> over shrubland over dense sedgeland.
Condition	Poor to good
Fire Age	≈ 5 years
Search Intensity	95% of flora recorded
Quadrat size/shape	10 x 10m

Quadrat MR04

Location	6431650N 50 392857E
Landform	Flat plain, 40m east of gentle rising sand dune.
Soil Type	White medium to coarse surface and grey/black Bassendean Sands >150mm, 5% bare soil surface.
Vegetation	Low open woodland of <i>Corymbia calophylla</i> , over open shrubland of <i>Pericalymma ellipticum</i> over open sedgeland.
Condition	Poor to good
Fire Age	+ 7 years

Search Intensity	90% of flora recorded
Quadrat size/shape	10 x 10m

Quadrat MR05

Location	6431480N 50 392710E
Landform	Swale with gentle slope to the south west.
Soil Type	White/creamy brown medium textured Bassendean Sands, with poorly developed humus layer.
Vegetation	Open woodland of <i>Banksia attenuate</i> , <i>Banksia menziesii</i> and <i>Banksia illicifolia</i> , over open low heath
Condition	Very good
Fire Age	≈ 5 years
Search Intensity	95% of flora recorded
Quadrat size/shape	10 x 10m

Quadrat MR06

Location	6430849N 50 392968E
Landform	Gently sloping east facing sand dune.
Soil Type	White/yellow Bassendean Sands, with surface litter of <i>Banksia</i> leaves.
Vegetation	Open woodland of <i>Eucalyptus marginate</i> , <i>Banksia attenuate</i> and <i>Banksia menziesii</i> over shrubland
Condition	Very good
Fire Age	+ 7 years
Search Intensity	95% of flora recorded
Quadrat size/shape	10 x 10m

5.2 Vegetation Survey Results

The concept of vegetation complexes for the Swan Coastal Plain was developed in the recognition that different vegetation types grow in soils with different geomorphic characteristics (Hedde, E.M. 1980) Vegetation complexes can be considered as broad ecosystems that contain a range of habitats depending on relief, aspect and local geomorphology. Gibson *et al* (1994) extended the previous work by Hedde *et al* (1980), by identifying 43 vegetation subtypes.

Of the 43 subtypes, 11 occur within the Bassendean system, and of these, three were represented within Lot 123 Mortimer Road.

1. Type 4 - *Melaleuca preissiana* damplands.
2. Type 21a - *Banksia attenuate* / *Eucalyptus marginata* woodlands.
3. Type 23a - Central *Banksia attenuata* / *Banksia menziesii* woodland

In general, the site is open *Banksia*-*Eucalyptus* woodland with *Banksia attenuata*, *Banksia menziesii* and, to a lesser extent, *Banksia illicifolia* the defining species

throughout. *Eucalyptus marginata*, *Eucalyptus tottiana* and *Corymbia calophylla* are also common, becoming more densely populated at greater elevation of type 21a. The overstorey of type 21c is noticeably dominated by *Allocasuarina fraseriana* however *B. attenuata*, and *Eucalyptus marginate* remain dominant. With the exception of type 4, areas differ mainly in the understorey - commonly dominated for example by *Hibbertia hypericoides*, *Eremaea pauciflora*, *Stirlingia latifolia* and/or *Conostylis aculeata*. Some areas within type 21a have considerable weed incursion (mainly *Ehrharta calycina*).

Low lying areas, or type 4 areas, are defined by a sparse *Melaleuca preissiana* overstorey with occasional *C. calophylla*, *X. preissii* and *Nuytsia floribunda*. The understorey of the CCW is dominated largely by shrub and herbaceous species common to damplands. Table 2 summarises the dominant vegetation in each area.

6. Vegetation Condition

6.1 Condition Scoring System Used

In Western Australia, particularly on the Swan Coastal Plain, vegetation condition reporting has become an important tool for judging the relative conservation value of bushland, particularly for areas being considered for either conservation or clearing to urbanization. The rationale is that biodiversity conservation is much harder in severely degraded bushland, but more easily and cost effectively implemented for bushland in good condition.

The first published condition rating method was by Trudgen in the early 1990's, who broke condition into 6 groupings, ranging from excellent to completely degraded, with intermediate grading of very good, good, poor and very poor.

Later Keighery, acknowledging Trudgen, modified the names and descriptions of the various divisions. This was adopted in the Bush Forever publications, and since 2000 has been widely cited. Accordingly, we have sought to rate vegetation condition objectively, using the same criteria adopted by Trudgen and by Keighery (Table 3).

The factors they mention which impact on condition are physical disturbance, pests and disease and weed invasion. Collectively these reduce "naturalness", reduce native biodiversity and promote the "unnatural selection" of hardy and robust taxa over more delicate and sensitive species.

Physical disturbances in Perth's bushland range from gross disturbance such as logging for timber (mostly of Jarrah), grazing, clearing for farming, filling, domestic gardening, digging of soaks and drains and for sand, and the dumping of rubbish. Sometimes past clearing is obscured by regrowth, however in the Bassendean sands areas; there is typically a dominance of pioneering species such as *Kunzea*

glabrescens or *Adenanthos obovatus* at levels of dominance not seen in undisturbed land. Grazing, depending on the livestock, typically selectively reduces the middle storey and succulent natives, leaving tuberous or spikey species.

The major disease is die-back, caused by *Phytophthora cinnamomi*. This fungus kills a wide range of native flora with about 50% of the Swan Coastal Plain flora susceptible. Devastation is worst in the jarrah forest flora of the Darling Scarp, however there are serious impacts in the Eucalyptus and Banksia woodlands of the Swan Coastal Plain. The parasite is best suited to wet, but not anaerobic soils which are somewhat acidic. Accordingly, disease impact is least on the waterlogged anaerobic soils of wetlands, and the neutral to alkaline Quindalup and Spearwood sands whereas impacts are greatest on the acidic Bassendean sands.

Pests are most commonly rabbits which are selective feeders on more succulent plants, and can create substantial ground disturbance by building substantial burrows.

Weeds are plants which are not native to the area (being introduced from overseas or from other Australian botanic provenances), and by virtue of their biology and/or the absence of natural controls, are well adapted to local conditions and thrive at the expense of native flora. Impacts on native flora can be either because of the very robust and aggressive growth rate choking other plants, or by active inhibition of competing plants (allelopathy).

6.2 Disturbances and Condition Reporting at Mortimer Road

In general the bushland is in quite good condition. Weed incursions have been largely restricted to the southern end of the property and along the edges of tracks and boundaries. There has also been some disturbance associated with the dumping of rubbish and/or vehicles. Fires do not appear to have been very regular.

Within the CCW *M. preissiana* are sparse and older trees appear to be stressed. Little or no regeneration of the species appears to have occurred in recent years. There is also some evidence that *C. calophylla* is encroaching on the area and this may indicate a period of reduced water table levels.

7. 2015 Vegetation survey

A further survey was carried out in September 2015, on the request of the owner. This was a modified brief survey which involved three ecologists walking along a transect through the site, recording large trees for a Black cockatoo survey and recording species of plants as they walked. The survey aimed to include all of the vegetation types described in the 2008 study.

Prior to the 2015 survey FloraBase and NatureBase desktop surveys were carried out to determine any priority species in the area. The results are included in Appendix 6.

7.1 Limitations of the Flora Survey

The survey was restricted to the flowering plants in the survey areas, even though a number of fungi, mosses and lichens were observed (particularly in wetter areas).

Due to time constraints, less time was spent in the field than was ideal. It is therefore likely that some species of very restricted distribution or very small population size may have been missed. A number of ephemeral species and species which had either already flowered or were not in flower may also have been overlooked.

7.2 Vegetation Survey Results

The flora list produced in 2008 was used as a checklist for species and plants that had already been identified on the site were simply marked as being present (Appendix 2). New species were added to the list and any unknown species were photographed for later identification.

In all 12 new species were added to the original list (Appendix 2). In addition the survey highlighted an area which could not be described by any of the three originally surveyed vegetation Complexes. It was therefore decided that a separate complex needed to be added:

Type 22 - *Banksia illicifolia* woodlands

7.3 Vegetation Condition

The vegetation was in very good to excellent condition overall (Keighery, Gibson et al. 2007). Some areas had been invaded by weeds, but this was generally limited to areas adjacent to fire breaks. The worst weed invasions were on the perimeter track, but there were some areas on the lateral tracks which were also affected. The main invasive weeds were *Ehrharta calycina* and *Briza* sp. but *Watsonia meriana* and *Zantedeschia aethiopica* were also noted in the bushland, as individual plants.

8. Black Cockatoo Survey

The requirements of the survey are to assess potential breeding and feeding habitat on the site.

8.1 Methodology

8.1.1 Black Cockatoo Breeding and Feeding Habitat Assessment

The habitat assessment for black cockatoos was carried out in accordance with the EPBC Act referral guidelines for the three threatened black cockatoo species (SEWPaC 2012). An experienced ecologist carried out a systematic and thorough search of the site on the 3rd July 2015.

The assessment of foraging habitat was based on the EBPC Act Environmental Offset Policy 2012, which incorporates a general guide to offset assessment including broad criteria for determining habitat quality, based on the broad site characteristics, site condition and site context. A set of specific criteria relevant to Black Cockatoo foraging habitat quality were compiled for the field assessment and used as a basis for mapping habitat quality. The habitat quality was assessed for each habitat type within the project area. Appendix 3 shows the criteria and scoring method used. Habitat quality was assessed, based on the combined score of all the criteria total scores (where: 0-5 = low, 6-10 = moderate, 11 - 15 = good, 16 - 21 = excellent).

All Jarrah (*Eucalyptus Marginata*) and Marri (*Corymbia calophylla*) trees with diameter at breast height of greater than 50 cm were recorded as waypoint locations (i.e. by use of GPS) along with other relevant tree data such as presence of potential hollows (Appendix 5). Evidence of cockatoo foraging activity, or individuals observed, was also recorded across the site. Other potential habitat trees found in the area were also assessed, including *Eucalyptus todtiana* (Prickly bark) and *Eucalyptus gomphocephala* (Tuart)

8.2 Results

8.2.1 Black Cockatoo Habitat Assessment

The majority of the site was uncleared, and the large trees and shrubs that were present were native (Appendix 3). The majority of the trees present were Banksias, mainly, *Banksia menziesii*, *Banksia attenuata* and *Banksia illicifolia*. There were also some large *Eucalyptus marginata*, *Corymbia calophylla* and *Eucalyptus gomphocephala*. One area described as a CCW Dampland had large *Melaleuca preissiana* present, but were in poor condition. There was a great deal of seedling recruitment on the property, mainly banksias but also some of the eucalypts and to a very minor extent the melaleucas.

8.2.2 Black Cockatoo Feeding Habitat Assessment

Although no Black cockatoos were present during the most recent site visit, their calls were noted during the transect. The majority of the site contains species of plant

which are known to provide foraging for black cockatoo species, in particular the Baudin's Cockatoo, which feeds on a wide variety of shrubs and trees.

8.2.3 Black Cockatoo Breeding Habitat Assessment

Thirty-two trees were identified as potential breeding trees (trees with a diameter at breast height of greater than 50 cm) across the site (Appendix 5). The trees recorded were Jarrah (*Eucalyptus marginata*), Marri (*Corymbia calophylla*) and Tuart (*Eucalyptus gomphocephala*).

8.3 Discussion

8.3.1 Breeding Habitat Assessment

The site contains 32 trees assessed as potential breeding trees for Carnaby's Black Cockatoo in reference to the definition in the referral guidelines (SEWPaC 2012). All of these trees contained potential nesting hollows or hollows forming. It should be noted that in assessing potential breeding habitat for black cockatoos, the tree diameter measurement is recognized as a reliable and precise measurement, whereas the visual detection of actual hollows is known to be unreliable, particularly via ground based assessment. However, SEWPaC considers that all trees with diameter at breast height greater than 50 cm have the potential to form hollows suitable for cockatoo nesting. This takes into consideration medium term changes in breeding patterns of Black Cockatoo (SEWPaC 2012).

The majority of the potential breeding trees were Marri and Jarrah trees. Marri trees are considered to be a preferred breeding tree species for Forrest red tailed cockatoos based on recorded usage. Very little is known about Baudin's Black-Cockatoo breeding biology, such as its breeding range, timing of nesting events, nest tree and nest hollow characteristics, clutch size, incubation period, fledging period and nesting success (Johnstone; and Storr; 1998) as the nests are extremely difficult to locate. Most characteristics of the species' biology are inferred from Carnaby's Black-Cockatoo. There are several records of Carnaby's Black Cockatoo breeding within Marri trees (Johnstone, Kirby et al. 2013). There is anecdotal evidence of Carnaby's Black Cockatoo nesting in Jarrah hollows. Based on documented breeding occurrences, Jarrah trees are considered to be a less frequently used tree species for breeding. All of the three cockatoo species are found in the vicinity as part of their natural range (Figures 4-6).

8.3.2 Foraging Habitat Assessment

The Forrest Red Tail, Baudin's and Carnaby's cockatoo are all commonly spotted species in the area.

Overall, Marri (*Corymbia calophylla*) is the primary food source with the Baudin's

Black-Cockatoo using its seeds, flowers, nectar and buds (Johnstone & Kirby 2008). For instance, seeds of Marri were found in 89% of birds (n=58) collected in forest (Saunders 1974) and of 34 foraging groups observed throughout the range of the species, 31 (91%) were seen feeding in Marri (Saunders, Mawson et al. 2014). In years when the Marri fails to flower, or flowers poorly, damage by this cockatoo to cultivated fruits is most severe (Johnstone, Kirby et al. 2013).

Baudin's Black-Cockatoo has also been observed feeding on a range of foods including the seeds of Jarrah, Western Sheoak (*Allocasuarina fraseriana*), Bull Banksia (*Banksia grandis*), Mountain Banksia (*Banksia quercifolia*), River Banksia (*Banksia littoralis*), Holly-leaved Banksia (*Banksia ilicifolia*), *Banksia sessilis*, *Banksia squarrosa*, Cut-leaf Banksia (*Banksia praemorsa*), *Hakea erinacea*, *Hakea prostrata*, *Hakea stenocarpa*, *Hakea trifurcata*, *Hakea lasianthoides*, *Hakea ruscifolia*, *Hakea lissocarpha*, *Hakea varia*, *Hakea cristata*, *Hakea marginata*, Wilson's Grevillea (*Grevillea wilsonii*), Balga / Grass Tree (*Xanthorrhoea preissii*), *Kingia australis*, *Reedia* (*Reedia spathacea*), Radiata Pine (*Pinus radiata*), *Erodium* spp. (including *E. botrys*), *Jacaranda* spp., *Macadamia* spp., Pecan (*Careya illinoensis*), Apples (*Malus* spp.), Pears (*Pyrus* spp.), Persimmons (*Diospyros* spp.) and *Quercus* spp.

They also take insect larvae and insects (including beetle, wasp and moth larvae) from under bark and in the wood of live and dead trees, from galls and from flower spikes of *Xanthorrhoea*; the pith of Tall Kangaroo Paw (*Anigozanthos flavidus*); the juice of ripe persimmons; and the growing tips of *Pinus* spp. (Johnstone & Kirby 2008). Bark and dead wood are stripped from trees (e.g. Jarrah, Marri) in search of insect larvae (Higgins 1999; (Johnstone; and Storr; 1998, Saunders, Mawson et al. 2014). It occasionally forages on the ground, searching among and feeding on *Erodium*, taking seed from fallen fruits or gumnuts, and extracting insect larvae from beneath the bark of fallen trees (Saunders 1974).

Ninety percent of the Forest Red-tailed Black Cockatoo total diet consists of Marri and Jarrah seeds (Yeap, Shephard et al. 2015) and it depends on both feed trees during breeding periods (Johnstone et al. 2013). Marri trees with a high fruit yield in one year require at least three years to replenish sufficient resources to fruit successfully again (Mawson and Long 1995)). Other feed trees include Blackbutt, Albany Blackbutt (*E. staeri*), Forest Sheoak (*Allocasuarina torulosa*), Snottygobble (*Persoonia* spp.) and the non-indigenous native Spotted Gum (*E. maculata*) and Cape Lilac (Johnstone & Kirkby 1999;(Johnstone; and Storr; 1998).

A detailed study of the food and feeding behaviour of the Forest Red-tailed Black Cockatoo was conducted at Bungendore Park and Jarrahdale, from 1996-99 (Johnstone & Kirkby 1999). During the study, the birds fed on Marri throughout the year but switched to Jarrah and other foods in March and June when Marri fruits were less abundant. The subspecies also appeared to return to individual trees to feed, on

a daily basis, until the supply of fruit was exhausted (Johnstone & Kirkby 1999). The production of Marri fruit takes about 17 months from bud initiation (Mawson 1995). In most years, only about 20-50% of Marri trees produce a large crop of fruits and a small proportion of the trees produce only male flowers, which fail to fruit (Mawson 1995). The slow and patchy flowering and seeding of Marri trees, highlights the need for foraging habitat to consist of a mosaic of tree species and age classes.

Both Baudin's and Forest Red-tailed Black Cockatoos are frequently found feeding in the Marri / Jarrah forests of the nearby darling Scarp.

Carnaby's cockatoo feed on a wider variety of foods, including a number of banksia species, Dryandra, Hakea, Grevillea, a large variety of Gums including Marri and Jarrah. They also feed on a number of introduced species such as the Pine and Jacaranda trees (Johnstone & Kirkby 1999),

Although no foraging was observed on site on the day of the survey, evidence of foraging was detected; chewed nuts from Marri trees were collected, which were identified as having been chewed by Carnaby's Cockatoo.

8.4 Conclusions

8.4.1 *Black Cockatoo Foraging Habitat*

The survey methodology is based on the information currently available on black cockatoos and the EPBC Act referral guidelines (SEWPaC 2012). These guidelines state that there is a high risk of significant impact if a proposal involves 'the clearing of more than 1 hectare of quality foraging habitat' (Appendix 4). The total area of the development is approximately 45 Ha. The entire property can be described as quality foraging habitat for the Black Cockatoos, (with the possible exception of Forrest Red tailed Black Cockatoos).

8.4.2 *Black Cockatoo Breeding Habitat*

The site contains species of trees (Marri, Jarrah and Tuart) listed, within the guidelines, as known to support breeding cockatoos, with diameter at breast height of greater than 50cms (Appendix 5 & Figure 6). Therefore, by definition it is deemed as potential breeding habitat. It is uncertain whether changes in breeding range of all species of Black Cockatoos will extend their breeding range to within the site. However, SEWPaC maps indicate that both the Carnaby's and Forrest Red Tailed Black Cockatoos are found in the area and that it is definitely in the breeding area of Carnaby's Cockatoos. Too little is known about the breeding habitats of the Red Tailed Black Cockatoos to be certain.

8.4.3 Carnaby's Cockatoo

Breeding occurs mainly from early July to mid-December in the semiarid and sub humid interior. There has been an apparent shift in its breeding range further west and south since the middle of last century with a more rapid increase in the past 10–30 years into the Jarrah-Marri forests of the Darling Scarp and the Tuart forests of the Swan Coastal Plain. There are now numerous breeding records for the northern Darling Scarp. Including: near Canning Dam, near Wungong Dam, Serpentine and near Collie, and on the Swan Coastal near Mandurah, Lake Clifton and near Bunbury (Storr-Johnstone Bird Data Bank).

There is also an indication that this species is expanding its breeding range in the far south-east i.e. Lake Cronin, Lake King and Ravensthorpe region.

8.4.4 Baudin's Cockatoo

There is very little breeding information and the breeding biology of this species is poorly known. Recorded breeding in deep south-west, north to the Whicher Range and Lowden and also records at Wungong Catchment, Serpentine (hills area) and east to Kojonup and near Albany. They nest in large, mostly vertical, hollows of Karri (*Eucalyptus diversicolor*), Marri (*Corymbia calophylla*), Wandoo (*Eucalyptus wandoo*) and Bullich (*Eucalyptus megacarpa*). Baudin's Cockatoos display strong pair bonds are monogamous, and probably mate for life and the pair remain together all year round. Pairs have also been recorded prospecting for hollows in most months and also outside the breeding range. Egg laying is recorded in August, September, October, November and December.

Following breeding, the birds leave the nesting areas and family groups then amalgamate to form larger foraging flocks. The flocks begin to arrive at non-breeding traditional roosts in the central and northern parts of the Darling Scarp. The largest groups (600+) being recorded between April and September with some foraging out onto the southern Swan Coastal Plain to areas such as Kelmscott, Mundijong, Serpentine, Pinjarra, Harvey, Myalup, Bunbury, Capel, Tutunup, Busselton, Dunsborough and Meelup. Judging from recent surveys (Johnstone. and Kirkby 2008a) for the groups of birds that have spent the non-breeding season in the Perth hills districts, there appears to be a definite shift westward onto the southern Swan Coastal Plain, just prior to the flocks moving south to breed.

8.4.5 Forest Red Tailed Black Cockatoos

Breeding has been recorded from February to December (with a peak between October and December, also a peak in some years in April–May). The Forest Red-tailed Black Cockatoo nests in large hollows of Marri (*Corymbia calophylla*), Jarrah

(*Eucalyptus marginata*), Wandoo (*Eucalyptus wandoo*), Bullich (*Eucalyptus megacarpa*), Tuart (*Eucalyptus gomphocephala*) and Karri (*Eucalyptus diversicolor*).

On the Swan Coastal Plain breeding has been recorded in November–December. Birds begin to breed at 4+ years of age. This species favours large top entry hollows with entrances ranging from 12–14 cm in diameter and hollow depth 1–5 metres.

9. Conclusions and Recommendations

9.1 Vegetation

The site contains vegetation in very good to excellent condition and although no DRF or priority species were identified, their presence cannot be completely dismissed. If the development was to go ahead it would be advisable to carry out a level 1 survey in the affected areas.

9.2 Black Cockatoos

If the proposed development involves the clearing of potential breeding trees (breeding habitat), then there is a high risk of significant impact and the project should be referred for Federal approval.

As the development is likely to require clearing of an area greater than 1Ha there is also a high risk of significant impact upon the foraging habitat of the Black Cockatoos and there is a requirement to refer the proposal for Federal approval.

The two criteria: breeding and foraging habitat are considered separately under the Federal referral guidelines, and there is a requirement to refer based on impact on breeding habitat and Foraging habitat. Once the area of trees that will be impacted is known, then it would be advisable to liaise with SEWPaC about federal referral.

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Figures

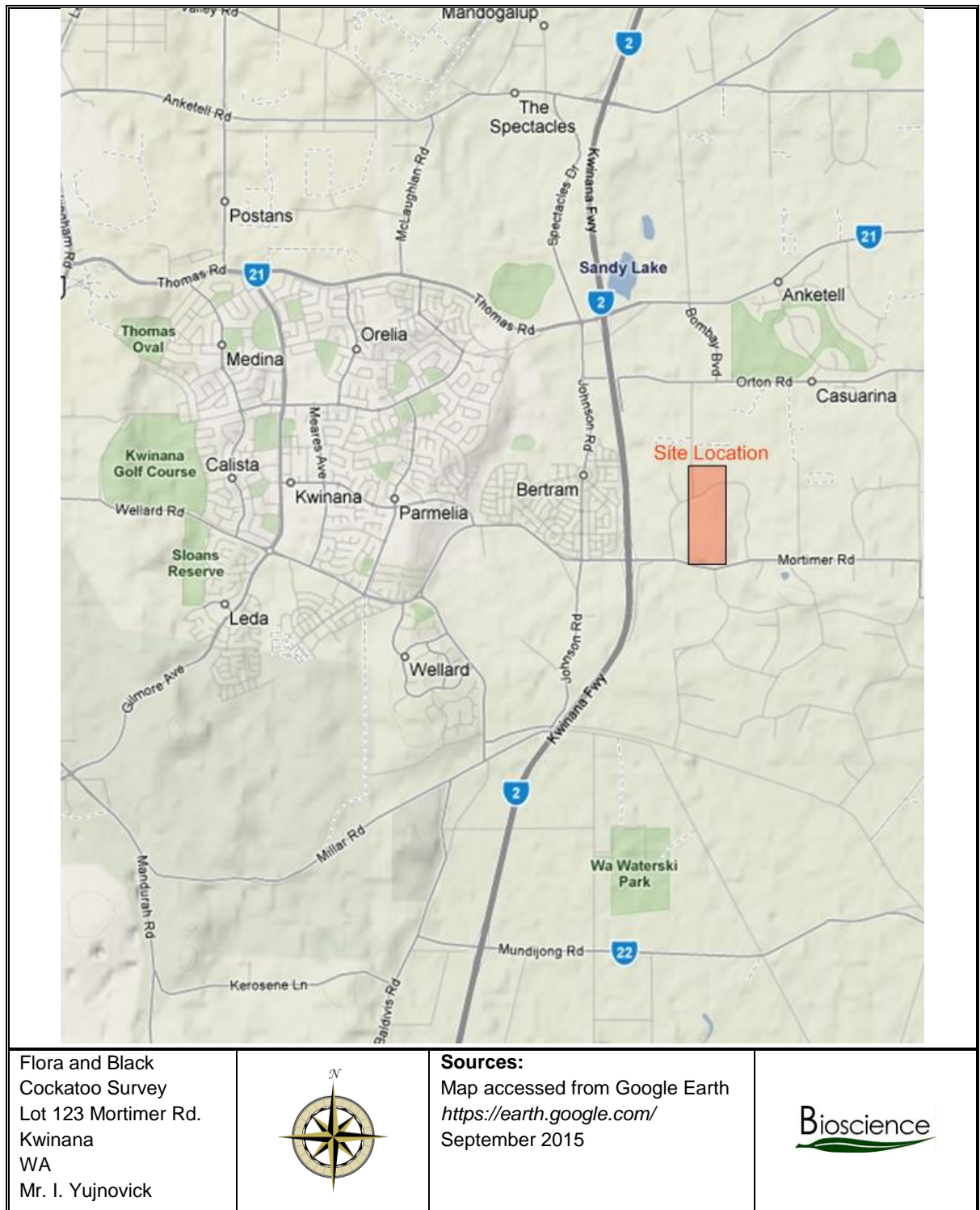
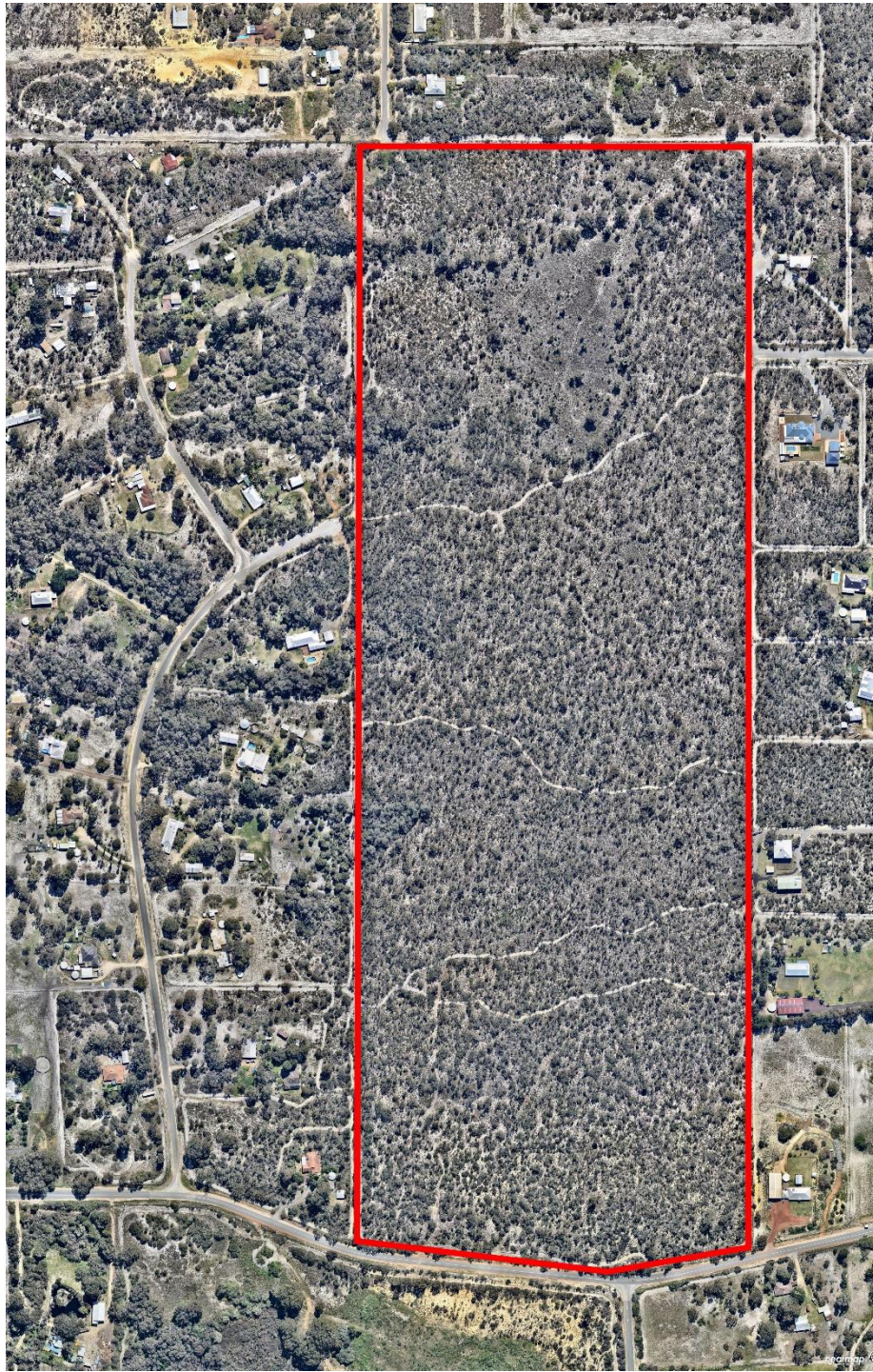


Figure 1. Site Location



Flora and Black
Cockatoo Survey
Lot 123 Mortimer Rd.
Kwinana
WA
Mr. I. Yujnovick



Sources:
Map accessed from Nearmap
maps.au.nearmap.com
September 2015



Figure 2. Site Plan

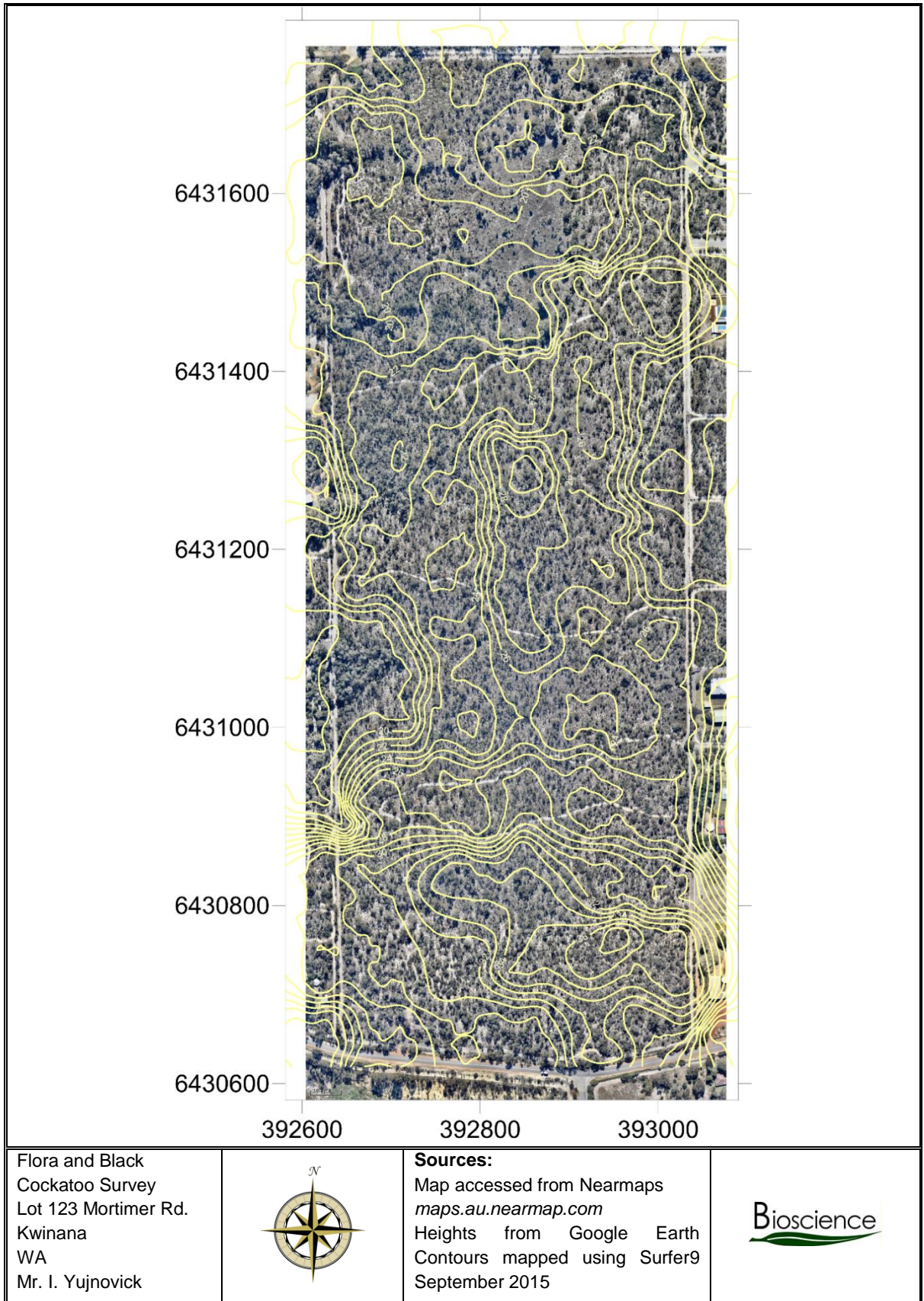


Figure 3 Site Topography

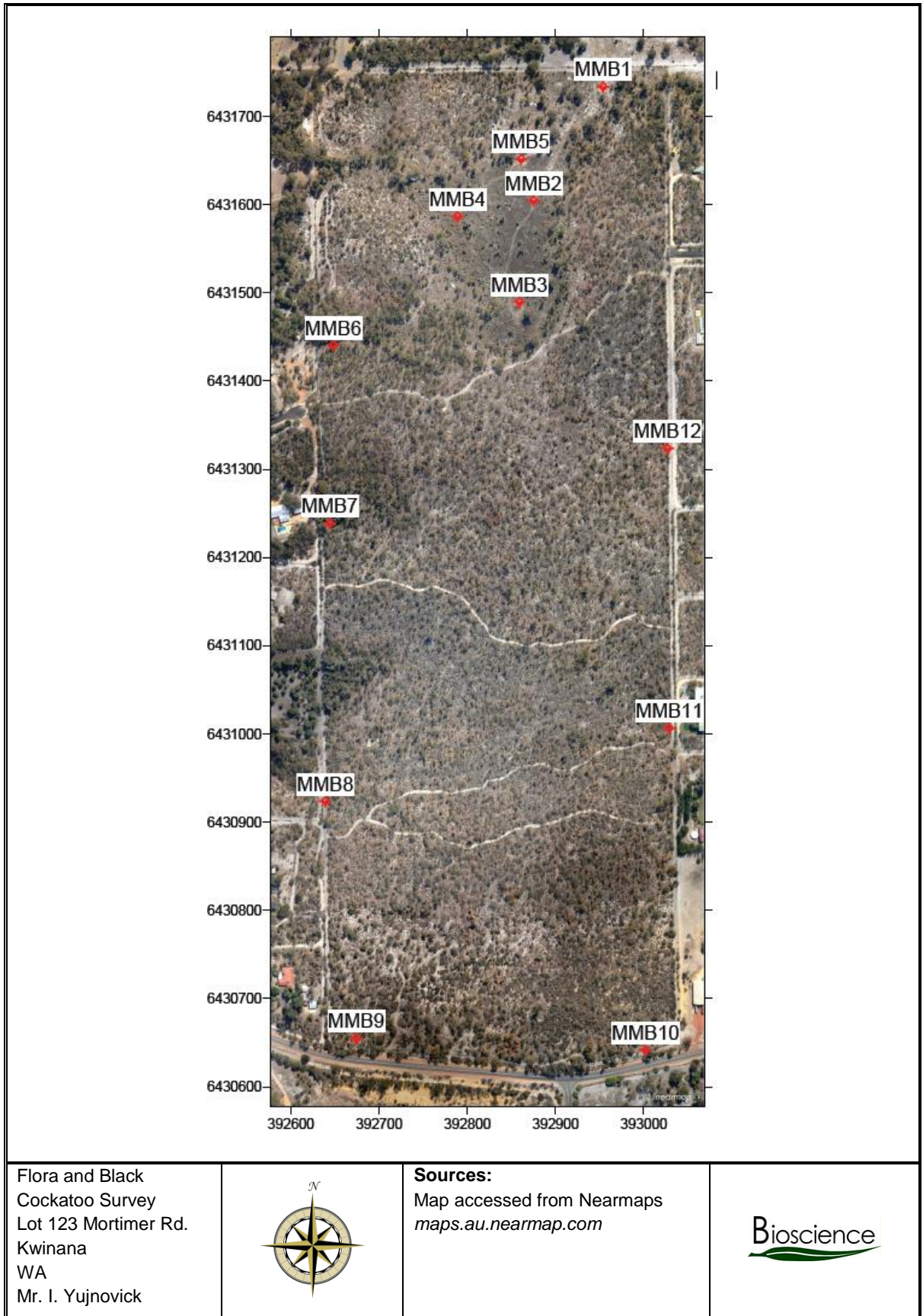


Figure 4 Bore Hole Sites

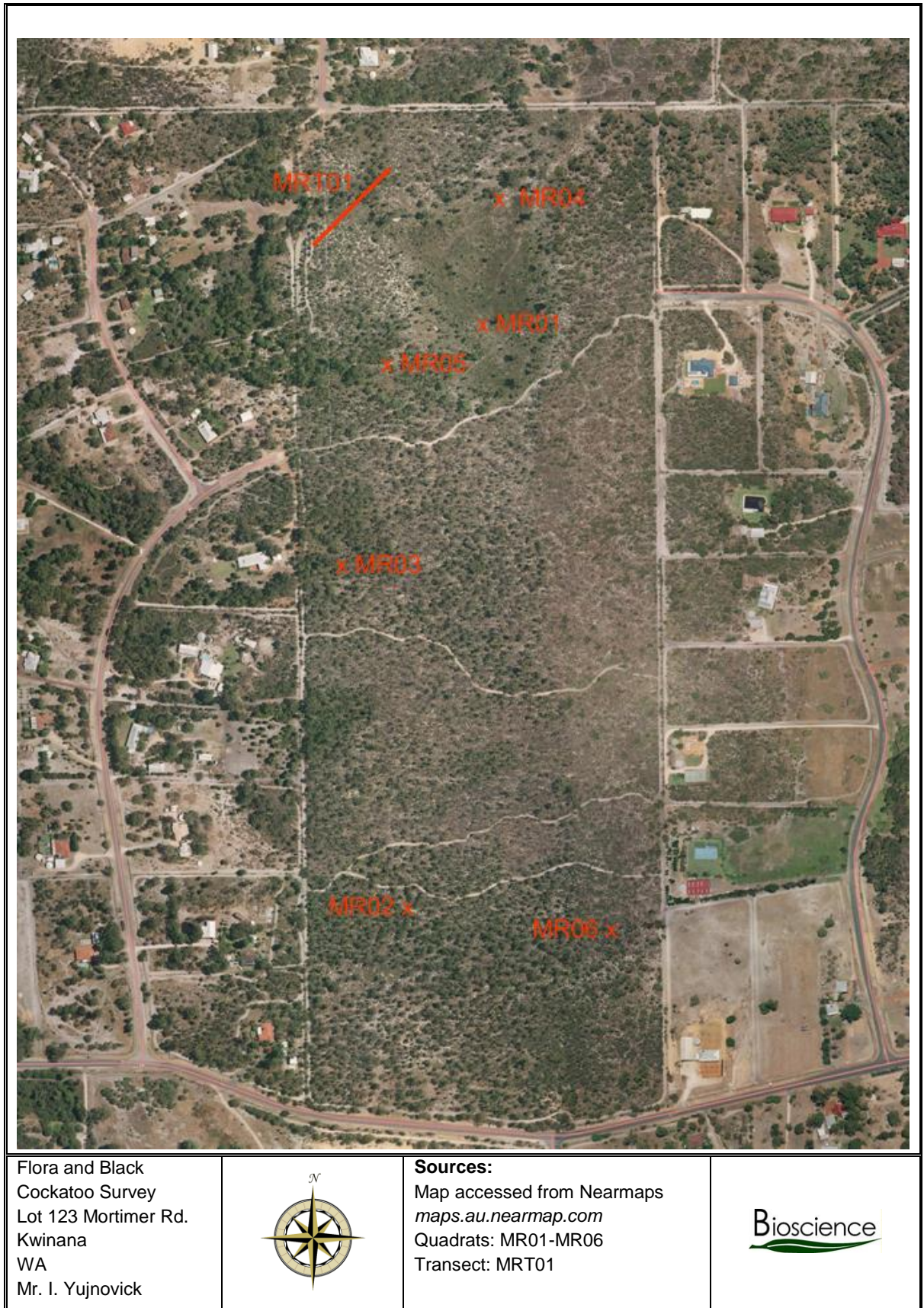


Figure 5. Evaporation Data

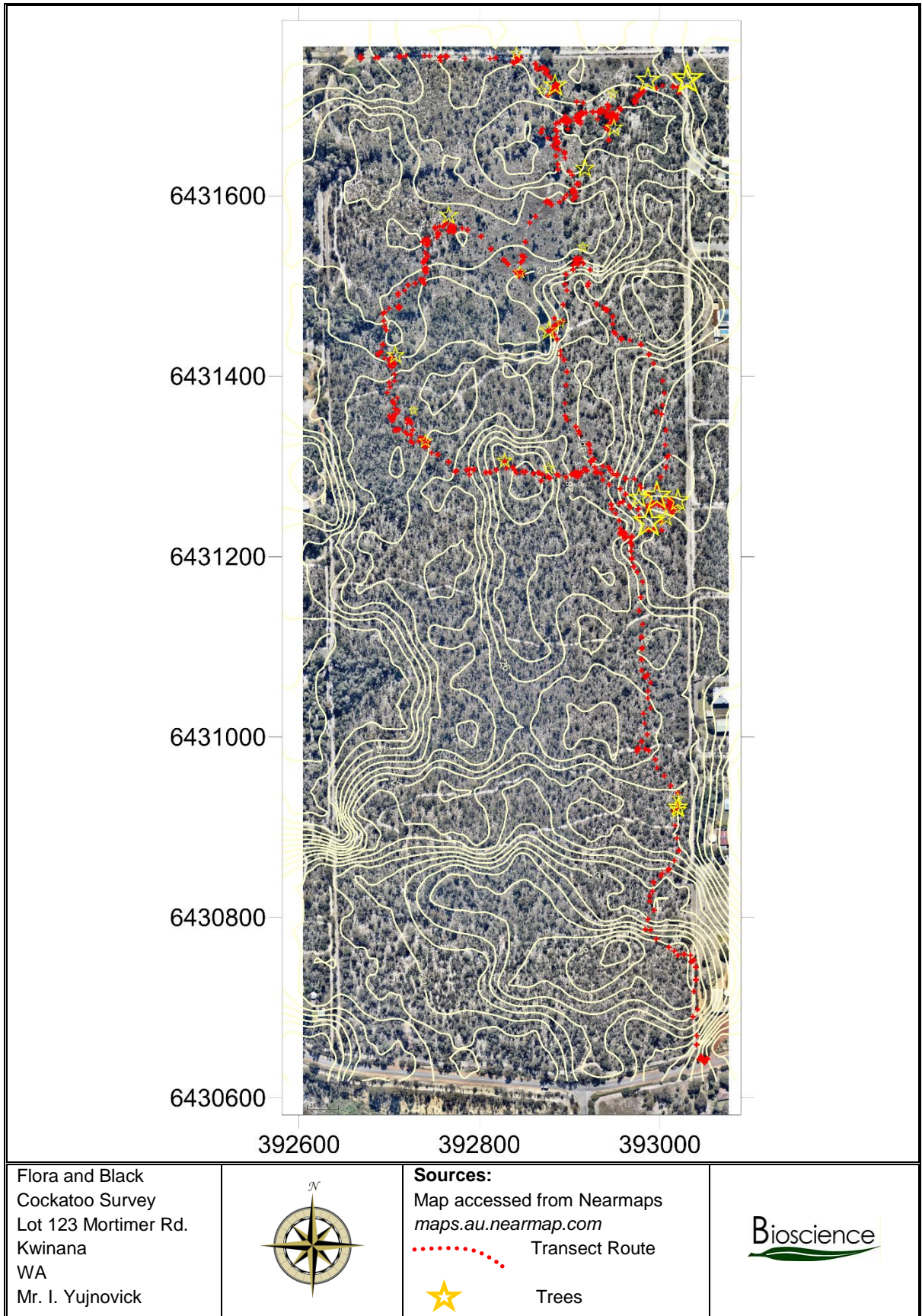


Figure 6 Site Topography

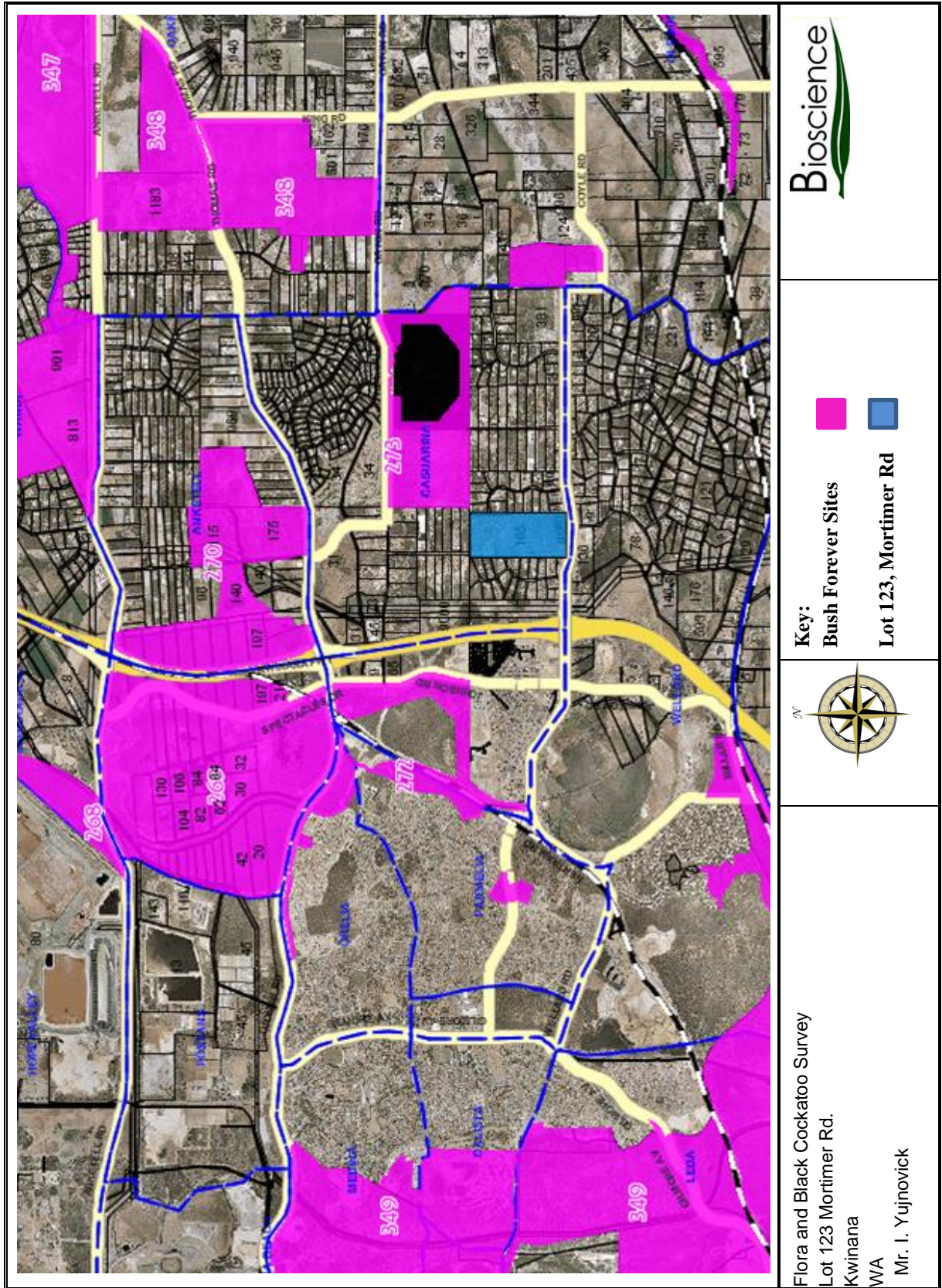
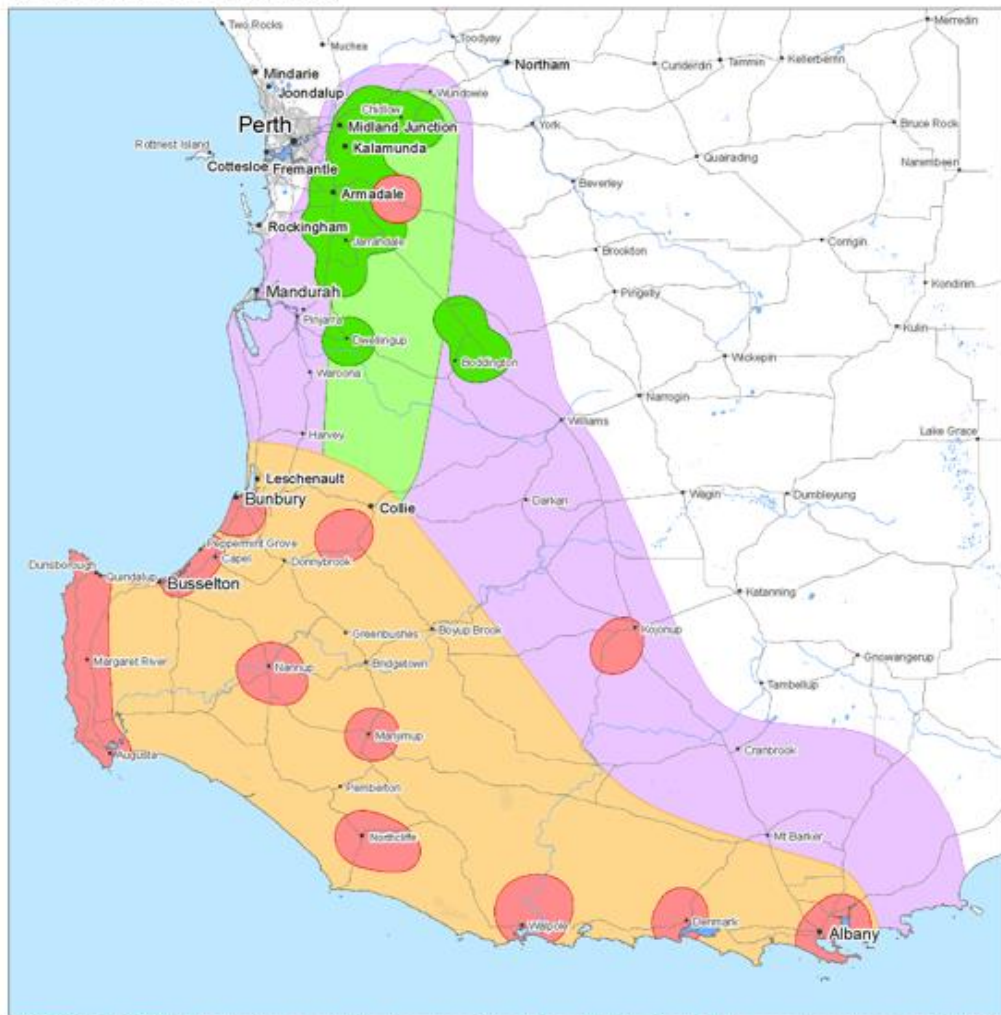


Figure 7. Bush Forever Sites in the Vicinity of Lot 123 Mortimer Rd.

Map 1: Modelled distribution of Baudin's black cockatoo (*Calyptorhynchus baudinii*)



INDICATIVE MAP ONLY: For the latest departmental information, please refer to the Protected Matters Search Tool at www.environment.gov.au/epb/index.html




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Contextual data sources:
 DEWHA (2009), Collaborative Australian Protected Areas Database
 Geoscience Australia (2006), Geodata Topo 250K Topographic Data

Legend

- Known Breeding Areas
- Predicted Breeding Range
- Known Foraging Areas
- Main Wintering Area
- Species Likely to Occur
- Cities & Towns
- Roads
- Major Rivers
- Lakes

Please Note: Known breeding areas represent locations known to be used by birds for breeding as at December 2009. As habitat has been lost in traditional breeding areas, birds have begun breeding at new locations. Distribution created and verified using point locations in SPRAT database (DSEWPaC, 2011) and from expert feedback (R. Johnstone, 2011).

CAVEAT: The information presented in this map has been provided by a range of groups and agencies. While every effort has been made to ensure accuracy and completeness, no guarantee is given, nor responsibility taken by the Commonwealth for errors or omissions, and the Commonwealth does not accept responsibility in respect of any information or advice given in relation to, or as a consequence of, anything contained herein.
INDICATIVE MAP ONLY: This map has been compiled from datasets with a range of geographic scales and quality. Species or ecological community distributions are indicative only and not to be used for local assessment. Local knowledge and information should be sought to confirm the presence of the species, or species habitat, at the location of interest.

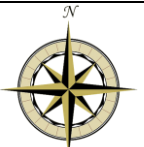

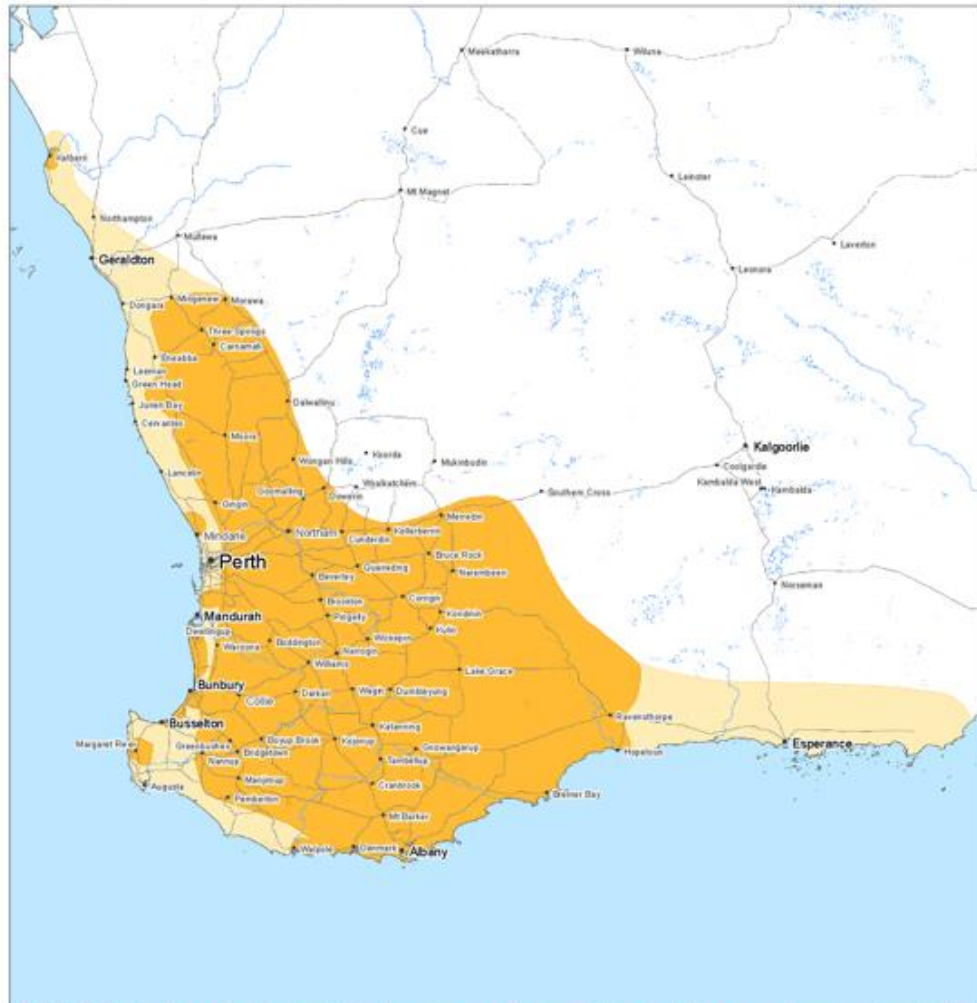
Flora and Black Cockatoo Survey Lot 123 Mortimer Rd. Kwinana WA Mr. I. Yujnovick		Sources: Map extracted from: DSEWPaC Accessed: 9/07/2015	
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Figure 8. Distribution of Baudin's Black Cockatoo

Map 2: Modelled distribution of Carnaby's black cockatoo (*Calyptorhynchus latirostris*)



INDICATIVE MAP ONLY: For the latest departmental information, please refer to the Protected Matters Search Tool at www.environment.gov.au/epbo/index.html



0 50 100 150 200 250 km



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Cartographical data source:
DEWHA (2006), Collaborative Australian Protected Areas Database
Geoscience Australia (2006), Shuttle Radar Topography Data

Legend

- Breeding Range
- Non-breeding Range
- Roads
- Major Rivers
- Lakes
- Cities & Towns

Please Note: The breeding range represents the areas known to be used by birds for breeding as at December 2009. As habitat has been lost in traditional breeding areas, birds have begun breeding at new locations. Distribution created and verified using point locations in SPRAT database (DSEWPoC, 2011) and from expert feedback (R. Johnstone, 2011).

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Sources:
Map extracted from:
DSEWPoC
Accessed: 9/07/2015



Figure 9. Distribution of Carnaby's Black Cockatoo

Map 3: Modelled distribution of forest red-tailed black cockatoo (*Calyptorhynchus banksii naso*)



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 DEWHA (2008), Collaborative Australian Protected Areas Database
 Geoscience Australia (2006), Shaded Relief 250m Topographic Data

Legend

- Species May Occur
- Cities & Towns
- Roads
- Major Rivers
- Lakes

Please Note: Distribution created and verified using point locations in SPRAT database (DSEWPoC, 2011) and from expert feedback (R. Johnstone, 2011).

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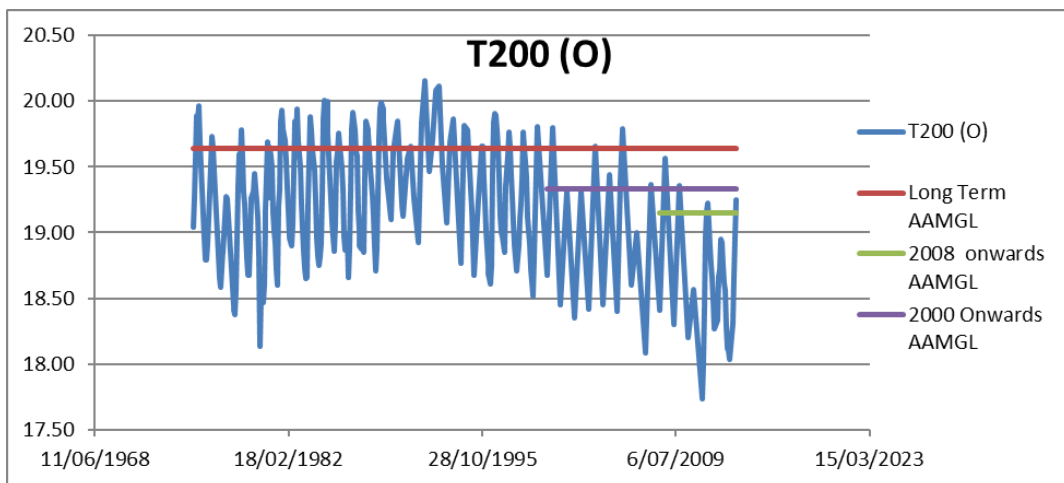
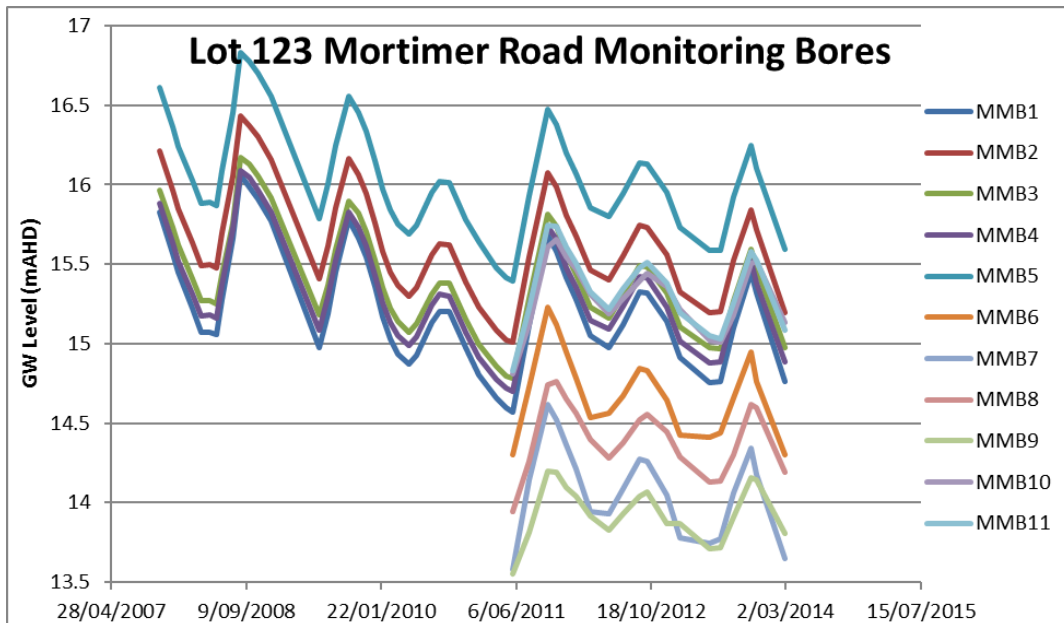
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Sources:
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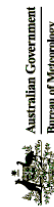
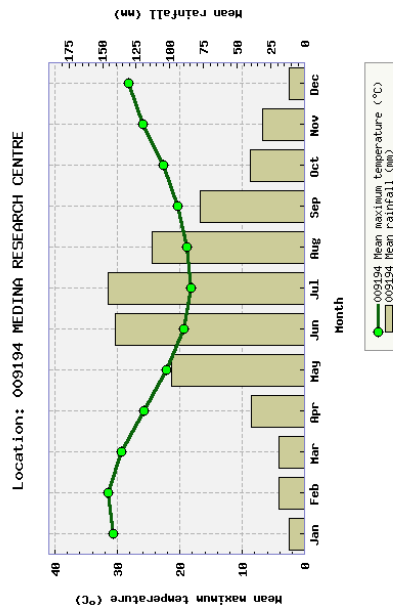
Figure 10. Distribution of Forest Red-Tailed Black Cockatoo



<p>Flora and Black Cockatoo Survey Lot 123 Mortimer Rd. Kwinana WA Mr. I. Yujnovick</p>		<p>Sources: Bioscience and Department of Water Monitoring</p>	
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Table 1 – Groundwater Monitoring Data

Statistics	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Mean maximum temperature (°C)	30.7	31.5	29.3	25.7	22.1	19.4	18.3	18.9	20.3	22.7	26	28.2	24.4
Highest temperature (°C)	44.9	45.8	43.3	38.1	32.9	26.5	25.8	28	34	37.8	41.4	45	45.8
Mean minimum temperature (°C)	17.1	17.6	16	13.4	10.5	9	8.2	8.2	9.2	10.4	13.4	15.1	12.3
Lowest temperature (°C)	4.8	6.4	4.5	2.4	2	-2	-1	-0.8	0.4	0.7	3.1	4.4	-2
Mean rainfall (mm)	11.5	18.8	19.3	39.4	98.5	140.8	145.9	113	77.2	40.1	31.4	11.4	754.8
Highest rainfall (mm)	86.2	246.5	67.4	114	226.9	250.8	248.9	170.7	145.2	108	93.2	59	1022.2
Lowest rainfall (mm)	0	0	0	2.7	34.7	28.4	39.4	42.8	33.6	7.9	5	0	487.1



Created on Thu, 1 Oct 2015 18:07 PM EST

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 Lot 123 Mortimer Rd.
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 WA
 Mr. I. Yujnovick



Sources: Bureau of Meteorology
<http://www.bom.gov.au/>
 Accessed: September 2015



Table 2 – Monthly Climate Statistics for Jandakot Airport

Table 3 - The two systems are summarised in the table below.

Trudgen	Description	Keighery	Description
Excellent	The vegetation is pristine or nearly so, with no obvious signs of damage caused by the activities of European man.	Pristine	Pristine or nearly so, no obvious signs of disturbance.
Very Good	Some relatively slight signs of damage caused by the activities of European man. E.g. some signs of damage to tree trunks caused by repeated fire and the presence of some relatively non-aggressive weeds such as <i>Ursinia anthemoides</i> or <i>Briza</i> sp. or occasional vehicle tracks.	Excellent	Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive.
Good	More obvious signs of damage caused by the activities of European man, including some obvious impact on the vegetation structure such as caused by low levels of grazing or by selective logging. Weeds as above, possibly some more aggressive ones.	Very Good	Vegetation structure altered, obvious signs of disturbance. For example, disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and grazing.
Poor	Still retains basic vegetation structure or ability to regenerate it after very obvious impacts of activities of European man such as grazing or partial clearing (chaining) or very frequent fires. Weeds as above plus some more aggressive ones such as <i>Ehrharta</i> spp.	Good	Vegetation structure significantly altered by very obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it. For example, disturbance to vegetation structure caused by very frequent fires, the presence of some very aggressive weeds at high density, partial clearing, dieback and grazing.
Very Poor	Severely impacted by grazing, fire clearing or a combination of these activities. Scope for some regeneration but, not to a state approaching good condition without intensive management. Usually a number of weed species including aggressive species.	Degraded	Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. For example, disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds at high density, partial clearing, dieback and grazing.
Completely degraded	Areas that are completely or almost completely without native species in the structure of their vegetation. I.e. areas that are cleared or "parkland cleared" with their flora comprising weed or crop species with isolated native trees or shrubs.	Completely degraded	The structure of the vegetation is no longer intact and the area is completely or almost completely without native species. These areas are often described as 'parkland cleared' with the flora comprising weed or crop species with isolated native trees or shrubs.

Appendix 1- 2008 Survey Results

Family	Species	Site						
		Q1	Q2	Q3	Q4	Q5	Q6	T1
Anthericaceae	<i>Chamaescilla corymbosa</i> var. <i>corymbosa</i>		+		+	+		
Anthericaceae	<i>Laxmannia squarrosa</i>		OQ				+	
Anthericaceae	<i>Sowerbaea laxiflora</i>		+				+	
Anthericaceae	<i>Thysanotus patersonii</i>		OQ					
Anthericaceae	<i>Thysanotus sparteus</i>				OQ			
Apiaceae	<i>Trachymene pilosa</i>	+	+		+			
Asteraceae	<i>Hypochaeris glabra</i>						+	
Asteraceae	<i>Lagenophora huegelii</i>						+	
Asteraceae	<i>Podolepis gracilis</i>		+			+	2%	
Asteraceae	<i>Podotheca chrysantha</i>						+	
Asteraceae	<i>Rhodanthe floribunda</i>	OQ			+			
Asteraceae	<i>Ursinia anthemoides</i>		+				+	
Casuarinaceae	<i>Allocasuarina fraseriana</i>			5%				
Casuarinaceae	<i>Allocasuarina humilis</i>						OQ	
Colchicaceae	<i>Burchardia congesta</i>		+			+	+	
Crassulaceae	<i>Crassula colorata</i> var. <i>colorata</i>	OQ						
Cyperaceae	<i>Lepidosperma squamatum</i>					+		
Cyperaceae	<i>Mesomelaena pseudostygia</i>		5%				+	
Cyperaceae	<i>Mesomelaena tetragona</i>				OQ			
Cyperaceae	<i>Schoenus curvifolius</i>				OQ			
Dasyopogonaceae	<i>Calectasia narragara</i>						OQ	
Dasyopogonaceae	<i>Dasyopogon bromeliifolius</i>	+		+	+	+		
Dasyopogonaceae	<i>Lomandra hermaphrodita</i>		+					
Dasyopogonaceae	<i>Lomandra sericea</i>					+		
Dilleniaceae	<i>Hibbertia hypericoides</i>		5%				1%	
Dilleniaceae	<i>Hibbertia racemosa</i>		5%	OQ		+	+	
Dilleniaceae	<i>Hibbertia vaginata</i>	+			+			
Droseraceae	<i>Drosera erythrorhiza</i> subsp. <i>erythrorhiza</i>		+			+	+	
Droseraceae	<i>Drosera menziesii</i> subsp. <i>penicillaris</i>		+			+		
Droseraceae	<i>Drosera porrecta</i>		+				2%	
Epacridaceae	<i>Conostephium pendulum</i>		1%				10%	
Epacridaceae	<i>Leucopogon australis</i>			1%				
Epacridaceae	<i>Leucopogon conostephioides</i>			+		5%	40%	
Epacridaceae	<i>Lysinema ciliatum</i>				OQ		OQ	
Euphorbiaceae	<i>Monotaxis occidentalis</i>			+				
Goodeniaceae	<i>Dampiera linearis</i>			+		+	+	+
Goodeniaceae	<i>Goodenia pulchella</i> subsp. <i>Coastal Plain</i>				OQ			
Goodeniaceae	<i>Lechenaultia floribunda</i>			OQ				
Haemodoraceae	<i>Anigozanthos humilis</i> subsp. <i>humilis</i>						OQ	
Haemodoraceae	<i>Conostylis aculeata</i> subsp. <i>aculeata</i>		1%			2%	+	+
Haemodoraceae	<i>Conostylis juncea</i>				+			
Haemodoraceae	<i>Conostylis setigera</i> subsp. <i>setigera</i>						OQ	
Haemodoraceae	<i>Phlebocarya ciliata</i>	4%	+	+	35%			
Iridaceae	<i>Patersonia occidentalis</i> var. <i>occidentalis</i>				OQ	+		
Lamiaceae	<i>Hemiandra pungens</i>					+	OQ	
Lauraceae	<i>Cassytha</i> sp.			1%				
Lobeliaceae	<i>Lobelia tenuior</i>						OQ	
Loganiaceae	<i>Phyllangium paradoxum</i>	+						
Mimosaceae	<i>Acacia applanata</i>		+			+		
Mimosaceae	<i>Acacia huegelii</i>					+	OQ	
Mimosaceae	<i>Acacia insolita</i> subsp. <i>insolita</i>			+				
Myrtaceae	<i>Astartea affinis</i>			+				

Myrtaceae	Astartea sp. Gingalup (N. Gibson & M. Lyons 119)	30%		+				
Myrtaceae	Calytrix angulata			+				+
Myrtaceae	Calytrix flavescens							+
Myrtaceae	Calytrix fraseri					OQ		
Myrtaceae	Corymbia calophylla			+		4%		
Myrtaceae	Eremaea asterocarpa subsp. asterocarpa		1%					OQ
Myrtaceae	Eremaea pauciflora					OQ		
Myrtaceae	Eucalyptus marginata							30%
Myrtaceae	Hypocalymma angustifolium		15%		8%	+		
Myrtaceae	Hypocalymma robustum						+	
Myrtaceae	Kunzea glabrescens							+
Myrtaceae	Melaleuca preissiana		1%					
Myrtaceae	Melaleuca raphiophylla				20%			
Myrtaceae	Pericalymma ellipticum var. floridum		25%			35%		
Myrtaceae	Scholtzia involucrata					+		
Orchidaceae	Caladenia discoidea					+		
Orchidaceae	Caladenia flava							+
Orchidaceae	Caladenia flava subsp. flava			+		+		
Orchidaceae	Diuris magnifica							+
Orchidaceae	Elythranthera brunonis			+				
Orchidaceae	Pterostylis sanguinea					+		
Orchidaceae	Pyrorchis nigricans			+			+	
Orchidaceae	Thelymitra sp.					OQ		
Papilionaceae	Aotus gracillima					1%		
Papilionaceae	Bossiaea eriocarpa			1%			5%	+
Papilionaceae	Daviesia incrassata subsp. incrassata							OQ
Papilionaceae	Euchilopsis linearis		30%			3%		
Papilionaceae	Gompholobium tomentosum					+	+	
Papilionaceae	Hovea trisperma var. trisperma							OQ
Papilionaceae	Isotropis cuneifolia subsp. cuneifolia							+
Papilionaceae	Jacksonia furcellata					+		
Papilionaceae	Jacksonia sericea					+		
Papilionaceae	Jacksonia sternbergiana							OQ
Poaceae	Amphipogon turbinatus			40%		OQ		
Poaceae	Ehrharta calycina							+
Poaceae	Thyridolepis multiculmis					+		
Proteaceae	Adenanthos obovatus						OQ	+
Proteaceae	Banksia attenuata			15%	+		25%	2%
Proteaceae	Banksia ilicifolia						5%	+
Proteaceae	Banksia menziesii			20%			5%	10%
Proteaceae	Conospermum capitatum subsp. glabratum					2%		
Proteaceae	Persoonia saccata							3%
Proteaceae	Petrophile linearis			1%			+	+
Proteaceae	Stirlingia latifolia						1%	
Proteaceae	Synaphea spinulosa subsp. spinulosa							OQ
Restionaceae	Desmocladius flexuosus			+			5%	+
Restionaceae	Dielsia stenostachya					40%		
Restionaceae	Hypolaena exsulca		+		5%	+		+
Restionaceae	Lyginia imberbis		+	+		OQ	+	
Rutaceae	Boronia crenulata subsp. viminea						1%	
Rutaceae	Philotheca spicata					OQ	+	+
Santalaceae	Leptomeria pauciflora		5%					
Stylidiaceae	Stylidium aff. androsaceum					+		
Stylidiaceae	Stylidium guttatum					+		
Stylidiaceae	Stylidium piliferum		OQ	OQ			+	

Stylidiaceae	Stylidium repens	+	+		+	+		
Stylidiaceae	Stylidium scariosum			+				
Stylidiaceae	Stylidium schoenoides		+			+		
Thymelaeaceae	Pimelea rosea subsp. rosea						OQ	
Xanthorrhoeaceae	Xanthorrhoea preissii	1%		5%	4%			
Zamiaceae	Macrozamia riedlei					2%		

Appendix 2 -2015 Survey Results

Species	Family	Weed	Transect
			24-09-15
Acacia applanata	Mimosaceae		✓
Acacia huegelii	Mimosaceae		
Acacia insolita subsp. insolita	Mimosaceae		
Adenanthos obovatus	Proteaceae		✓
Allocasuarina fraseriana	Casuarinaceae		✓
Allocasuarina humilis	Casuarinaceae		✓
Amphipogon turbinatus	Poaceae		
Anigozanthos humilis subsp. humilis	Haemodoraceae		✓
Aotus gracillima	Papilionaceae		✓
Astartea affinis	Myrtaceae		
Astartea sp. Gingalup	Myrtaceae		✓
Banksia attenuata	Proteaceae		✓
Banksia ilicifolia	Proteaceae		✓
Banksia menziesii	Proteaceae		✓
Boronia crenulata subsp. viminea	Rutaceae		✓
Briza sp.	Poaceae	*	✓
Bossiaea eriocarpa	Papilionaceae		✓
Burchardia congesta	Colchicaceae		✓
Caladenia discoidea	Orchidaceae		
Caladenia flava	Orchidaceae		✓
Caladenia flava subsp. flava	Orchidaceae		
Calectasia grandiflora	Dasygogonaceae		✓
Calytrix angulata	Myrtaceae		
Calytrix flavescens	Myrtaceae		✓
Calytrix fraseri	Myrtaceae		✓
Cassytha sp.	Lauraceae		
Chamaescilla corymbosa var. corymbosa	Anthericaceae		✓
Conospermum capitatum subsp. glabratum	Proteaceae		
Conostephium pendulum	Epacridaceae		✓
Conostylis aculeata subsp. aculeata	Haemodoraceae		
Conostylis juncea	Haemodoraceae		✓
Conostylis setigera subsp. setigera	Haemodoraceae		✓
Corymbia calophylla	Myrtaceae		✓
Crassula colorata var. colorata	Crassulaceae		
Dampiera linearis	Goodeniaceae		✓
Dasygogon bromeliifolius	Dasygogonaceae		✓
Daviesia incrassata subsp. incrassata	Papilionaceae		✓
Desmocladus flexuosus	Restionaceae		
Dielsia stenostachya	Restionaceae		
Diuris magnifica	Orchidaceae		
Drosera erythrorhiza subsp. erythrorhiza	Droseraceae		✓
Drosera menziesii subsp. penicillaris	Droseraceae		✓
Drosera porrecta	Droseraceae		✓
Ehrharta calycina	Poaceae	*	
Elythranthera brunonis	Orchidaceae		✓
Eremaea asterocarpa subsp. asterocarpa	Myrtaceae		
Eremaea pauciflora	Myrtaceae		✓
Eucalyptus marginata	Myrtaceae		✓
Euchilopsis linearis	Papilionaceae		
Gompholobium tomentosum	Papilionaceae		✓
Goodenia pulchella subsp. Coastal Plain A	Goodeniaceae		
Hemiandra pungens	Lamiaceae		✓

<i>Hibbertia hypericoides</i>	Dilleniaceae		✓
<i>Hibbertia racemosa</i>	Dilleniaceae		✓
<i>Hibbertia vaginata</i>	Dilleniaceae		✓
<i>Hovea trisperma</i> var. <i>trisperma</i>	Papilionaceae		
<i>Hypocalymma angustifolium</i>	Myrtaceae		✓
<i>Hypocalymma robustum</i>	Myrtaceae		✓
<i>Hypochoeris glabra</i>	Asteraceae	*	
<i>Hypolaena exsulca</i>	Restionaceae		
<i>Isotropis cuneifolia</i> subsp. <i>cuneifolia</i>	Papilionaceae		✓
<i>Jacksonia furcellata</i>	Papilionaceae		✓
<i>Jacksonia sericea</i>	Papilionaceae		✓
<i>Jacksonia sternbergiana</i>	Papilionaceae		✓
<i>Kunzea glabrescens</i>	Myrtaceae		✓
<i>Lagenophora huegelii</i>	Asteraceae		
<i>Laxmannia squarrosa</i>	Anthericaceae		✓
<i>Lechenaultia floribunda</i>	Goodeniaceae		
<i>Lepidosperma squamatum</i>	Cyperaceae		
<i>Leptomeria pauciflora</i>	Santalaceae		
<i>Leucopogon australis</i>	Epacridaceae		✓
<i>Leucopogon conostephioides</i>	Epacridaceae		✓
<i>Lobelia tenuior</i>	Lobeliaceae		✓
<i>Lomandra hermaphrodita</i>	Dasygogonaceae		✓
<i>Lomandra sericea</i>	Dasygogonaceae		?
<i>Lyginia imberbis</i>	Restionaceae		
<i>Lysinema ciliatum</i>	Epacridaceae		
<i>Macrozamia riedlei</i>	Zamiaceae		✓
<i>Melaleuca preissiana</i>	Myrtaceae		✓
<i>Melaleuca raphiophylla</i>	Myrtaceae		✓
<i>Mesomelaena pseudostygia</i>	Cyperaceae		✓
<i>Mesomelaena tetragona</i>	Cyperaceae		✓
<i>Monotaxis occidentalis</i>	Euphorbiaceae		
<i>Patersonia occidentalis</i> var. <i>occidentalis</i>	Iridaceae		✓
<i>Pericalymma ellipticum</i> var. <i>floridum</i>	Myrtaceae		
<i>Persoonia saccata</i>	Proteaceae		✓
<i>Petrophile linearis</i>	Proteaceae		✓
<i>Philothea spicata</i>	Rutaceae		✓
<i>Phlebocarya ciliata</i>	Haemodoraceae		
<i>Phyllangium paradoxum</i>	Loganiaceae		
<i>Pimelea rosea</i> subsp. <i>rosea</i>	Thymelaeaceae		✓
<i>Podolepis gracilis</i>	Asteraceae		
<i>Podotrochea chrysantha</i>	Asteraceae		
<i>Pterostylis sanguinea</i>	Orchidaceae		?
<i>Pyrorchis nigricans</i>	Orchidaceae		
<i>Rhodanthe floribunda</i>	Asteraceae		✓
<i>Schoenus curvifolius</i>	Cyperaceae		
<i>Scholtzia involuocrata</i>	Myrtaceae		?
<i>Sowerbaea laxiflora</i>	Anthericaceae		✓
<i>Stirlingia latifolia</i>	Proteaceae		✓
<i>Stylidium</i> aff. <i>androsaceum</i>	Stylidiaceae		
<i>Stylidium guttatum</i>	Stylidiaceae		
<i>Stylidium piliferum</i>	Stylidiaceae		✓
<i>Stylidium repens</i>	Stylidiaceae		
<i>Stylidium scariosum</i>	Stylidiaceae		
<i>Stylidium schoenoides</i>	Stylidiaceae		✓
<i>Synaphea spinulosa</i> subsp. <i>spinulosa</i>	Proteaceae		✓
<i>Thelymitra</i> sp.	Orchidaceae		

<i>Thyridolepis multiculmis</i>	Poaceae		
<i>Thysanotus patersonii</i>	Anthericaceae		✓
<i>Thysanotus sparteus</i>	Anthericaceae		
<i>Trachymene pilosa</i>	Apiaceae		✓
<i>Ursinia anthemoides</i>	Asteraceae	*	
<i>Xanthorrhoea preissii</i>	Xanthorrhoeaceae		✓
Additional Species			
<i>Eucalyptus gomphocephala</i>	Myrtaceae		✓
<i>Banksia nivea</i>	Proteaceae		✓
<i>Carpobrotus virescens</i>	Aizoaceae		✓
<i>Isopogon linearis</i>	Proteaceae		✓
<i>Ptilotus manglesii</i>	Amaranthaceae		✓
<i>Xylomelum occidentale</i>	Proteaceae		✓
<i>Chamelaucium micranthum</i>	Myrtaceae		✓
<i>Nuytsia floribunda</i>	Loranthaceae		✓
<i>Synaphea spinulosa</i>	Proteaceae		✓
<i>Macarthuria australis</i>	Molluginaceae		✓
<i>Isotropis cuneifolia</i>	Fabaceae		✓
<i>Tricoryne tenella</i>	Hemerocallidaceae		✓
<i>Podolepis gardneri</i>	Asteraceae		✓
<i>Lysinema ciliatum</i>	Ericaceae		✓
<i>Hybanthus calycinus</i>	Thymelaeaceae		✓
<i>Burchardia bairdiae</i>	Colchicaceae		✓
<i>Lomandra suaveolens</i>	Asparagaceae		✓
<i>Zantedeschia aethiopica</i>	Araceae	*	✓
<i>Watsonia meriana</i>	Iridaceae	*	✓

Appendix 3: Scoring method used for assessing Black Cockatoo foraging habitat value (Majority of Property)

Site Characteristics	Criteria	Score
Site Condition	1. Vegetation condition of foraging species (dead vegetation - drought, fire, dieback, clearing). Score 0-3.	3
	2. Diversity of foraging species present. Score 0-3.	3
	3. Types of foraging species present (low, medium or high priority species based on Birdlife Australia foraging species list for Black Cockatoo). Score 0-3.	3
Species Stocking Rate	4. Density of foraging species (plants/hectare) calculated based on mean distance between plants. Score 0-3.	3
	5. Evidence of species usage of the habitat (current, recent, old, historical). Score 0-3.	2
	6. Extent of species usage of habitat. Score 0-3.	2
Site Context	7. Proximity to other (off-site) foraging habitat. Score 0-3.	1
Total score (0-21). 0-5 = low, 6-10 = moderate, 11 - 15 = good, 16 - 21 = excellent		17

Appendix 4: Referral guidelines

High risk of significant impacts: referral recommended
<ul style="list-style-type: none">• Clearing of any known nesting tree (see glossary).• Clearing or degradation of any part of a vegetation community known to contain breeding habitat (see Section 3).• Clearing of more than 1 ha of quality¹ foraging habitat² (see Table 1).• Clearing or degradation (including pruning the top canopy) of a known night roosting site (see glossary).• Creating a gap of greater than 4 km between patches of black cockatoo habitat (breeding, foraging or roosting).
Uncertainty: referral recommended or contact the department
<ul style="list-style-type: none">• Degradation (such as through altered hydrology or fire regimes) of more than 1 ha of foraging habitat⁷. Significance will depend on the level and extent of degradation and the quality of the habitat.• Clearing or disturbance in areas surrounding black cockatoo breeding, foraging or night roosting habitat that has the potential to degrade habitat through introduction of invasive species, edge effects, hydrological changes, increased human visitation or fire.• Actions that do not directly affect the listed species but that have the potential for indirect impacts such as increasing competitors for nest hollows.• Actions with the potential to introduce known plant diseases such as <i>Phytophthora</i> spp. to an area where the pathogen was not previously known.
Low risk of significant impacts: referral may not be required
<ul style="list-style-type: none">• Actions that do not affect black cockatoo habitat or individuals.• Actions whose impacts occur outside the modeled distribution of the three black cockatoos.

¹ Quality should be assessed as it pertains specifically to black cockatoo use of the habitat. For example, the condition of the understorey is a standard component of most ecological habitat quality surveys but is of limited relevance to considerations for some black cockatoos, particularly in relation to breeding habitat which may consist of mature woodland canopy with little or no understorey.

² Maintaining the availability of foraging habitat is especially important in the breeding range, as sufficient foraging habitat within a 6–12 km radius of breeding sites is necessary to successfully raise chicks. Maintaining foraging habitat is also particularly important in the Perth metropolitan area, due to the role of these feeding areas in the survival of young birds and the maintenance of the population between breeding seasons, coupled with the lack of habitat remaining in this region and its connectivity values.

Appendix 5 – Tree Survey results

Species	Diameter (cm)	Hollows	Longitude (UTM)	Latitude (UTM)
Marri	86	Hollows Forming	392707	6431423
Marri	65	Hollows Forming	392727	6431362
Marri	76	Hollows Forming	392740	6431328
Jarrah	87	Hollows Forming	392766	6431578
Jarrah	80	Hollows Forming	392828	6431306
Marri	72	Hollows Forming	392841	6431758
Jarrah	74	Hollows Forming	392845	6431515
Marri	67	Hollows Forming	392869	6431747
Marri	88	Hollows Forming	392877	6431450
Jarrah	72	Hollows present	392877	6431298
Jarrah	98	Hollows present	392884	6431722
Marri	66	Hollows Forming	392890	6431459
Jarrah	68	Hollows Forming	392915	6431543
Marri	89	Hollows Forming	392917	6431630
Tuart	67	Hollows Forming	392948	6431713
Marri	86	Hollows Forming	392949	6431675
Jarrah	92	Hollows Forming	392977	6431265
Marri	102	Hollows present	392987	6431728
Marri	120	Hollows present	392988	6431238
Marri	112	Hollows present	392997	6431267
Jarrah	85	Hollows Forming	393007	6431243
Jarrah	72	Hollows Forming	393018	6430920
Jarrah	97	Hollows Forming	393020	6431262
Jarrah	90	Hollows Forming	393020	6430922
Jarrah	62	Hollows Forming	393020	6431262
Jarrah	72	Hollows Forming	393020	6430922
Jarrah	82	Hollows Forming	393021	6430919
Jarrah	96	Hollows present	393029	6431727
Jarrah	120	Hollows Forming	393031	6431779
Jarrah	92	Hollows present	398328	6441760
Marri	82	Hollows present	398328	6441766
Marri	77	Hollows Forming	405785	6432920
Jarrah	64	Hollows Forming	405831	6432964

Appendix 6 NatureMap Species Report

Created By Guest user on 22/09/2015

Current Names Only Yes
Core Datasets Only Yes
Method 'By Circle'
Centre 115°51' 43" E, 32°15' 02" S
Buffer 5km
Group By Conservation Status

Conservation Status	Species	Records
Non-conservation taxon	541	3577
Priority 1	1	1
Priority 3	6	14
Priority 4	6	27
Priority 5	2	184
Protected under international agreement	8	49
Rare or likely to become extinct	7	34
TOTAL	571	3886

Name ID	Species Name	Naturalised	Conservation Code	Endemic To Query Area
Rare or likely to become extinct				
1.	1596 <i>Caladenia huegelii</i> (Grand Spider Orchid)		T	
2.	24784 <i>Calidris ferruginea</i> (Curlew Sandpiper)		T	
3.	24731 <i>Calyptorhynchus banksii</i> subsp. <i>naso</i> (Forest Red-tailed Black-Cockatoo)		T	
4.	24734 <i>Calyptorhynchus latirostris</i> (Carnaby's Cockatoo (short-billed black-cockatoo), Carnaby's Cockatoo)		T	
5.	24092 <i>Dasyurus geoffroii</i> (Chuditch, Western Quoll)		T	
6.	12938 <i>Diuris micrantha</i>		T	
7.	1639 <i>Drakaea elastica</i> (Glossy-leaved Hammer Orchid)		T	
Protected under international agreement				
8.	41323 <i>Actitis hypoleucos</i> (Common Sandpiper)		IA	
9.	41324 <i>Ardea modesta</i> (Eastern Great Egret)		IA	
10.	24786 <i>Calidris melanotos</i> (Pectoral Sandpiper)		IA	
11.	24788 <i>Calidris ruficollis</i> (Red-necked Stint)		IA	
12.	24293 <i>Haliaeetus leucogaster</i> (White-bellied Sea-Eagle)		IA	
13.	24598 <i>Merops ornatus</i> (Rainbow Bee-eater)		IA	
14.	24806 <i>Tringa glareola</i> (Wood Sandpiper)		IA	
15.	24808 <i>Tringa nebularia</i> (Common Greenshank)		IA	
Priority 1				
16.	16633 <i>Boronia juncea</i> subsp. <i>juncea</i>		P1	
Priority 3				
17.	16245 <i>Cyathochaeta teretifolia</i>		P3	
18.	20462 <i>Jacksonia gracillima</i>		P3	
19.	25147 <i>Lerista lineata</i> (Perth Slider, Lined Skink)		P3	
20.	25249 <i>Neelaps calonotos</i> (Black-striped Snake)		P3	
21.	7756 <i>Stylidium longitubum</i> (Jumping Jacks)		P3	
22.	25800 <i>Stylidium paludicola</i>		P3	
Priority 4				
23.	141 <i>Aponogeton hexatepalus</i> (Stalked Water Ribbons)		P4	
24.	4763 <i>Dodonaea hackettiana</i> (Hackett's Hopbush)		P4	
25.	24133 <i>Macropus irma</i> (Western Brush Wallaby)		P4	
26.	24328 <i>Oxyura australis</i> (Blue-billed Duck)		P4	
27.	17850 <i>Stylidium ireneae</i>		P4	
28.	33992 <i>Synemon gratiosa</i> (Graceful Sunmoth)		P4	
Priority 5				
29.	25478 <i>Isoodon obesulus</i> (Southern Brown Bandicoot)		P5	
30.	24153 <i>Isoodon obesulus</i> subsp. <i>fusciventer</i> (Quenda, Southern Brown Bandicoot)		P5	
Non-conservation taxon				
31.	15466 <i>Acacia applanata</i>			

Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
32.	3374 <i>Acacia huegelii</i>			
33.	3557 <i>Acacia stenoptera</i> (Narrow Winged Wattle)			
34.	3602 <i>Acacia willdenowiana</i> (Grass Wattle)			
35.	24260 <i>Acanthiza apicalis</i> (Broad-tailed Thornbill, Inland Thornbill)			
36.	24261 <i>Acanthiza chrysorrhoa</i> (Yellow-rumped Thornbill)			
37.	24262 <i>Acanthiza inornata</i> (Western Thornbill)			
38.	24560 <i>Acanthorhynchus superciliosus</i> (Western Spinebill)			
39.	25535 <i>Accipiter cirrocephalus</i> (Collared Sparrowhawk)			
40.	24281 <i>Accipiter cirrocephalus</i> subsp. <i>cirrocephalus</i> (Collared Sparrowhawk)			
41.	25536 <i>Accipiter fasciatus</i> (Brown Goshawk)			
42.	24282 <i>Accipiter fasciatus</i> subsp. <i>fasciatus</i> (Brown Goshawk)			
43.	42368 <i>Acritoscincus trilineatus</i> (Western Three-lined Skink)			
44.	25755 <i>Acrocephalus australis</i> (Australian Reed Warbler)			
45.	6203 <i>Actinotus glomeratus</i>			
46.	1775 <i>Adenanthos cygnorum</i> (Common Woollybush)			
47.	11837 <i>Adenanthos cygnorum</i> subsp. <i>cygnorum</i> (Common Woollybush)			
48.	1791 <i>Adenanthos obovatus</i> (Basket Flower)			
49.	<i>Afraflacilla huntorum</i>			Y
50.	1261 <i>Agrostocrinum scabrum</i> (Blue Grass Lily)			
51.	184 <i>Aira caryophyllea</i> (Silvery Hairgrass)	Y		
52.	187 <i>Aira praecox</i> (Early Hairgrass)	Y		
53.	1728 <i>Allocauarina fraseriana</i> (Sheoak, Kondil)			
54.	4585 <i>Amperea ericoides</i>			
55.	20184 <i>Amphipogon laguroides</i> subsp. <i>laguroides</i>			
56.	200 <i>Amphipogon turbinatus</i>			
57.	<i>Aname mainae</i>			
58.	24312 <i>Anas gracilis</i> (Grey Teal)			
59.	24315 <i>Anas rhynchotis</i> (Australasian Shoveler)			
60.	24316 <i>Anas superciliosa</i> (Pacific Black Duck)			
61.	11434 <i>Anigozanthos humilis</i> subsp. <i>humilis</i>			
62.	11261 <i>Anigozanthos manglesii</i> subsp. <i>manglesii</i>			
63.	1416 <i>Anigozanthos viridis</i> (Green Kangaroo Paw, Kurulbardang)			
64.	24561 <i>Anthochaera carunculata</i> (Red Wattlebird)			
65.	24562 <i>Anthochaera lunulata</i> (Western Little Wattlebird)			
66.	<i>Antichiropus variabilis</i>			
67.	3686 <i>Aotus cordifolia</i>			
68.	3688 <i>Aotus gracillima</i>			
69.	3692 <i>Aotus procumbens</i>			
70.	1117 <i>Aphelia cyperoides</i>			
71.	24991 <i>Aprasia repens</i> (Sand-plain Worm-lizard)			
72.	24285 <i>Aquila audax</i> (Wedge-tailed Eagle)			
73.	<i>Araneus cyphoxis</i>			
74.	<i>Araneus senicaudatus</i>			
75.	38964 <i>Arcyria cinerea</i>			
76.	38967 <i>Arcyria incarnata</i>			
77.	24340 <i>Ardea novaehollandiae</i> (White-faced Heron)			
78.	24341 <i>Ardea pacifica</i> (White-necked Heron)			
79.	<i>Argiope protensa</i>			
80.	1264 <i>Arnocrinum preissii</i>			
81.	25566 <i>Artamus cinereus</i> (Black-faced Woodswallow)			
82.	24353 <i>Artamus cyanopterus</i> (Dusky Woodswallow)			
83.	<i>Artoria flavimana</i>			
84.	<i>Artoria linnaei</i>			
85.	<i>Artoriopsis exposita</i>			
86.	20350 <i>Astartea affinis</i>			
87.	20283 <i>Astartea scoparia</i>			
88.	6323 <i>Astroloma ciliatum</i> (Candle Cranberry)			
89.	6334 <i>Astroloma pallidum</i> (Kick Bush)			
90.	17234 <i>Austrostipa compressa</i>			
91.	234 <i>Avena fatua</i> (Wild Oat)	Y		
92.	24318 <i>Aythya australis</i> (Hardhead)			
93.	18280 <i>Babiana nana</i>	Y		
94.	<i>Backobourkia brounii</i>			
95.	1800 <i>Banksia attenuata</i> (Slender Banksia, Piara)			
96.	1819 <i>Banksia grandis</i> (Bull Banksia, Pulgarla)			
97.	1822 <i>Banksia ilicifolia</i> (Holly-leaved Banksia)			
98.	1834 <i>Banksia menziesii</i> (Firewood Banksia)			
99.	739 <i>Baumea acuta</i> (Pale Twig-rush)			
100.	748 <i>Baumea vaginalis</i> (Sheath Twigrush)			
101.	5382 <i>Beaufortia elegans</i>			

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102.	24319 <i>Biziura lobata</i> (Musk Duck)			
103.	4413 <i>Boronia crenulata</i> (Aniseed Boronia)			
104.	16636 <i>Boronia crenulata</i> subsp. <i>viminea</i>			
105.	4417 <i>Boronia dichotoma</i>			
106.	11381 <i>Boronia ramosa</i> subsp. <i>anethifolia</i>			
107.	1272 <i>Borya scirpoidea</i>			
108.	3710 <i>Bossiaea eriocarpa</i> (Common Brown Pea)			
109.	7878 <i>Brachyscome iberidifolia</i>			
110.	244 <i>Briza maxima</i> (Blowfly Grass)	Y		
111.	245 <i>Briza minor</i> (Shivery Grass)	Y		
112.	249 <i>Bromus diandrus</i> (Great Brome)	Y		
113.	250 <i>Bromus hordeaceus</i> (Soft Brome)	Y		
114.	1366 <i>Bulbine semibarbata</i> (Leek Lily)			
115.	1383 <i>Burchardia bairdiae</i>			
116.	12770 <i>Burchardia congesta</i>			
117.	1385 <i>Burchardia multiflora</i> (Dwarf Burchardia)			
118.	25715 <i>Cacatua roseicapilla</i> (Galah)			
119.	25716 <i>Cacatua sanguinea</i> (Little Corella)			
120.	25598 <i>Cacomantis flabelliformis</i> (Fan-tailed Cuckoo)			
121.	42307 <i>Cacomantis pallidus</i> (Pallid Cuckoo)			
122.	1276 <i>Caesia micrantha</i> (Pale Grass Lily)			
123.	1277 <i>Caesia occidentalis</i>			
124.	1586 <i>Caladenia discoidea</i> (Dancing Orchid)			
125.	1592 <i>Caladenia flava</i> (Cowslip Orchid)			
126.	15348 <i>Caladenia flava</i> subsp. <i>flava</i>			
127.	15361 <i>Caladenia longicauda</i> subsp. <i>calcigena</i>			
128.	17760 <i>Caladenia nobilis</i>			
129.	2854 <i>Calandrinia granulifera</i> (Pygmy Purslane)			
130.	5415 <i>Calothamnus lateralis</i>			
131.	25717 <i>Calyptorhynchus banksii</i> (Red-tailed Black-Cockatoo)			
132.	5458 <i>Calytrix flavescens</i> (Summer Starflower)			
133.	5460 <i>Calytrix fraseri</i> (Pink Summer Calytrix)			
134.	1162 <i>Cartonema phylodroides</i>			
135.	2954 <i>Cassytha micrantha</i>			
136.	2957 <i>Cassytha racemosa</i> (Dodder Laurel)			
137.	11242 <i>Cassytha racemosa</i> forma <i>pilosa</i>			
138.	11799 <i>Cassytha racemosa</i> forma <i>racemosa</i>			
139.	6214 <i>Centella asiatica</i>			
140.	1121 <i>Centrolepis aristata</i> (Pointed Centrolepis)			
141.	1125 <i>Centrolepis drummondiana</i>			
142.	1131 <i>Centrolepis inconspicua</i>			
143.	1132 <i>Centrolepis mutica</i>			
144.	2889 <i>Cerastium glomeratum</i> (Mouse Ear Chickweed)	Y		
145.	<i>Cercophonius sulcatus</i>			
146.	1280 <i>Chamaescilla corymbosa</i> (Blue Squill)			
147.	24377 <i>Charadrius ruficapillus</i> (Red-capped Plover)			
148.	24321 <i>Chenonetta jubata</i> (Australian Wood Duck, Wood Duck)			
149.	763 <i>Chorizandra enodis</i> (Black Bristlerush)			
150.	24980 <i>Christinus marmoratus</i> (Marbled Gecko)			
151.	24431 <i>Chrysococcyx basalis</i> (Horsfield's Bronze Cuckoo)			
152.	24833 <i>Cincloramphus cruralis</i> (Brown Songlark)			
153.	24288 <i>Circus approximans</i> (Swamp Harrier)			
154.	24774 <i>Cladorhynchus leucocephalus</i> (Banded Stilt)			
155.	25675 <i>Colluricincla harmonica</i> (Grey Shrike-thrush)			
156.	24399 <i>Columba livia</i> (Domestic Pigeon)	Y		
157.	4550 <i>Comesperma calymega</i> (Blue-spike Milkwort)			
158.	4564 <i>Comesperma virgatum</i> (Milkwort)			
159.	6348 <i>Conostephium pendulum</i> (Pearl Flower)			
160.	6349 <i>Conostephium preissii</i>			
161.	1418 <i>Conostylis aculeata</i> (Prickly Conostylis)			
162.	11826 <i>Conostylis aculeata</i> subsp. <i>aculeata</i>			
163.	1436 <i>Conostylis juncea</i>			
164.	1455 <i>Conostylis setosa</i> (White Cottonhead)			
165.	7939 <i>Conyza bonariensis</i> (Flaxleaf Fleabane)	Y		
166.	25568 <i>Coracina novaehollandiae</i> (Black-faced Cuckoo-shrike)			
167.	<i>Cormocephalus novaehollandiae</i>			
168.	38776 <i>Cortinarius phalarus</i>			
169.	25592 <i>Corvus coronoides</i> (Australian Raven)			
170.	1285 <i>Corynotheca micrantha</i> (Sand Lily)			
171.	24671 <i>Coturnix pectoralis</i> (Stubble Quail)			

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172.	25595 <i>Cracticus tibicen</i> (Australian Magpie)			
173.	24422 <i>Cracticus tibicen</i> subsp. <i>dorsalis</i> (White-backed Magpie)			
174.	25596 <i>Cracticus torquatus</i> (Grey Butcherbird)			
175.	3137 <i>Crassula colorata</i> (Dense Stonecrop)			
176.	11563 <i>Crassula colorata</i> var. <i>colorata</i>			
177.	30893 <i>Cryptoblepharus buchananii</i>			
178.	30899 <i>Ctenophorus adelaidensis</i> (Southern Heath Dragon, Western Heath Dragon)			
179.	25027 <i>Ctenotus australis</i>			
180.	25039 <i>Ctenotus fallens</i>			
181.	768 <i>Cyathochaeta avenacea</i>			
182.	<i>Cyclosa trilobata</i>			
183.	24322 <i>Cygnus atratus</i> (Black Swan)			
184.	815 <i>Cyperus tenellus</i> (Tiny Flatsedge)	Y		
185.	30901 <i>Dacelo novaeguineae</i> (Laughing Kookaburra)	Y		
186.	38781 <i>Dacryopinax spathularia</i>			
187.	7420 <i>Dampiera alata</i> (Winged-stem Dampiera)			
188.	7454 <i>Dampiera linearis</i> (Common Dampiera)			
189.	25673 <i>Daphoenositta chrysoptera</i> (Varied Sittella)			
190.	1218 <i>Dasyogon bromeliifolius</i> (Pineapple Bush)			
191.	3793 <i>Daviesia angulata</i>			
192.	3832 <i>Daviesia physodes</i>			
193.	25766 <i>Delma fraseri</i> (Fraser's Legless Lizard)			
194.	24999 <i>Delma grayii</i>			
195.	38785 <i>Descomyces angustisporus</i>			
196.	16595 <i>Desmocladius flexuosus</i>			
197.	299 <i>Deyeuxia quadriseta</i> (Reed Bentgrass)			
198.	1259 <i>Dianella revoluta</i> (Blueberry Lily)			
199.	11636 <i>Dianella revoluta</i> var. <i>divaricata</i>			
200.	25607 <i>Dicaeum hirundinaceum</i> (Mistletoebird)			
201.	306 <i>Dichelachne crinita</i> (Longhair Plumegrass)			
202.	1287 <i>Dichopogon capillipes</i>			
203.	17838 <i>Dielsia stenostachya</i>			
204.	7054 <i>Dischisma arenarium</i>	Y		
205.	7055 <i>Dischisma capitatum</i> (Woolly-headed Dischisma)	Y		
206.	11049 <i>Diuris corymbosa</i>			
207.	12939 <i>Diuris magnifica</i>			
208.	3092 <i>Drosera bulbosa</i> (Red-leaved Sundew)			
209.	3095 <i>Drosera erythrorhiza</i> (Red Ink Sundew)			
210.	3097 <i>Drosera gigantea</i> (Giant Sundew)			
211.	16244 <i>Drosera gigantea</i> subsp. <i>geniculata</i>			
212.	3098 <i>Drosera glanduligera</i> (Pimpernel Sundew)			
213.	3101 <i>Drosera heterophylla</i> (Swamp Rainbow)			
214.	3106 <i>Drosera macrantha</i> (Bridal Rainbow)			
215.	3109 <i>Drosera menziesii</i> (Pink Rainbow)			
216.	11853 <i>Drosera menziesii</i> subsp. <i>menziesii</i>			
217.	13216 <i>Drosera menziesii</i> subsp. <i>penicillaris</i>			
218.	13189 <i>Drosera oreopodium</i>			
219.	13188 <i>Drosera paleacea</i> subsp. <i>paleacea</i>			
220.	3124 <i>Drosera pulchella</i> (Pretty Sundew)			
221.	3131 <i>Drosera stolonifera</i> (Leafy Sundew)			
222.	11485 <i>Ehrharta brevifolia</i> var. <i>cuspidata</i>	Y		
223.	347 <i>Ehrharta calycina</i> (Perennial Veldt Grass)	Y		
224.	1643 <i>Elythranthera brunonis</i> (Purple Enamel Orchid)			
225.	11756 <i>Epilobium billardioreanum</i> subsp. <i>cinereum</i> (Variable Willow Herb)			
226.	6132 <i>Epilobium ciliatum</i>	Y		
227.	379 <i>Eragrostis elongata</i> (Clustered Lovegrass)			
228.	13950 <i>Eremaea asterocarpa</i> subsp. <i>asterocarpa</i>			
229.	<i>Eriophora biapicata</i>			
230.	15446 <i>Eryngium pinnatifidum</i> subsp. <i>pinnatifidum</i>			
231.	5708 <i>Eucalyptus marginata</i> (Jarrah, Djara)			
232.	5763 <i>Eucalyptus rudis</i> (Flooded Gum, Kulurda)			
233.	3872 <i>Euchilopsis linearis</i> (Swamp Pea)			
234.	3880 <i>Eutaxia virgata</i>			
235.	835 <i>Evandra pauciflora</i>			
236.	25622 <i>Falco cenchroides</i> (Australian Kestrel)			
237.	24472 <i>Falco cenchroides</i> subsp. <i>cenchroides</i> (Australian Kestrel)			
238.	25623 <i>Falco longipennis</i> (Australian Hobby)			
239.	24041 <i>Felis catus</i> (Cat)	Y		
240.	25727 <i>Fulica atra</i> (Eurasian Coot)			
241.	24761 <i>Fulica atra</i> subsp. <i>australis</i> (Eurasian Coot)			

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242.	25729 <i>Gallinula tenebrosa</i> (Dusky Moorhen)			
243.	24764 <i>Gallinula ventralis</i> (Black-tailed Native-hen)			
244.	20473 <i>Gastrolobium ebracteolatum</i>			
245.	25530 <i>Gerygone fusca</i> (Western Gerygone)			
246.	1520 <i>Gladiolus caryophyllaceus</i> (Wild Gladiolus)	Y		
247.	3951 <i>Gompholobium marginatum</i>			
248.	3957 <i>Gompholobium tomentosum</i> (Hairy Yellow Pea)			
249.	6161 <i>Gonocarpus pithyoides</i>			
250.	7538 <i>Goodenia pulchella</i>			
251.	24443 <i>Grallina cyanoleuca</i> (Magpie-lark)			
252.	37500 <i>Grammatotheca bergiana</i> var. <i>bergiana</i>	Y		
253.	2066 <i>Grevillea pilulifera</i> (Woolly-flowered Grevillea)			
254.	2788 <i>Gyrostemon subnudus</i>			
255.	1468 <i>Haemodorum laxum</i>			
256.	1474 <i>Haemodorum sparsiflorum</i>			
257.	1475 <i>Haemodorum spicatum</i> (Mardja)			
258.	2179 <i>Hakea marginata</i>			
259.	2197 <i>Hakea prostrata</i> (Harsh Hakea)			
260.	2216 <i>Hakea varia</i> (Variable-leaved Hakea)			
261.	25541 <i>Haliastur indus</i> (Brahminy Kite)			
262.	24295 <i>Haliastur spheurus</i> (Whistling Kite)			
263.	24296 <i>Hamirostra isura</i> (Square-tailed Kite)			
264.	3961 <i>Hardenbergia comptoniana</i> (Native Wisteria)			
265.	25410 <i>Heleioporus eyrei</i> (Moaning Frog)			
266.	3016 <i>Heliophila pusilla</i>	Y		
267.	6839 <i>Hemiandra pungens</i> (Snakebush)			
268.	25119 <i>Hemiergis quadrilineata</i>			
269.	1293 <i>Hensmania turbinata</i>			
270.	5114 <i>Hibbertia commutata</i>			
271.	5135 <i>Hibbertia hypericoides</i> (Yellow Buttercups)			
272.	5154 <i>Hibbertia perfoliata</i>			
273.	5162 <i>Hibbertia racemosa</i> (Stalked Guinea Flower)			
274.	5173 <i>Hibbertia subvaginata</i>			
275.	5176 <i>Hibbertia vaginata</i>			
276.	25734 <i>Himantopus himantopus</i> (Black-winged Stilt)			
277.	24491 <i>Hirundo neoxena</i> (Welcome Swallow)			
278.	<i>Holasteron perth</i>			
279.	<i>Holconia westralia</i>			
280.	445 <i>Holcus setiger</i> (Annual Fog)	Y		
281.	<i>Holoplatys dejongi</i>			
282.	6222 <i>Homalosciadium homalocarpum</i>			
283.	3968 <i>Hovea trisperma</i> (Common Hovea)			
284.	12859 <i>Hovea trisperma</i> var. <i>trisperma</i>			
285.	6224 <i>Hydrocotyle blepharocarpa</i>			
286.	6240 <i>Hydrocotyle scutellifera</i>			
287.	5817 <i>Hypocalymma angustifolium</i> (White Myrtle, Kudjid)			
288.	35070 <i>Hypocalymma angustifolium</i> subsp. <i>Swan Coastal Plain</i> (G.J. Keighery 16777)			
289.	5825 <i>Hypocalymma robustum</i> (Swan River Myrtle)			
290.	8086 <i>Hypochoeris glabra</i> (Smooth Catsear)	Y		
291.	1070 <i>Hypolaena exsulca</i>			
292.	<i>Idiommatia blackwalli</i>			
293.	<i>Idiosoma sigillatum</i>			
294.	40870 <i>Inocybe rufuloides</i>	Y		
295.	910 <i>Isolepis cernua</i> (Nodding Club-rush)			
296.	912 <i>Isolepis cyperoides</i>			
297.	917 <i>Isolepis marginata</i> (Coarse Club-rush)			
298.	919 <i>Isolepis oldfieldiana</i>			
299.	924 <i>Isolepis stellata</i> (Star Club-rush)			
300.	<i>Isopeda leishmanni</i>			
301.	7396 <i>Isotoma hypocrateriformis</i> (Woodbridge Poison)			
302.	3992 <i>Isotropis cuneifolia</i> (Granny Bonnets)			
303.	4012 <i>Jacksonia furcellata</i> (Grey Stinkwood)			
304.	4029 <i>Jacksonia sternbergiana</i> (Stinkwood, Kapur)			
305.	1189 <i>Juncus pauciflorus</i> (Loose Flower Rush)			
306.	4044 <i>Kennedia prostrata</i> (Scarlet Runner)			
307.	4045 <i>Kennedia stirlingii</i> (Bushy Kennedia)			
308.	5832 <i>Kunzea ericifolia</i> (Spearwood, Pondil)			
309.	15498 <i>Kunzea glabrescens</i> (Spearwood)			
310.	20019 <i>Lachnagrostis filiformis</i>			
311.	19955 <i>Lachnagrostis plebeia</i>			

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312.	19956 <i>Lachnagrostis preissii</i>			
313.	<i>Lampona cylindrata</i>			
314.	28342 <i>Landoltia punctata</i> (Thin Duckweed)			
315.	4052 <i>Latrobea tenella</i>			
316.	<i>Latrodectus hasseltii</i>			
317.	1307 <i>Laxmannia ramosa</i> (Branching Lily)			
318.	1309 <i>Laxmannia squarrosa</i>			
319.	7568 <i>Lechenaultia biloba</i> (Blue Leschenaultia)			
320.	7572 <i>Lechenaultia expansa</i>			
321.	7574 <i>Lechenaultia floribunda</i> (Free-flowering Leschenaultia)			
322.	39038 <i>Leocarpus fragilis</i>			
323.	44490 <i>Leontodon rhagadioloides</i>	Y		
324.	925 <i>Lepidosperma angustatum</i>			
325.	937 <i>Lepidosperma longitudinale</i> (Pithy Sword-sedge)			
326.	944 <i>Lepidosperma scabrum</i>			
327.	29150 <i>Lepidosperma</i> sp. Margaret River (B.J. Lepschi 1841)			
328.	946 <i>Lepidosperma striatum</i>			
329.	1653 <i>Leporella fimbriata</i> (Hare Orchid)			
330.	19833 <i>Leptocarpus laxus</i>			
331.	1090 <i>Lepyrodia muirii</i>			
332.	25131 <i>Lerista distinguenda</i>			
333.	25133 <i>Lerista elegans</i>			
334.	6360 <i>Leucopogon australis</i> (Spiked Beard-heath)			
335.	6374 <i>Leucopogon conostephioides</i>			
336.	7676 <i>Levenhookia pusilla</i> (Midget Stylewort)			
337.	7677 <i>Levenhookia stipitata</i> (Common Stylewort)			
338.	25005 <i>Lialis burtonis</i>			
339.	31280 <i>Lichenomphalia chromacea</i>			
340.	31333 <i>Lichenomphalia umbellifera</i>			
341.	25661 <i>Lichmera indistincta</i> (Brown Honeyeater)			
342.	25415 <i>Limnodynastes dorsalis</i> (Western Banjo Frog)			
343.	9289 <i>Lobelia anceps</i> (Angled Lobelia)			
344.	7407 <i>Lobelia rhytidosperra</i> (Wrinkled-seeded Lobelia)			
345.	7408 <i>Lobelia tenuior</i> (Slender Lobelia)			
346.	1223 <i>Lomandra caespitosa</i> (Tufted Mat Rush)			
347.	1228 <i>Lomandra hermaphrodita</i>			
348.	1232 <i>Lomandra micrantha</i> (Small-flower Mat-rush)			
349.	1234 <i>Lomandra nigricans</i>			
350.	1239 <i>Lomandra preissii</i>			
351.	1243 <i>Lomandra sericea</i> (Silky Mat Rush)			
352.	1246 <i>Lomandra suaveolens</i>			
353.	1198 <i>Luzula meridionalis</i> (Field Woodrush)			
354.	39048 <i>Lycogala epidendrum</i>			
355.	<i>Lycosa ariadnae</i>			
356.	1097 <i>Lyginia barbata</i>			
357.	18049 <i>Lyginia imberbis</i>			
358.	6458 <i>Lysinema elegans</i>			
359.	2839 <i>Macarthuria australis</i>			
360.	24132 <i>Macropus fuliginosus</i> (Western Grey Kangaroo)			
361.	85 <i>Macrozamia riedlei</i> (Zamia, Djiridji)			
362.	24326 <i>Malacorhynchus membranaceus</i> (Pink-eared Duck)			
363.	25654 <i>Malurus splendens</i> (Splendid Fairy-wren)			
364.	24583 <i>Manorina flavigula</i> (Yellow-throated Miner)			
365.	17694 <i>Meeboldina scariosa</i>			
366.	25758 <i>Megalurus gramineus</i> (Little Grassbird)			
367.	37580 <i>Melaleuca acutifolia</i>			
368.	5926 <i>Melaleuca lateritia</i> (Robin Redbreast Bush)			
369.	5952 <i>Melaleuca preissiana</i> (Moonah)			
370.	5978 <i>Melaleuca teretifolia</i> (Banbar)			
371.	5980 <i>Melaleuca thymoides</i>			
372.	5987 <i>Melaleuca viminea</i> (Mohan)			
373.	13280 <i>Melaleuca viminea</i> subsp. <i>viminea</i>			
374.	25184 <i>Menetia greyii</i>			
375.	955 <i>Mesomelaena pseudostygia</i>			
376.	957 <i>Mesomelaena tetragona</i> (Semaphore Sedge)			
377.	25693 <i>Microeca fascinans</i> (Jacky Winter)			
378.	485 <i>Microlaena stipoides</i> (Weeping Grass)			
379.	15419 <i>Microtis media</i> subsp. <i>media</i>			
380.	37440 <i>Monopsis debilis</i> var. <i>depressa</i>	Y		
381.	4662 <i>Monotaxis grandiflora</i> (Diamond of the Desert)			

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382.	4666 <i>Monotaxis occidentalis</i>			
383.	25191 <i>Morethia lineocellata</i>			
384.	25192 <i>Morethia obscura</i>			
385.	24223 <i>Mus musculus</i> (House Mouse)	Y		
386.	6192 <i>Myriophyllum drummondii</i>			
387.	24738 <i>Neophema elegans</i> (Elegant Parrot)			
388.	492 <i>Neurachne alopecuroidea</i> (Foxtail Mulga Grass)			
389.	<i>Nicodamus mainae</i>			
390.	25748 <i>Ninox novaeseelandiae</i> (Boobook Owl)			
391.	25252 <i>Notechis scutatus</i> (Tiger Snake)			
392.	2401 <i>Nuytsia floribunda</i> (Christmas Tree, Mudja)			
393.	25564 <i>Nycticorax caledonicus</i> (Rufous Night Heron)			
394.	<i>Ocrisiona parmelliae</i>			
395.	24407 <i>Ocyphaps lophotes</i> (Crested Pigeon)			
396.	<i>Ommatoiulus moreletii</i>			
397.	12782 <i>Ophioglossum gramineum</i>			
398.	24085 <i>Oryctolagus cuniculus</i> (Rabbit)	Y		
399.	4358 <i>Oxalis purpurea</i> (Largeflower Wood Sorrel)	Y		
400.	25679 <i>Pachycephala pectoralis</i> (Golden Whistler)			
401.	25680 <i>Pachycephala rufiventris</i> (Rufous Whistler)			
402.	24693 <i>Pachyptila desolata</i> (Antarctic Prion)			
403.	1667 <i>Paracaleana nigrita</i> (Flying Duck Orchid)			
404.	516 <i>Parapholis incurva</i> (Coast Barbgrass)	Y		
405.	25253 <i>Parasuta gouldii</i>			
406.	25681 <i>Pardalotus punctatus</i> (Spotted Pardalote)			
407.	25682 <i>Pardalotus striatus</i> (Striated Pardalote)			
408.	7090 <i>Parentucellia viscosa</i> (Sticky Bartsia)	Y		
409.	528 <i>Paspalum distichum</i> (Water Couch)	Y		
410.	1550 <i>Patersonia occidentalis</i> (Purple Flag, Koma)			
411.	30471 <i>Patersonia occidentalis</i> var. <i>angustifolia</i>			
412.	24648 <i>Pelecanus conspicillatus</i> (Australian Pelican)			
413.	6006 <i>Pericalymma ellipticum</i> (Swamp Teatree)			
414.	16477 <i>Pericalymma ellipticum</i> var. <i>ellipticum</i>			
415.	2273 <i>Persoonia saccata</i> (Snottygobble)			
416.	24659 <i>Petroica goodenovii</i> (Red-capped Robin)			
417.	2299 <i>Petrophile linearis</i> (Pixie Mops)			
418.	25697 <i>Phalacrocorax carbo</i> (Great Cormorant)			
419.	25698 <i>Phalacrocorax melanoleucos</i> (Little Pied Cormorant)			
420.	24667 <i>Phalacrocorax sulcirostris</i> (Little Black Cormorant)			
421.	25699 <i>Phalacrocorax varius</i> (Pied Cormorant)			
422.	24409 <i>Phaps chalcoptera</i> (Common Bronzewing)			
423.	18529 <i>Philotheca spicata</i> (Pepper and Salt)			
424.	1173 <i>Philydrella pygmaea</i> (Butterfly Flowers)			
425.	1478 <i>Phlebocarya ciliata</i>			
426.	<i>Phryganoporus candidus</i>			
427.	24596 <i>Phylidonyris novaehollandiae</i> (New Holland Honeyeater)			
428.	4675 <i>Phyllanthus calycinus</i> (False Boronia)			
429.	39071 <i>Physarum luteolum</i>			Y
430.	39079 <i>Physarum viride</i>			
431.	<i>Phytophthora cinnamomi</i>			
432.	11404 <i>Pimelea imbricata</i> var. <i>major</i>			
433.	5252 <i>Pimelea lanata</i>			
434.	5254 <i>Pimelea leucantha</i>			
435.	24841 <i>Platalea flavipes</i> (Yellow-billed Spoonbill)			
436.	25720 <i>Platycercus icterotis</i> (Western Rosella)			
437.	24747 <i>Platycercus spurius</i> (Red-capped Parrot)			
438.	24750 <i>Platycercus zonarius</i> subsp. <i>semitorquatus</i> (Twenty-eight Parrot)			
439.	25007 <i>Pletholax gracilis</i> subsp. <i>gracilis</i> (Keeled Legless Lizard)			
440.	38825 <i>Pluteus pauperculus</i>			
441.	573 <i>Poa drummondiana</i> (Knotted Poa)			
442.	25703 <i>Podargus strigoides</i> (Tawny Frogmouth)			
443.	25704 <i>Podiceps cristatus</i> (Great Crested Grebe)			
444.	8175 <i>Podolepis gracilis</i> (Slender Podolepis)			
445.	8182 <i>Podotheca angustifolia</i> (Sticky Longheads)			
446.	24907 <i>Pogona minor</i> subsp. <i>minor</i> (Dwarf Bearded Dragon)			
447.	24681 <i>Poliocephalus poliocephalus</i> (Hoary-headed Grebe)			
448.	582 <i>Polypogon monspeliensis</i> (Annual Beardgrass)	Y		
449.	583 <i>Polypogon tenellus</i>			
450.	25722 <i>Polytelis anthopeplus</i> (Regent Parrot)			
451.	4691 <i>Poranthera microphylla</i> (Small Poranthera)			

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452.	25731 <i>Porphyrio porphyrio</i> (Purple Swamphen)			
453.	1670 <i>Prasophyllum drummondii</i> (Swamp Leek Orchid)			
454.	1676 <i>Prasophyllum hians</i> (Yawning Leek Orchid)			
455.	10853 <i>Prasophyllum plumiforme</i>			
456.	25511 <i>Pseudonaja affinis</i> (Dugite)			
457.	25259 <i>Pseudonaja affinis</i> subsp. <i>affinis</i> (Dugite)			
458.	42416 <i>Pseudonaja mengdeni</i> (Western Brown Snake)			
459.	1693 <i>Pterostylis recurva</i> (Jug Orchid)			
460.	1698 <i>Pterostylis vittata</i> (Banded Greenhood)			
461.	2718 <i>Ptilotus drummondii</i> (Narrowleaf Mulla Mulla)			
462.	4181 <i>Pultenaea reticulata</i>			
463.	24245 <i>Rattus rattus</i> (Black Rat)	Y		
464.	24776 <i>Recurvirostra novaehollandiae</i> (Red-necked Avocet)			
465.	25614 <i>Rhipidura leucophrys</i> (Willie Wagtail)			
466.	13300 <i>Rhodanthe citrina</i>			
467.	1556 <i>Romulea rosea</i> (Guildford Grass)	Y		
468.	40431 <i>Rytidosperma acerosum</i>			
469.	7603 <i>Scaevola canescens</i> (Grey Scaevola)			
470.	7634 <i>Scaevola phlebopetala</i> (Velvet Fanflower)			
471.	6263 <i>Schoenolaena juncea</i>			
472.	982 <i>Schoenus clandestinus</i>			
473.	984 <i>Schoenus curvifolius</i>			
474.	986 <i>Schoenus efoliatus</i>			
475.	994 <i>Schoenus humilis</i>			
476.	1007 <i>Schoenus pedicellatus</i>			
477.	1017 <i>Schoenus subbulbosus</i>			
478.	1023 <i>Schoenus tenellus</i>			
479.	6033 <i>Scholtzia involucrata</i> (Spiked Scholtzia)			
480.	25534 <i>Sericornis frontalis</i> (White-browed Scrubwren)			
481.	<i>Servaea melaina</i>			
482.	<i>Servaea spinibarbis</i>			
483.	2909 <i>Silene gallica</i> (French Catchfly)	Y		
484.	8225 <i>Siloxerus humifusus</i> (Procumbent Siloxerus)			
485.	<i>Simaetha tenuior</i>			
486.	25266 <i>Simoselaps bertholdi</i> (Jan's Banded Snake)			
487.	30948 <i>Smicromis brevirostris</i> (Weebill)			
488.	7022 <i>Solanum nigrum</i> (Black Berry Nightshade)	Y		
489.	8231 <i>Sonchus oleraceus</i> (Common Sowthistle)	Y		
490.	1312 <i>Sowerbaea laxiflora</i> (Purple Tassels)			
491.	<i>Steatoda grossa</i>			
492.	39085 <i>Stemonitis lignicola</i>			
493.	39087 <i>Stemonitis splendens</i>			
494.	2316 <i>Stirlingia latifolia</i> (Blueboy)			
495.	25597 <i>Strepera versicolor</i> (Grey Currawong)			
496.	25589 <i>Streptopelia chinensis</i> (Spotted Turtle-Dove)	Y		
497.	30951 <i>Streptopelia chinensis</i> subsp. <i>tigrina</i> (Spotted Turtle-Dove)	Y		
498.	25590 <i>Streptopelia senegalensis</i> (Laughing Turtle-Dove)	Y		
499.	25831 <i>Stylidium araeophyllum</i>			
500.	7693 <i>Stylidium brunonianum</i> (Pink Fountain Triggerplant)			
501.	7696 <i>Stylidium calcaratum</i> (Book Triggerplant)			
502.	7699 <i>Stylidium carnosum</i> (Fleshy-leaved Triggerplant)			
503.	7717 <i>Stylidium divaricatum</i> (Daddy-long-legs)			
504.	7718 <i>Stylidium diversifolium</i> (Touch-me-not)			
505.	7734 <i>Stylidium guttatum</i> (Dotted Triggerplant)			
506.	7774 <i>Stylidium piliferum</i> (Common Butterfly Triggerplant)			
507.	7785 <i>Stylidium repens</i> (Matted Triggerplant)			
508.	7790 <i>Stylidium roseoalatum</i> (Pink-wing Triggerplant)			
509.	7798 <i>Stylidium schoenoides</i> (Cow Kicks)			
510.	7806 <i>Stylidium utricularioides</i> (Pink Fan Triggerplant)			
511.	1260 <i>Stypandra glauca</i> (Blind Grass)			
512.	2326 <i>Synaphea polymorpha</i> (Albany Synaphea, Pinda)			
513.	2329 <i>Synaphea spinulosa</i>			
514.	15532 <i>Synaphea spinulosa</i> subsp. <i>spinulosa</i>			
515.	25705 <i>Tachybaptus novaehollandiae</i> (Australasian Grebe, Black-throated Grebe)			
516.	24682 <i>Tachybaptus novaehollandiae</i> subsp. <i>novaehollandiae</i> (Australasian Grebe, Black-throated Grebe)			
517.	24331 <i>Tadorna tadornoides</i> (Australian Shelduck, Mountain Duck)			
518.	<i>Tamopsis distinguenda</i>			
519.	<i>Tamopsis perthensis</i>			
520.	24167 <i>Tarsipes rostratus</i> (Honey Possum, Noolbenger)			

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521.	20135 <i>Taxandria linearifolia</i>			
522.	<i>Tetragnatha valida</i>			
523.	1036 <i>Tetraria octandra</i>			
524.	1702 <i>Thelymitra campanulata</i> (Shirt Orchid)			
525.	1705 <i>Thelymitra crinita</i> (Blue Lady Orchid)			
526.	11053 <i>Thelymitra macrophylla</i>			
527.	1710 <i>Thelymitra mucida</i> (Plum Orchid)			
528.	20731 <i>Thelymitra vulgaris</i>			
529.	20728 <i>Thelymitra xanthotricha</i>			
530.	24844 <i>Threskiornis molucca</i> (Australian White Ibis)			
531.	24845 <i>Threskiornis spinicollis</i> (Straw-necked Ibis)			
532.	1318 <i>Thysanotus arbuscula</i>			
533.	1319 <i>Thysanotus arenarius</i>			
534.	1328 <i>Thysanotus dichotomus</i> (Branching Fringe Lily)			
535.	1339 <i>Thysanotus multiflorus</i> (Many-flowered Fringe Lily)			
536.	1343 <i>Thysanotus patersonii</i>			
537.	1351 <i>Thysanotus sparteus</i>			
538.	1357 <i>Thysanotus thyrsoides</i>			
539.	25203 <i>Tiliqua occipitalis</i> (Western Bluetongue)			
540.	25519 <i>Tiliqua rugosa</i>			
541.	25207 <i>Tiliqua rugosa</i> subsp. <i>rugosa</i>			
542.	25549 <i>Todiramphus sanctus</i> (Sacred Kingfisher)			
543.	6280 <i>Trachymene pilosa</i> (Native Parsnip)			
544.	38845 <i>Trechispora farinacea</i>			
545.	1481 <i>Tribonanthes australis</i>			
546.	4383 <i>Tribulus terrestris</i> (Caltrop)	Y		
547.	8251 <i>Trichocline spathulata</i> (Native Gerbera)			
548.	25723 <i>Trichoglossus haematodus</i> (Rainbow Lorikeet)			
549.	25521 <i>Trichosurus vulpecula</i> (Common Brushtail Possum)			
550.	24158 <i>Trichosurus vulpecula</i> subsp. <i>vulpecula</i> (Common Brushtail Possum)			
551.	1361 <i>Tricoryne elatior</i> (Yellow Autumn Lily)			
552.	1363 <i>Tricoryne tenella</i>			
553.	4292 <i>Trifolium campestre</i> (Hop Clover)	Y		
554.	24849 <i>Turnix varia</i> subsp. <i>varia</i> (Painted Button-quail)			
555.	24852 <i>Tyto alba</i> subsp. <i>delicatula</i> (Barn Owl)			
556.	<i>Urodacus novaehollandiae</i>			
557.	8255 <i>Ursinia anthemoides</i> (Ursinia)	Y		
558.	25218 <i>Varanus gouldii</i> (Bungarra or Sand Monitor)			
559.	722 <i>Vulpia bromoides</i> (Squirrel Tail Fescue)	Y		
560.	724 <i>Vulpia myuros</i> (Rat's Tail Fescue)	Y		
561.	12052 <i>Vulpia myuros</i> forma <i>megalura</i>	Y		
562.	33101 <i>Vulpia myuros</i> forma <i>myuros</i>	Y		
563.	8282 <i>Waitzia suaveolens</i> (Fragrant Waitzia)			
564.	18118 <i>Watsonia meriana</i> var. <i>meriana</i>	Y		
565.	12072 <i>Wurmbea dioica</i> subsp. <i>alba</i>			
566.	1256 <i>Xanthorrhoea preissii</i> (Grass tree, Palga)			
567.	6289 <i>Xanthosia huegelii</i>			
568.	2331 <i>Xylomelum occidentale</i> (Woody Pear, Djandin)			
569.	1049 <i>Zantedeschia aethiopica</i> (Arum Lily)	Y		
570.	<i>Zebraplatys fractivittata</i>			
571.	25765 <i>Zosterops lateralis</i> (Grey-breasted White-eye, Silveryeye)			

Conservation Codes

- T - Rare or likely to become extinct
- X - Presumed extinct
- IA - Protected under international agreement
- S - Other specially protected fauna
- 1 - Priority 1
- 2 - Priority 2
- 3 - Priority 3
- 4 - Priority 4
- 5 - Priority 5

¹ For NatureMap's purposes, species flagged as endemic are those whose records are wholly contained within the search area. Note that only those records complying with the search criterion are included in the calculation. For example, if you limit records to those from a specific datasource, only records from that datasource are used to determine if a species is restricted to the query area.