LOT 495 MOSES ROCK ROAD, WILYABRUP

December 2018

Flora and fauna assessment

Environmental & Landscape Management

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Table of Contents

Disclaimer: All attempts have been made to ensure the accuracy of the material presented in this report. However, some information may be inaccurate due to changes to database information or government policy or legislation. Seasonal variation and the ephemeral nature of native vegetation also present limitations on the overall accuracy of the information in this report

DOCUMENT STATUS

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Executive summary

Lot 495 Moses Rock Road, Wilyabrup ('the site') has previously been used for pasture and grazing. The site has not been extensively grazed in recent years.

A minor drainage line runs in a north-westerly direction across the middle of the site. This area contains a large number of native grass trees and associated native rushes. Given the grazing history of the area, pasture grasses are common and some environmental weeds are present.

The current owners propose to construct a dam on the drainage channel with a dam wall around 50-100 metres from the western boundary.

Several day time traverses of the site were undertaken to determine the range of flora and fauna species that are present within the area subject to clearing for the new dam and borrow pit. In addition, a number of soil samples were collected to determine if the Schedule 1 listed Cape Leeuwin Snail (*Austroassiminea letha*) is present in this area.

The desktop assessment identified that the vegetation types across the site are not part of poorly represented vegetation communities. The site assessment found that there is a limited range of native plant species within the creekline. The soil analysis did not find any evidence that the Cape Leeuwin Snail is present in the creekline area. The willow peppermints on the southern portion of the site are likely to provide habitat for Western Ringtail Possums (*Pseudocheirus occidentalis*). This area will not be impacted by the current proposal.

Black cockatoos were observed ranging across the site. While there is limited habitat for cockatoos, there are nearby water sources on neighbouring lots and some feeding opportunities, including the grass tree seeds. Further planting of willow peppermints may assist in creating additional habitat on the overall site, where such planting is deemed appropriate.

Grass trees and some of the native rushes, particularly the knotted club rush (*Ficinia nodosa*) can be successfully transplanted. It is understood that the proponent is in favour of transplanting grass trees and some of the rushes to assist with the landscape treatment of the proposed dam wall. This will assist in addressing visual impact concerns and will ensure ongoing feeding opportunities for Black Cockatoos.

Introduction

Lot 495 Moses Rock Road is currently being used for grazing and pasture production. In order to provide the opportunity to plant tree crops, provide water for stock and irrigate gardens, the proponent would like to install a dam on the western boundary of the overall site.

The dam will be built along a drainage line that cuts through the centre of the lot from the south eastern corner to the north western corner.

Scope of report

This report outlines the findings of a number of site visits to determine the flora and fauna values of the site.

Biodiversity conservation

The south western botanical province is one of twenty five global biodiversity hot spots and the only one in Australia (EPA, 2008). The EPA's objective for biodiversity conservation is to maintain the abundance, diversity, geographic distribution and productivity of all life forms through the avoidance or management of adverse impacts and improvement in knowledge.

The EPA's goal is to maintain at least 30% of the pre-clearing extent of ecological communities. A number of measures are recommended for protecting biodiversity.

- Conserve biodiversity in-situ – through both a comprehensive, adequate and representative reserve system and managing all land use and development to meet overall biodiversity targets and objectives for a region.
- Avoid clearing – through limiting development to already cleared areas and avoiding further clearing for agriculture in the south-western agriculture area.
- Protect ecological linkages – protecting and enhancing ecological linkages between key ecological areas.
- Anticipate threats to biodiversity – threats to biodiversity should be anticipated and managed. Threats include the spread of invasive species and diseases, salinity, pollution, altered surface water regimes and

groundwater regimes, altered fire regimes, the escape of genetically modified organisms, soil degradation and the fragmentation of native habitat.

- Make informed decisions – decisions should be informed and where information is lacking, the Precautionary Principle should be applied.
- Apply the Natural Resources Management Framework – as it is set out in the EPA Position Statement No. 8.
- Apply new understandings – from ongoing research, monitoring and evaluation.
- Mitigate adverse impacts – projects with significant impacts on the environment should be required to demonstrate mitigation of impacts through a hierarchy of avoidance, minimisation, rectification, reduction and offsets as a last resort.
- Share responsibility – all people including all levels of government, resource users, indigenous groups and the community in general have a responsibility for biodiversity protection.

Clearing native vegetation is restricted under Schedule 5 of the *Environmental Protection Act 1986*. Native vegetation should not be cleared if it fits any of the following categories:

a) it comprises a high level of biological diversity;

b) it comprises the whole or part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to Western Australia;

c) it includes, or is necessary for the continued existence of, rare flora;

d) it comprises the whole or a part of, or is necessary for the maintenance of, a threatened ecological community;

e) it is significant as a remnant of native vegetation in an area that has been extensively cleared;

f) it is growing in, or in association with, an environment associated with a watercourse or wetland;

g) the clearing of the vegetation is likely to cause appreciable land degradation;

h) the clearing of the vegetation is likely to have an impact of the environmental values of any adjacent or nearby conservation area;

i) the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water;

j) the clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.

Ecological communities are protected under the Federal *Environmental Protection and Biodiversity Protection Act 1999* and the WA *Biodiversity Conservation Act 2016* and both State and Federal registers exist.

Significant flora and fauna are protected by the *WA Biodiversity Conservation Act 2016*. Priority and Rare flora and fauna are listed under the Act. Habitat areas listed under JAMBA and CAMBA migratory bird agreements should be protected.

Wetlands and buffers listed under the Ramsar agreement, Important Wetlands of Australia, EPP wetlands and Conservation Category wetlands are all expected to be protected.

Wild rivers listed by the Australian Heritage Council and the Department of Biodiversity, Conservation and Attractions are expected to be protected.

Landscapes and landforms accepted by the EPA should be protected.

Natural areas of world, state or national significance should be protected along with areas protected under the *Aboriginal Heritage Act 1972*.

Flora assessments

Western Australia has a rich source of biodiversity by world standards. Native vegetation has a critical role in maintaining ecological processes that support the right conditions for life and preventing land and water degradation. Of 819 vegetation associations in WA, 119 have been cleared to below 30% of their pre-European colonisation extent, 48 are at less than 10% and 2 are presumed extinct.

The EPA requires that adequate survey and analysis of native vegetation is carried out prior to development. There are two Guidance Statements that provide direction on the survey of native vegetation, Guidance Statement Number 3 – Terrestrial Biodiversity Surveys as an Element of Biodiversity Protection and Guidance Statement Number 51 – Terrestrial Flora and Vegetation Surveys for Environment Impact Assessment in Western Australia.

Fauna assessment

The Environmental Protection Authority (EPA) provides a number of Guidance Statements to assist with assessing fauna values of a site. Guidance Statement Number 33 – Environmental Guidance for Planning and Development provides overall guidelines including those for fauna assessments. Guidance Statement Number 56 provides advice on Terrestrial Fauna Surveys for Environmental Impact Assessment in Western Australia.

The Study Area

Tenure and vesting

The overall site is 41.42 hectares in size and is zoned Rural Landscape under the City of Busselton Town Planning Scheme. Development within the Rural Landscape zone is expected to maintain the rural character of the locality and minimise disturbance to the local amenity. The local government seeks to provide incentives for landowners to implement rural landscape improvements such as rehabilitation/revegetation and soil stabilisation. The town planning scheme seeks to prohibit the clearing of any vegetation except where it is required for dwellings, outbuildings or to provide access.

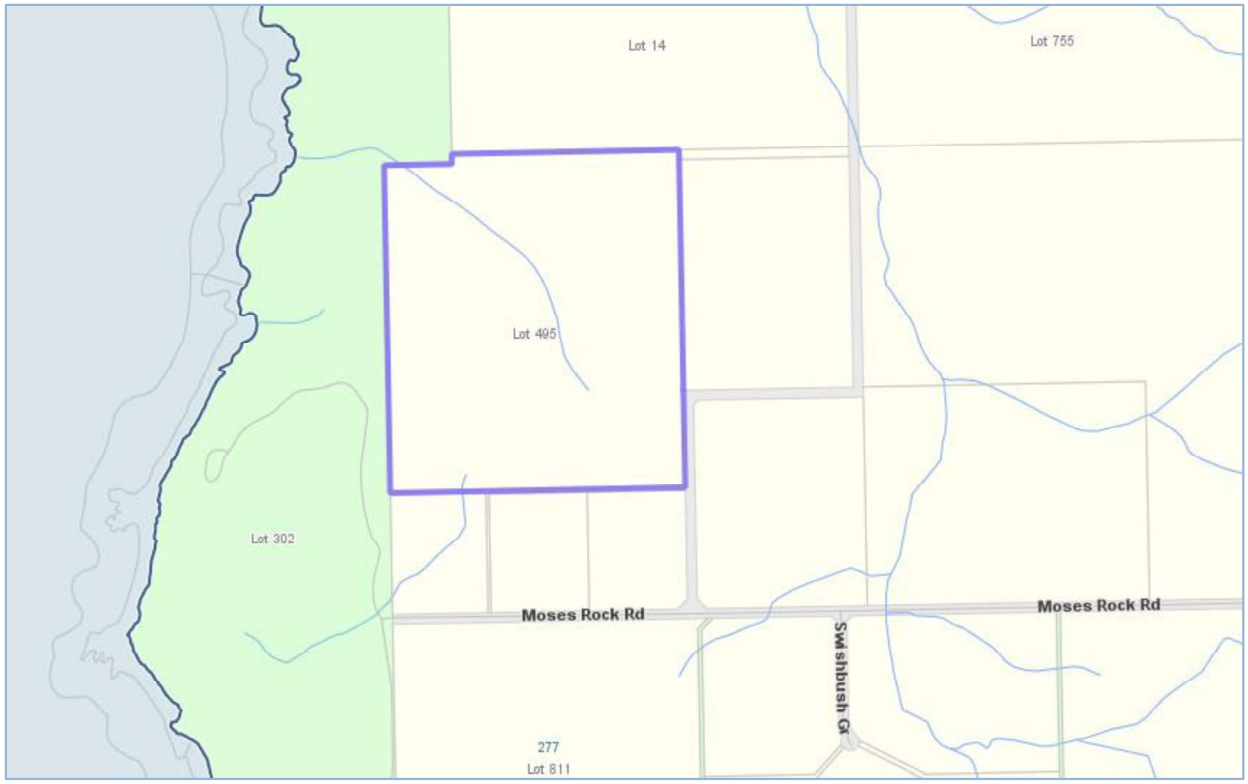

FIGURE 1: LOCATION IMAGE (IMAGE COURTESY OF THE CITY OF BUSSELTON INTRAMAPS).

The whole site is within the Landscape Value Special Control Area. Development in this area is expected to be compatible with the maintenance and enhancement of the existing rural and scenic character of the locality.

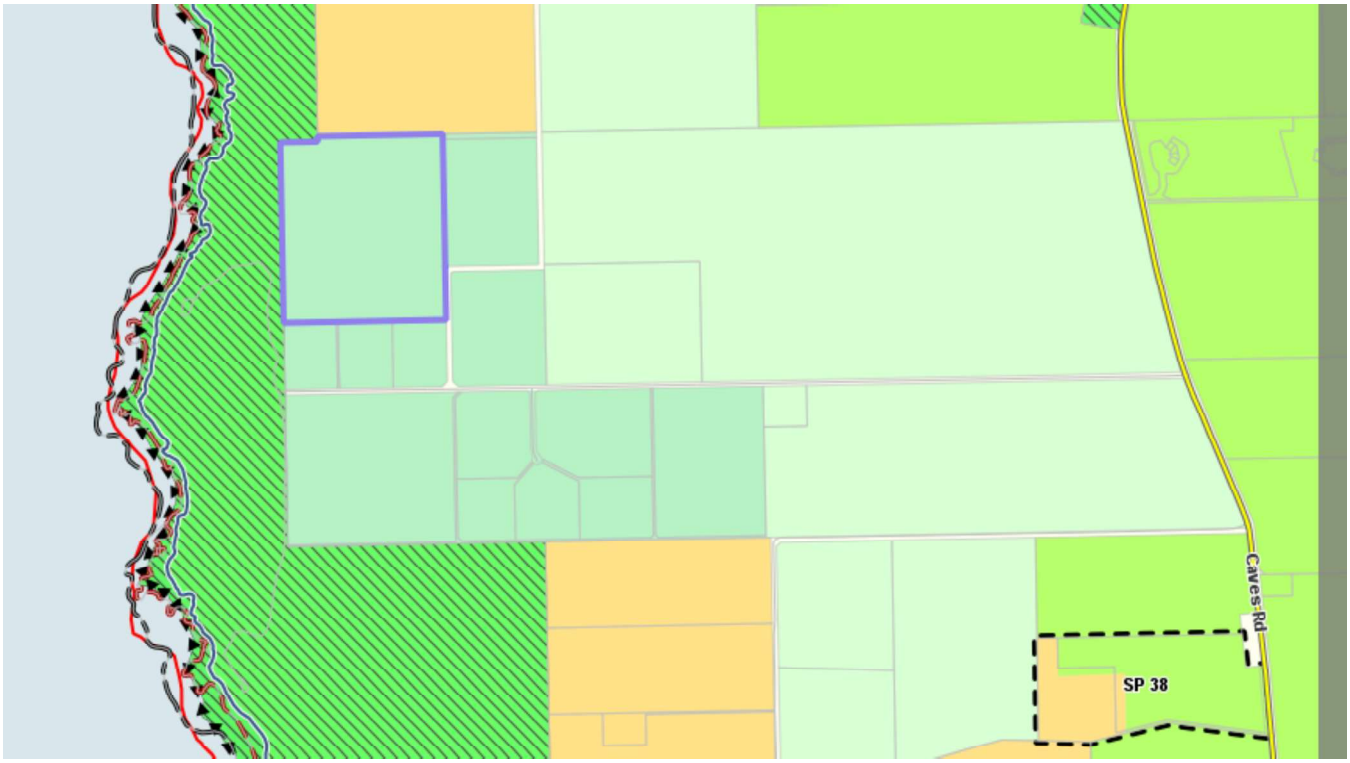

FIGURE 2: LOCAL ZONING MAP (SOURCE: CITY OF BUSSELTON TOWN PLANNING SCHEME)

The Natural Environment

The biological environment

Vegetation

Remnant vegetation identified on the site in mapping (see Figure 3) provided by the Department of Agriculture includes the groves of willow peppermint (*Agonis flexuosa*) trees on the southern extent of the site and the low scrub on the north-western boundary. The low vegetation through the centre of the site is not included in the mapping.

The Beard vegetation type 14 is found on the western portion of the site (see Figure 4). This vegetation is described as thicket consisting of wattle, casuarina and tea trea. The remainder of the site is classified as Beard Vegetation type 15, open scrub or sparse scrub which is dominated by wattle and tea tree.

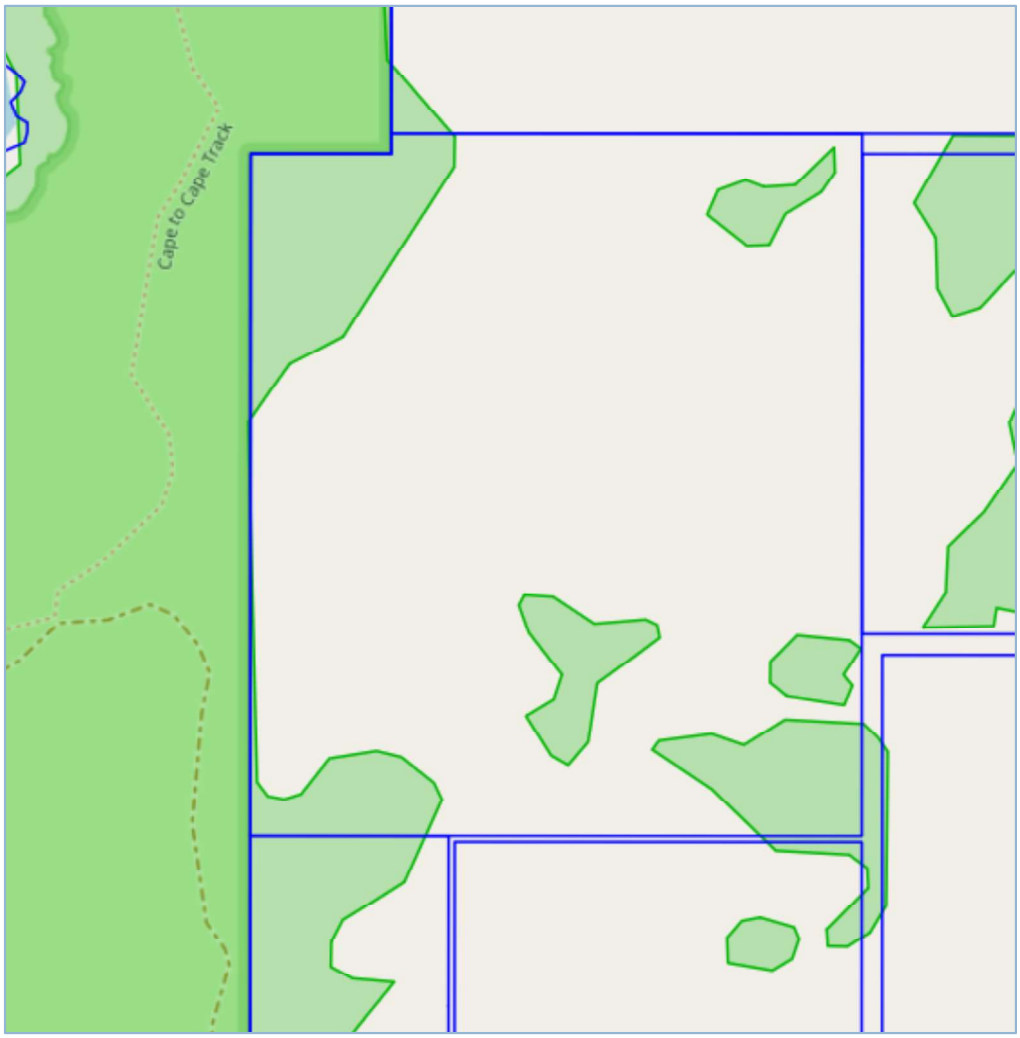

FIGURE 3: VEGETATION COMPLEXES IN THE LOCAL AREA (IMAGE COURTESY OF THE DEPARTMENT OF AGRICULTURE, 2013).

Table 1: Vegetation types remnant vegetation on the site.

Description	Beard Vegetation type	NVIS Vegetation type	Environmental Description	NVIS Lv2 Structural Formation	NVIS Lv3 - Broad Floristic Formation Description
Thicket	14			Thicket	Wattle, casuarina and teatree acacia-allocasuarina-melaleuca

					alliance.
Scrub, open scrub or sparse scrub	15			Scrub, open scrub or sparse scrub	Wattle, teatree and other species Acacia spp. and Melaleuca spp.

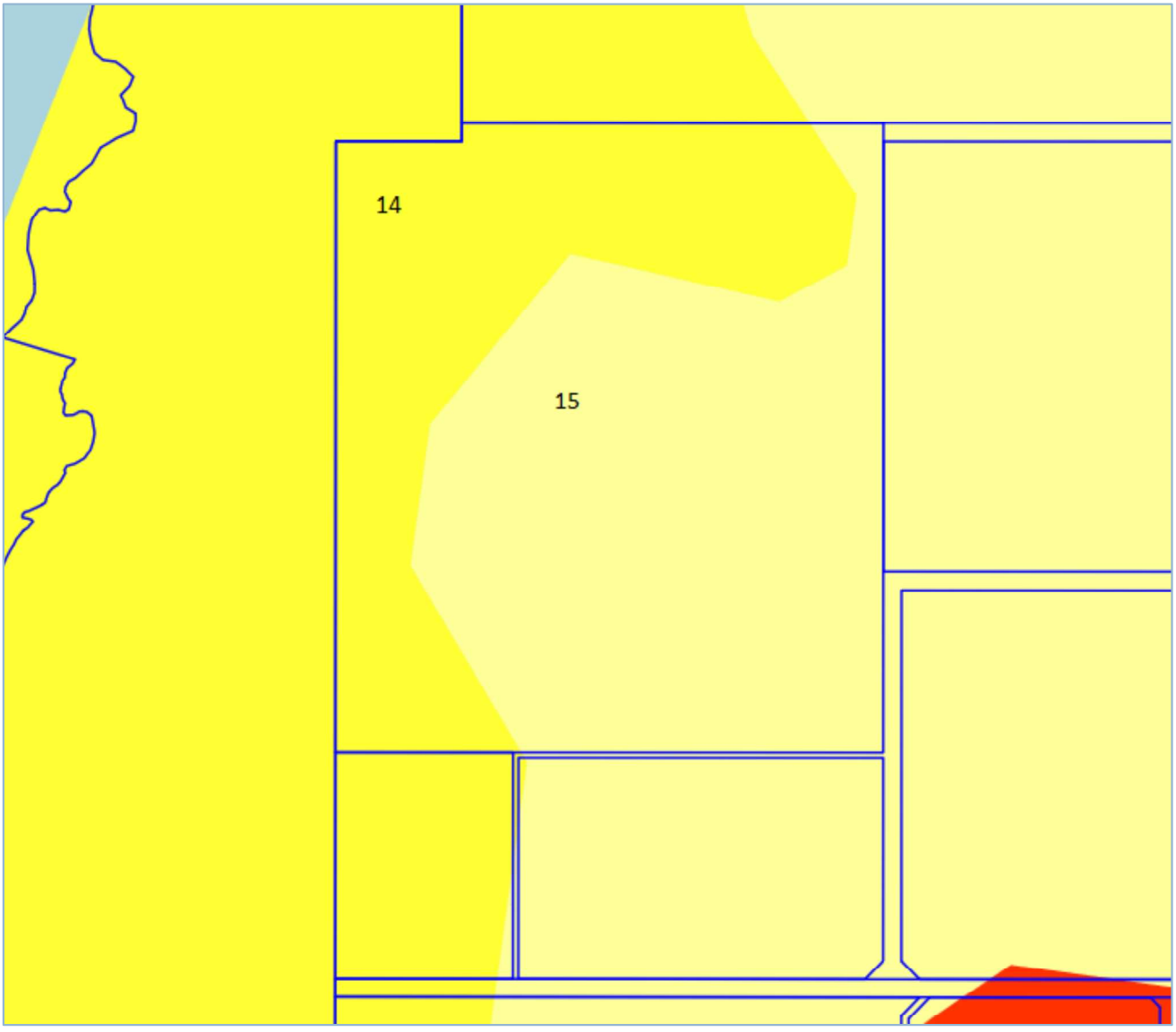

FIGURE 4: BEARD VEGETATION TYPES ACROSS THE SITE (SOURCE; DEPARTMENT OF AGRICULTURE).

The Regional Forest Agreement mapping available from the Department of Biodiversity, Conservation and Attractions (see Figure 5) indicates that the site is dominated by the Cowaramup vegetation community (Cr). This community is not listed as poorly represented by Mattiske and Havel (2002). Other vegetation communities found on the lot include the Cowaramup (Cd) in the north-eastern corner of the lot and the Kilcarnup (KE) in the south western and south eastern corners of the lot. Neither of these communities are listed as poorly represented and are not impacted by the current proposal.

FIGURE 5: VEGETATION MAPPING ACCORDING THE REGIONAL FOREST AGREEMENT VEGETATION COMPLEXES (IMAGE COURTESTY OF DBCA).

Declared Rare and Priority Flora

Declared Rare flora species are gazetted under the *Biodiversity Conservation Act 2016*. Priority flora species are listed by the Department of Biodiversity, Conservation and Attractions (DBCA) as flora that are under consideration for declaration as Rare Flora.

The following classifications are used by the DEC/DBCA and are listed on the Florabase website (http://florabase.dec.wa.gov.au/conservationtaxa, 2011):

X – Declared Rare Flora - Presumed Extinct - taxa which have not been collected, or otherwise verified, over the past 50 years despite thorough searching, or of which all known wild populations have been destroyed more recently, and have been gazetted as such, following approval by the Minister for the Environment, after recommendation by the State's Endangered Flora Consultative Committee.

R – Declared Rare Flora – Extant taxa which have been adequately searched for, and are deemed to be in the wild either rare, in danger of extinction, or otherwise in need of special protection, and have been gazetted as such, following approval by the Minister for the Environment, after recommendation by the State's Endangered Flora Consultative Committee. *(= Threatened Flora = Endangered + Vulnerable)*.

Priority One – Poorly Known taxa which are known from one or a few (generally <5) populations which are under threat, either due to small population size, or being on lands under immediate threat, e.g. road verges, urban areas, farmland, active mineral leases, etc., or the plants are under threat, e.g. from disease, grazing by feral animals, etc. May include taxa with threatened populations on protected lands. Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey.

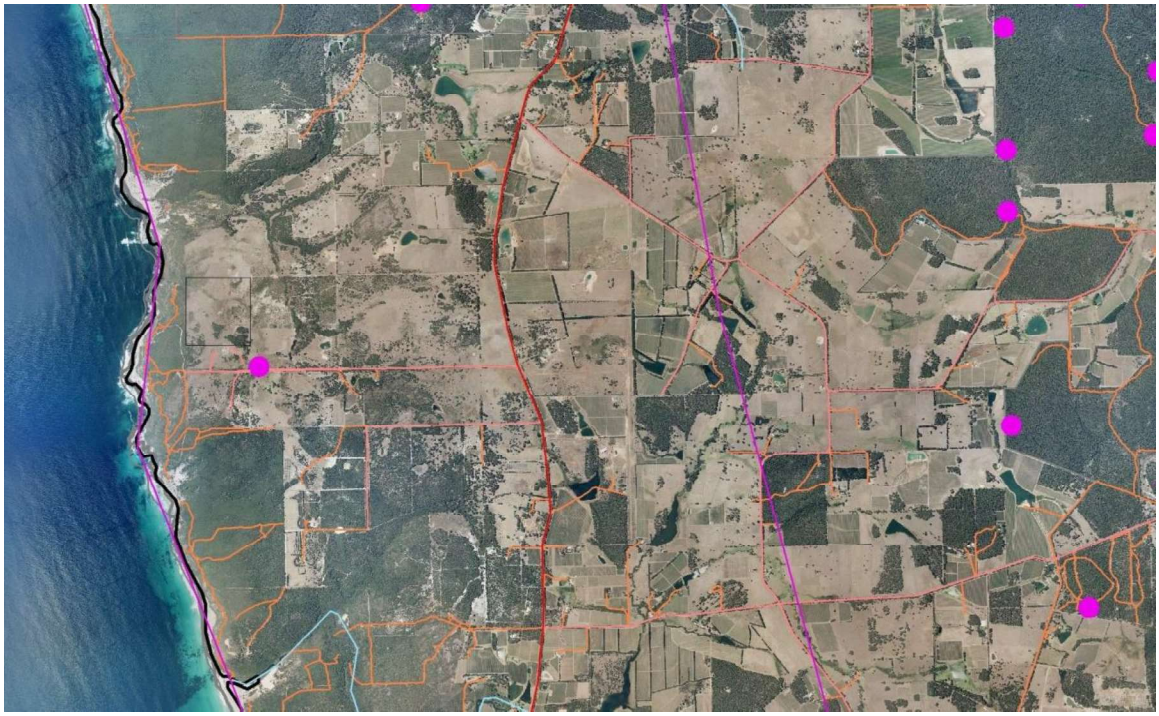

FIGURE 6: DECLARED RARE FLORA IDENTIFIED NEAR THE SITE (SOURCE: DEPARTMENT OF AGRICULTURE)

Priority Two – Poorly known taxa which are known from one or a few (generally <5) populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey.

Priority Three – taxa which are known from several populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora', but are in need of further survey.

Priority Four - rare taxa which are considered to have been adequately surveyed and which, whilst being rare (in Australia), are not currently threatened by any identifiable factors. These taxa require monitoring every 5–10 years.

Threatened and Priority fauna

Fauna are similarly protected under the *Biodiversity Conservation Act 2016*. The following classifications are used by the Department of Biodiversity, Conservation and Attractions.

Schedule 1 – Fauna that is rare or likely to become extinct

Schedule 2 – Presumed extinct

Schedule 3 – Birds protected under international agreement

Schedule 4 – Other specially protected fauna

Priority 1 – Species with few, poorly known populations on threatened lands

Priority 2 – Taxa with few, poorly known populations on conservation lands

Priority 3 – Species with several poorly known populations, some on conservation land

Priority 4 – Taxa in need of monitoring

Priority 5 – Taxa in need of monitoring (conservation dependent).

Local and Regional Significance

Under the Rural Landscape zoning the native vegetation across the site has a high level of protection.

Threatened Ecological Communities

Threatened Ecological Communities are protected under the WA State *Biodiversity Conservation Act 2016* and Federal Government's *Environmental Protection and Biodiversity Conservation Act 1999*.

The definitions for Threatened Ecological Communities that are used by the DBCA are as follows (DEC, 2010):

Presumed Totally Destroyed (PD) - An ecological community that has been adequately searched for but for which no representative occurrences have been located.

Critically Endangered (CR) - An ecological community that has been adequately surveyed and found to have been subject to a major contraction in area and/or that was originally of limited distribution and is facing severe modification or destruction throughout its range in the immediate future, or is already severely degraded throughout its range but capable of being substantially restored or rehabilitated.

Endangered (EN) - An ecological community that has been adequately surveyed and found to have been subject to a major contraction in area and/or was originally of limited distribution and is in danger of significant modification throughout its range or severe modification or destruction over most of its range in the near future.

Vulnerable (VU) - An ecological community that has been adequately surveyed and is found to be declining and/or has declined in distribution and/or condition and whose ultimate security has not yet been assured and/or a community that is still widespread but is believed likely to move into a category of higher threat in the near future if threatening processes continue or begin operating throughout its range.

Priority One: Poorly-known ecological communities.

Ecological communities that are known from very few occurrences with a very restricted distribution (generally ≤5 occurrences or a total area of ≤ 100ha).

Priority Two: Poorly-known ecological communities

Communities that are known from few occurrences with a restricted distribution (generally ≤10 occurrences or a total area of ≤200ha).

Priority Three: Poorly known ecological communities

Priority Four: Ecological communities that are adequately known, rare but not threatened or meet criteria for Near Threatened, or that have been recently removed from the threatened list. These communities require regular monitoring.

Priority Five: Conservation Dependent ecological communities

Ecological communities that are not threatened but are subject to a specific conservation program, the cessation of which would result in the community becoming threatened within five years.

FIGURE 7: THREATENED ECOLOGICAL COMMUNITIES NEAR THE SITE (SOURCE: DEPARTMENT OF AGRICULTURE)

Threatened Ecological Communities that occur in the local area are shown on Figure 7.

The Physical Environment

Soils

The Cowaramup rocky gentle slopes phase (COr2) soil type covers the majority of the overall lot (Department of Agriculture, 2018). These soils consist of rocky flats and gentle slopes on laterite and granite in the Gracetown and Moses Rock locales. Soils are described as stony, loamy and sandy duplexes (and are often gravelly). Vegetation usually consists of marri-jarrah woodland and coastal scrub.

The north eastern corner of the lot is dominated by the Cowaramup deep sandy rises phase (COd2) (Department of Agriculture, 2018). These soils consist of sandy rises and flats on aeolian sand over a weathered mantle and/or granite in the Margaret River district between Eagle Bay and Augusta. Soils are described as pale deep sands with some gravelly pale deep sands and pale shallow sands. Typical vegetation includes jarrah, marri, banksia and sheoak woodland. Approximately one-third of the soils found in this map unit present some risk of phosphorous export.

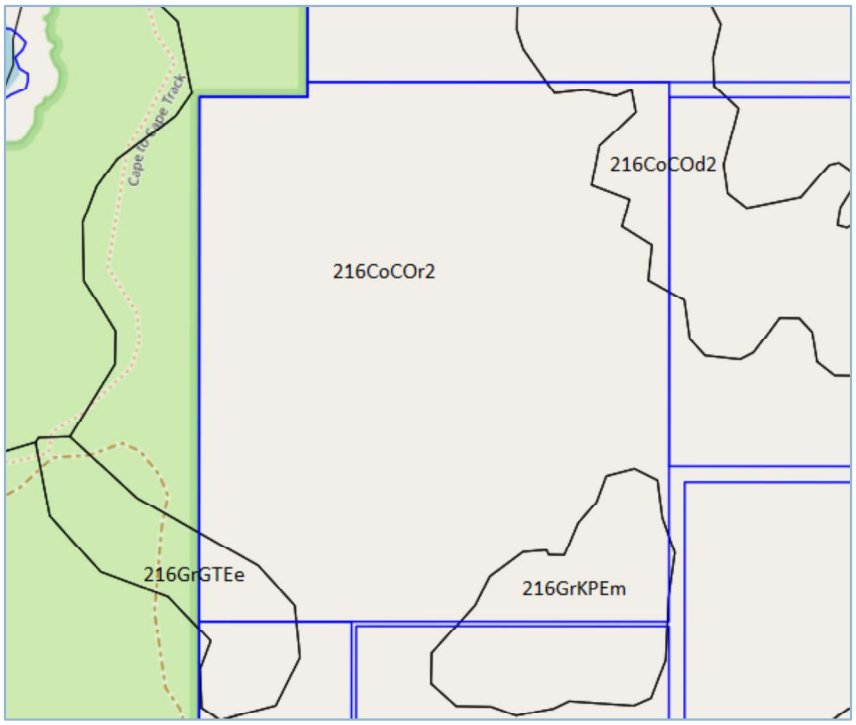

FIGURE 8: SOIL TYPES ACROSS THE SITE (SOURCE: DEPARTMENT OF AGRICULTURE)

Other soils found on the site include the Gracetown exposed slopes phase (216GrGTEe) Kilcarnup blowout phase (216GrKPEm).

Hydrology

The site varies between 44 and 68 metres above sea level. A minor drainage line originates on the site and flows to the nearby coast. This is an un-named drainage line and has not been assessed for overall condition by Pen (1997). The drainage line falls within the Quinninup sub-catchment though no waters flow into the Quinninup Brook.

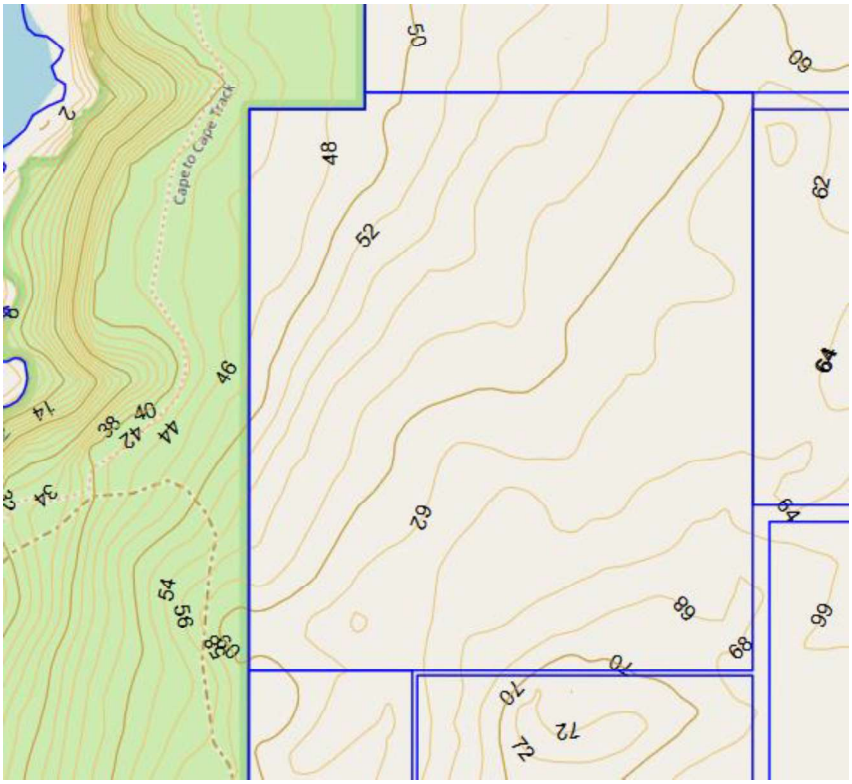

FIGURE 9: SITE CONTOURS (SOURCE: DEPARTMENT OF AGRICULTURE)

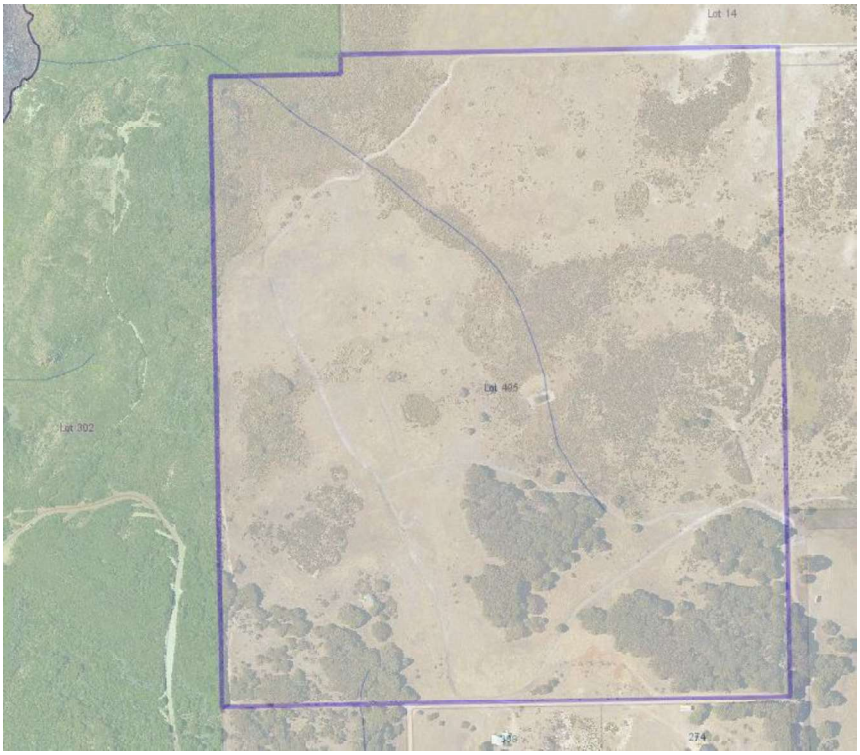

FIGURE 10: DRAINAGE LINE ORIGINATING ON THE SITE (SOURCE: CITY OF BUSSELTON INTRAMAPS)

Site Assessment Methodology

Prior to conducting the site assessment, a desktop assessment was undertaken of aerial photography and other relevant information. A number of field visits were undertaken during the daytime to determine the range of flora species that are found at the site. The flora assessment has been carried out in accordance with the EPA Guidance Statement 51, Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia (EPA, 2004).

Monitoring was carried out to determine if the Cape Leeuwin Freshwater Snail (*Austroassemina letha*) is present on the site according to the protocols in the Cape Leeuwin Freshwater Snail Monitoring Report (2009) (Department of Environment and Conservation South West Region).

Results and discussion

Site survey results:

Flora species

The vegetation in the area that is proposed for clearing to allow the construction of the dam consists of a mixture of coastal scrub and some wetland vegetation including;

- Trees (growing in nearby areas – not within the creekline) – Willow peppermint (Agonis flexuosa) and marri (Corymbia calophylla)
- Shrubs – Spyridium globulosum
- Understorey species – Xanthorrhea preissii, Ficinia nodosa, Muehlenbeckia adpressa, Hibbertia cuneiformis, Olearia axillaris, Patersonia occidentalis, Mesemolaena spp., Lepidosperma spp., Billardiera heterophylla, Conostylis spp., Microtis spp.
- Weed species – arum lily (Zantedeschia aethiopica), cape weed (Arctotheca calendula), Guildford grass (Romulea rosea), dandelion (Taraxacum officianale), wild oats (Avena spp.), Pelargonium capitatus., apple of Sodom (Solanum linnaeanum), thistle species, one leaf cape tulip (Homeria flaccida), Cotula coronopifolia, Disa bracteata, pasture grasses

Vegetation

The vegetation within the area that is proposed for clearing consists of scrub dominated by grass trees (Xanthorrhoea preisii), knotted club rush (Ficinia nodosa) and Lepidosperma spp. interspersed with a number of

other shrub and groundcover species, along with a number of significant weed species. Arum lily is commonly found among the grass trees and pasture weed species dominate the more open areas.

The vegetation structure is considered to be an open heath (as per Table 2) with the dominant species being grass trees.

The overall vegetation condition varies from 'Good' in relatively small pockets or clumps of vegetation to 'Degraded' in the more sparse areas with numerous weed species.

TABLE 2: VEGETATION STRUCTURAL CLASSES TAKEN FROM BUSH FOREVER (GOVERNMENT OF WESTERN AUSTRALIA, 2000).

Life Form / Height Class	*Canopy Cover (percentage)*			
	100%-70%	*70%-30%*	*30%-10%*	*10%-2%*
Trees over 30m *Trees 10-30m* *Trees under 10m*	*Tall Closed Forest* *Closed Forest* *Low Closed Forest*	*Tall Open Forest* *Open Forest* *Low Open Forest*	*Tall Woodland* *Woodland* *Low Woodland*	*Tall Open Woodland* *Open Woodland* *Low Open Woodland*
Tree Mallee	*Closed Tree Mallee*	*Tree Mallee*	*Open Tree Mallee*	*Very Open Tree Mallee*
Shrub Mallee	*Closed Shrub Mallee*	*Shrub Mallee*	*Open Shrub Mallee*	*Very Open Shrub Mallee*
Shrubs over 2m *Shrubs 1-2m* *Shrubs under 1m*	*Closed Tall Scrub* *Closed Heath* *Closed Low Heath*	*Tall Open Scrub* *Open Heath* *Open Low Heath*	*Tall Shrubland* *Shrubland* *Low Shrubland*	*Tall Open Shrubland* *Open Shrubland* *Low Open Shrubland*
Grasses	*Closed Grassland*	*Grassland*	*Open Grassland*	*Very Open Grassland*
Herbs	*Closed Herbland*	*Herbland*	*Open Herbland*	*Very Open Herbland*
Sedges	*Closed Sedgeland*	*Sedgeland*	*Open Sedgeland*	*Very Open Sedgeland*

FIGURE 11: VIEW FROM THE SOUTHERN SIDE OF THE DRAINAGE LINE ACROSS THE BORROW PIT AREA FACING NORTH

FIGURE 12: VIEW ACROSS THE BARROW PIT AREA TOWARDS THE NORTH WEST

FIGURE 13: VIEW ACROSS THE BORROW PIT AREA TO THE WEST NORTH-WEST

FIGURE 14: VIEW OF THE GRASS TREE DOMINATED DRAINAGE CHANNEL

FIGURE 15: OPEN AREAS WITH PADDOCK GRASSES NEAR THE OPEN CHANNEL

FIGURE 16: CLUMPS OF ARUM LILY ARE COMMON IN THE DRAINAGE CHANNEL

FIGURE 17: VIEW DOWN THE MAIN DRAINAGE CHANNEL TOWARDS THE COAST

FIGURE 18: VIEW ACROSS THE NARROW SECTION OF DRAINAGE CHANNEL

FIGURE 19: DEAD GRASS TREE WITHIN THE DRAINAGE CHANNEL

FIGURE 20: VIEW TO THE NORTH ACROSS THE NARROW DRAINAGE CHANNEL

FIGURE 21: OPEN HEATHLAND NORTH-WEST OF THE SMALL TRACK NEAR THE PROPOSED DAM WALL

FIGURE 22: VIEW OF SCRUB/HEATH BELOW THE PROPOSED DAM WALL

Conservation status of flora

No plant species of conservation significance were observed on the site.

Vegetation condition

The vegetation within the drainage channel is considered to be in 'Good' or 'Degraded' condition based on the Keighery method in Bush Forever (1994) and outlined in the Bush Forever publication (2000).

Fauna values

The only areas proposed to be disturbed in the current proposal incorporate the minor drainage channel and a small amount of the vegetation on the north-western boundary. There are a number of mature willow peppermint trees on the southern portion of the lot that are likely to provide suitable habitat for Western Ringtail Possums. None of these trees will be affected by the current proposal and therefore no assessment was undertaken for this area.

Soil samples were taken along the open drainage channel and the samples sieved and examined for the presence of the Cape Leeuwin snail. Of all eight samples taken, only one contained a snail species and none contained the Cape Leeuwin Snail. The snail found at the one sample site was identified as an Oxychilus spp.

TABLE 3: SNAIL SAMPLIING

WAYPOINT	SAMPLE ID	SNAIL SPECIES	CAPE LEEUWIN SNAIL
159	Sample 1	✗	✗
160	Sample 2	✗	✗
161	Sample 3	✗	✗
162	Sample 4	✗	✗
177	Sample 5	✗	✗
178	Sample 6	✔	✗
179	Sample 7	✗	✗
180	Sample 8	✗	✗

FIGURE 23: BLACK COCKATOOS RANGING ACROSS THE SITE

FIGURE 24: CLOSER VIEW OF BLACK COCKATOOS

A flock of around 8 to 12 Black Cockatoos were observed flying immediately north of the remnant vegetation during the site visit of 15 November. The species was not determined at the time but they are most likely Baudin's Black Cockatoos.

Western grey kangaroos were observed on the site during both site visits.

Environmental Protection and Biodiversity Conservation Act database search

The Federal Government's EPBC Protected Matters Search database lists a number of species that are likely to be found in the local area (see Table 4).

TABLE 4: FAUNA SPECIES LIKELY TO BE FOUND IN THE LOCAL AREA (SOURCE: EPBC ACT PROTECTED MATTERS SEARCH DATABASE).

Scientific name	Common name	Wildlife Conservation Act status	EPBC Act status	Habitat available on site	Breeding likely on site
Apus pacificus	Fork tailed swift	-	Migratory	Species or habitat may occur	
Ardea alba	Great egret	-	Migratory	Species or habitat may occur	
Ardea ibis	Cattle egret	-	Migratory	Species or habitat may occur	
Botaurus poiciloptilus	Australian bittern		Endangered	Species or habitat may occur on the site	
Calyptorhynchus banksii naso	Forest Red-tailed Black-Cockatoo	Schedule 1	Vulnerable	Species or habitat may occur on the site	Possible
Calyptorynchus baudinii	Baudin's black cockatoo	Schedule 1	Vulnerable	Species or habitat may occur on the	Breeding known to occur in the

				site	area
Calyptorynchus latirostris	Carnaby's black cockatoo	Schedule 1	Endangered	Species or habitat may occur on the site	
Dasyurus geoffroii	Chuditch	Schedule 1	Vulnerable	Species or habitat may occur	
Diomedea exulans gibsoni	Gibson's Albatross	Schedule 1	Vulnerable	Species or habitat may occur	
Haliaeetus leucogaster	White bellied sea eagle		Migratory	Species or habitat may occur	
Macronectes giganteus	Southern Giant Petrel		Endangered	Species or habitat may occur	
Macronectes halli	Northern Giant Petrel		Vulnerable	Species or habitat may occur	
Merops ornatus	Rainbow bee eater	-	Migratory	Species or habitat may occur	
Pandion haliaetus	Osprey		Listed Marine Species	Species or species habitat known to occur within area	
Pseudocheirus occidentalis	Western ringtail possum	Schedule 1	Vulnerable	Species or habitat may occur	
Thalassarche cauta cauta	Shy Albatross		Vulnerable	Species or habitat may occur	

The Department of Agriculture provides a relative rating for the occurrence of a range of feral animals in the local area of the site. A similar rating is provided through the Federal Government's Environmental Protection and Biodiversity Conservation Act (EPBC Act) Protected Matters Report facility (Australian Government, 2018).

TABLE 5: FERAL ANIMALS LIKELY TO BE FOUND IN THE LOCAL AREA (SOURCE: EPBC PROTECTED MATTERS SEARCH TOOL).

Feral animal	Scientific name	Relative occurrence (WA Department of Agriculture)	Occurrence (Federal Government EPBC database)
Cats	*Felis catus*	Common	Species or species habitat likely to occur within area
Deer	*Cervus spp., Dama dama*	Occasional	
Dogs	*Canis familiaris*	Occasional	
Foxes	*Vulpes vulpes*	Occasional	Species or species habitat likely to occur within area
Pigs	*Sus scrofa*	Occasional	Species or species habitat likely to occur within area
Rabbits	*Oryctolagus cuniculus*	Common	Species or species habitat likely to occur within area

Conclusions and recommendations

This report outlines the findings of a number of daytime traverses of the area subject to clearing to observe flora and fauna species.

The area proposed for clearing is in a generally degraded condition and consists mostly of grass trees with a number of native rush species. The native plants co-exist with a number of introduced pasture grass species and some environmental weeds such as arum lily.

The drainage line consists of a relatively small drainage catchment and is likely to contain surface water running off for only a small part of the year, following heavy rainfall events. There is no open streamline or distinct drainage channel for running water. Based on the findings by the then Department of Environment and Conservation (2009), this is likely to mean that the site is not ideal habitat for the Cape Leeuwin Snail.

There are relatively few large shrubs or trees on the site and the only fauna observations were for Western Grey Kangaroos and Black Cockatoos. There are several wetlands and creek lines on nearby properties and these are likely to provide suitable habitat for the cockatoos ranging through the area.

Groves of marri and jarrah trees on adjacent properties have all developed a wind-pruned stunted form and therefore planting these species is not likely to provide additional roosting habitat to support local cockatoo populations. Willow peppermints seem to thrive in the local area and additional planting with this species is recommended, where appropriate. Existing trees should be retained and protected during the development process.

Dead grass trees on the site may be an indicator of the presence of dieback and precautions should be taken with movement of soils and hygiene/cleaning of equipment moving on and off the site.

The main impact of the development is on the visual appearance of the local area from the Cape to Cape walking track. Given that the drainage line is dominated by grass trees and knotted club rush, any clearing effort could be managed to dig out clumps of these species and put them aside for replanting on the new dam wall. Careful planning and management could result in a dam wall that is incorporated into the local landscape.

Feral animal management should be part of the ongoing land management activities of the owners.

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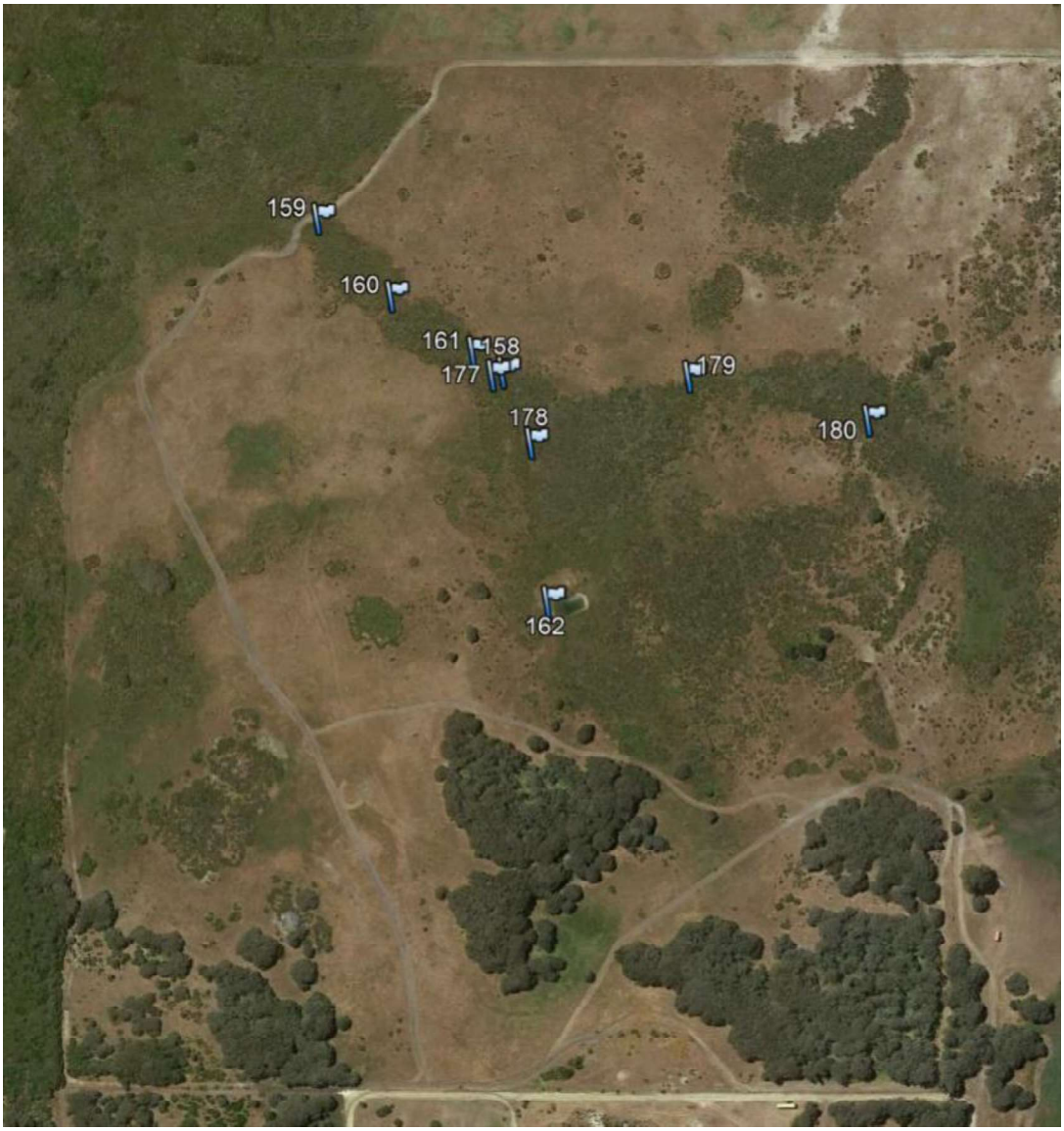
APPENDIX 1: WAYPOINTS AND AERIAL PHOTOGRAPHS OF LOCATIONS



Waypoint	Location	Observation
158	S33 45.327 E114 59.913	Highest point of narrow channel
159	S33 45.271 E114 59.831	Sample 1
160	S33 45.299 E114 59.864	Sample 2
161	S33 45.320 E114 59.900	Sample 3
162	S33 45.411 E114 59.933	Sample 4
177	S33 45.328 E114 59.908	Sample 5
178	S33 45.353 E114 59.925	Sample 6
179	S33 45.329 E114 59.994	Sample 7
180	S33 45.345 E115 00.072	Sample 8