



CLEARING PERMIT

Granted under section 51E of the Environmental Protection Act 1986

PERMIT DETAILS

Area Permit Number: CPS 9964/1
File Number: DWERVT11438
Duration of Permit: From 01 June 2023 to 01 June 2025

PERMIT HOLDER

4 Ways Pty Ltd

LAND ON WHICH CLEARING IS TO BE DONE

Lot 565 on Deposited Plan 420667, Inggarda

AUTHORISED ACTIVITY

The permit holder must not clear more than 43.25 hectares of *native vegetation* within the area cross-hatched yellow in Figure 1 of Schedule 1.

CONDITIONS

1. Period during which clearing is authorised

The permit holder must not clear any *native vegetation* after 01 June 2025.

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

In determining the *native vegetation* authorised to be cleared under this permit, the permit holder must apply the following principles, set out in descending order of preference:

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

3. Weed management

When undertaking any clearing authorised under this permit, the permit holder must take the following measures to minimise the risk of introduction and spread of *weeds*:

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

4. Directional clearing

The permit holder must conduct clearing activities in a slow, progressive manner towards adjacent *native vegetation* to allow fauna to move into adjacent *native vegetation* ahead of the clearing activity.

5. Records that must be kept

The permit holder must maintain records relating to the listed relevant matters in accordance with the specifications detailed in Table 1.

Table 1: Records that must be kept

No.	Relevant matter	Specifications
1.	In relation to the authorised clearing activities generally	<ul style="list-style-type: none"> (a) the species composition, structure, and density of the cleared area; (b) the location where the clearing occurred, recorded using a Global Positioning System (GPS) unit set to GDA2020, expressing the geographical coordinates in Eastings and Northings; (c) the date that the area was cleared; (d) the size of the area cleared (in hectares); (e) actions taken to avoid, minimise, and reduce the impacts and extent of clearing in accordance with condition 2; (f) actions taken to minimise the risk of the introduction and spread of <i>weeds</i> in accordance with condition 3; and (g) direction of clearing in accordance with condition 4.

6. Reporting

The permit holder must provide to the *CEO* the records required under condition 5 of this permit when requested by the *CEO*.

DEFINITIONS

In this permit, the terms in Table 2 have the meanings defined.

Table 2: Definitions

Term	Definition
CEO	Chief Executive Officer of the department responsible for the administration of the clearing provisions under the <i>Environmental Protection Act 1986</i> .
clearing	has the meaning given under section 3(1) of the EP Act.
condition	a condition to which this clearing permit is subject under section 51H of the EP Act.
fill	means material used to increase the ground level, or to fill a depression.
department	means the department established under section 35 of the <i>Public Sector Management Act 1994</i> (WA) and designated as responsible for the administration of the EP Act, which includes Part V Division 3.
EP Act	<i>Environmental Protection Act 1986</i> (WA)
mulch	means the use of organic matter, wood chips or rocks to slow the movement of water across the soil surface and to reduce evaporation.
native vegetation	has the meaning given under section 3(1) and section 51A of the EP Act.
weeds	means any plant – (a) that is a declared pest under section 22 of the <i>Biosecurity and Agriculture Management Act 2007</i> ; or (b) published in a Department of Biodiversity, Conservation and Attractions species-led ecological impact and invasiveness ranking summary, regardless of ranking; or (c) not indigenous to the area concerned.

END OF CONDITIONS



Mathew Gannaway

MANAGER

NATIVE VEGETATION REGULATION

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

2 May 2023

SCHEDULE 1

The boundary of the area authorised to be cleared is shown in the map below (Figure 1)

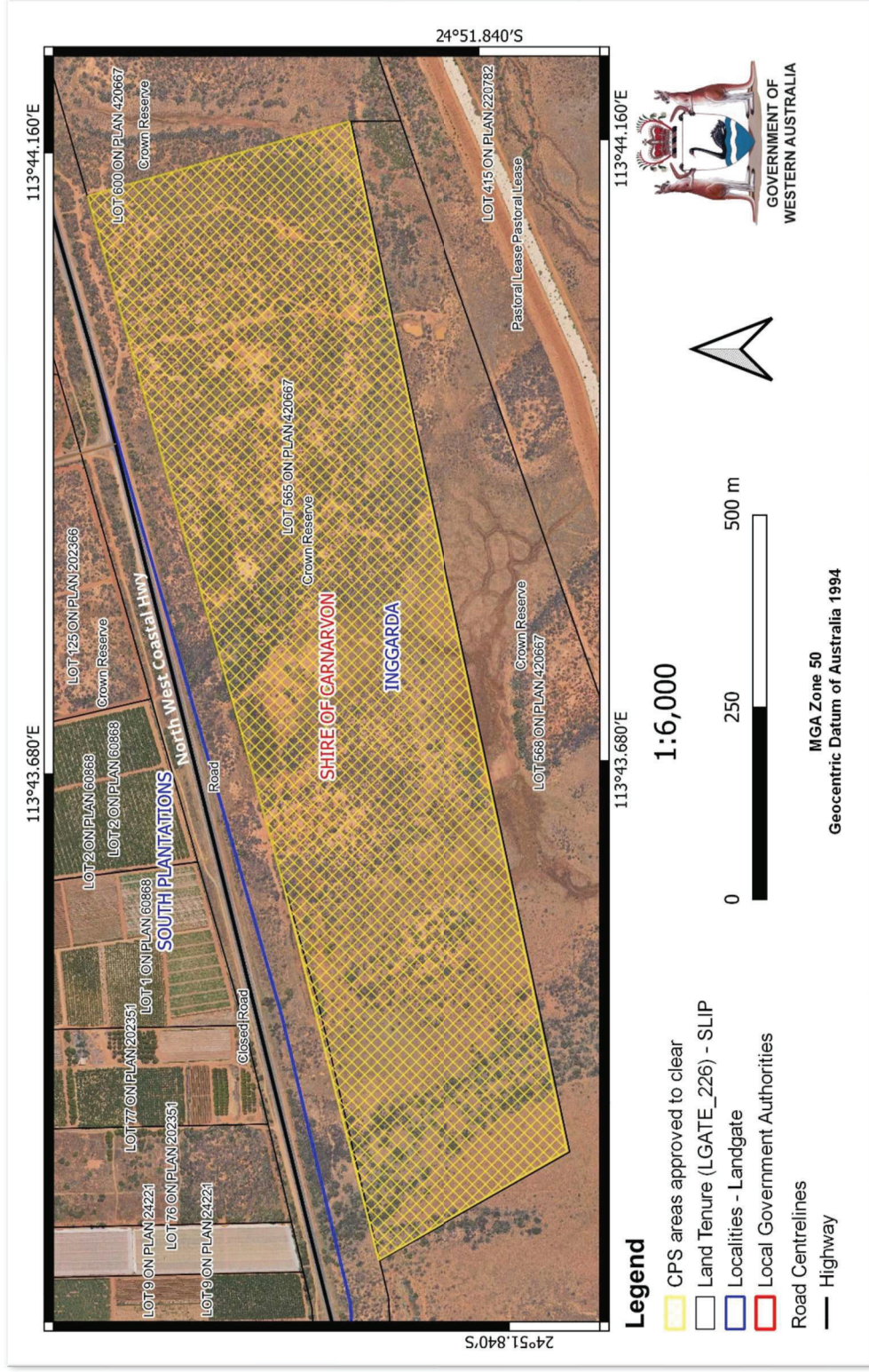


Figure 1: Map of the boundary of the area within which clearing may occur



Clearing Permit Decision Report

1 Application details and outcome

1.1. Permit application details

Permit number:	CPS 9964/1
Permit type:	Area permit
Applicant name:	4 Ways Pty Ltd
Application received:	18 November 2022
Application area:	43.25 hectares of native vegetation
Purpose of clearing:	Horticulture
Method of clearing:	Mechanical and burning
Property:	Lot 565 on Deposited Plan 420667, Inggarda
Location (LGA area/s):	Shire of Carnarvon
Localities (suburb/s):	Inggarda

1.2. Description of clearing activities

The area proposed to be cleared is 43.25 hectares of native vegetation contained within a single contiguous area, located on Lot 565 on Deposited Plan 420667, Inggarda (see Figure 1, Section 1.5). The proposed clearing is to enable conversion of the application area to arable land, for the initial production of a range of Asian vegetables predominantly for the Perth market, as well as new varieties of cherry and gourmet tomatoes into the future (4 Ways Pty Ltd, 2023).

1.3. Decision on application

Decision:	Granted
Decision date:	2 May 2023
Decision area:	43.25 hectares of native vegetation, as depicted in Section 1.5, below.

1.4. Reasons for decision

This clearing permit application was submitted, accepted, assessed and determined in accordance with sections 51E and 51O of the *Environmental Protection Act 1986* (EP Act). The Department of Water and Environmental Regulation (DWER) advertised the application for 21 days and no submissions were received.

In making this decision, the Delegated Officer had regard for the site characteristics (see Appendix A), relevant datasets (see Appendix E.1.), the findings of flora and vegetation surveys, a fauna survey (see Appendix D), land degradation advice provided by the Commissioner of Soil and Land Conservation (CSLC, 2023), the clearing principles set out in Schedule 5 of the EP Act (see Appendix B), relevant planning instruments and other matters considered relevant to the assessment (see Section 3.3). The Delegated Officer also took into consideration that the land is being purchased and developed for intensive horticulture, as part of the Western Australian Government's Gascoyne Foodbowl Project with the objective to expand the Carnarvon horticulture industry (4 Ways Pty Ltd, 2022).

The assessment identified that the proposed clearing may result in the following:

- may impact fauna utilising the application area at the time of clearing.

- may increase the risk of weeds spreading into adjacent vegetation, which could impact on the quality of the adjacent vegetation and its habitat values.

After consideration of the available information, as well as the applicant's avoidance and minimisation measures (Section 3.1), the Delegated Officer considered that with appropriate management conditions, the proposed clearing is not likely to lead to an unacceptable risk to the environment. The Delegated Officer decided to grant a clearing permit subject to conditions to:

- avoid, minimise and reduce the impacts and extent of clearing.
- implement suitable weed management practices that are appropriate to mitigate the impact of spreading weeds into adjacent vegetation.
- undertake slow, progressive, one directional clearing to allow terrestrial fauna to move into adjacent habitat ahead of the clearing activity.



Clearing Permit Decision Report

1.5. Site map

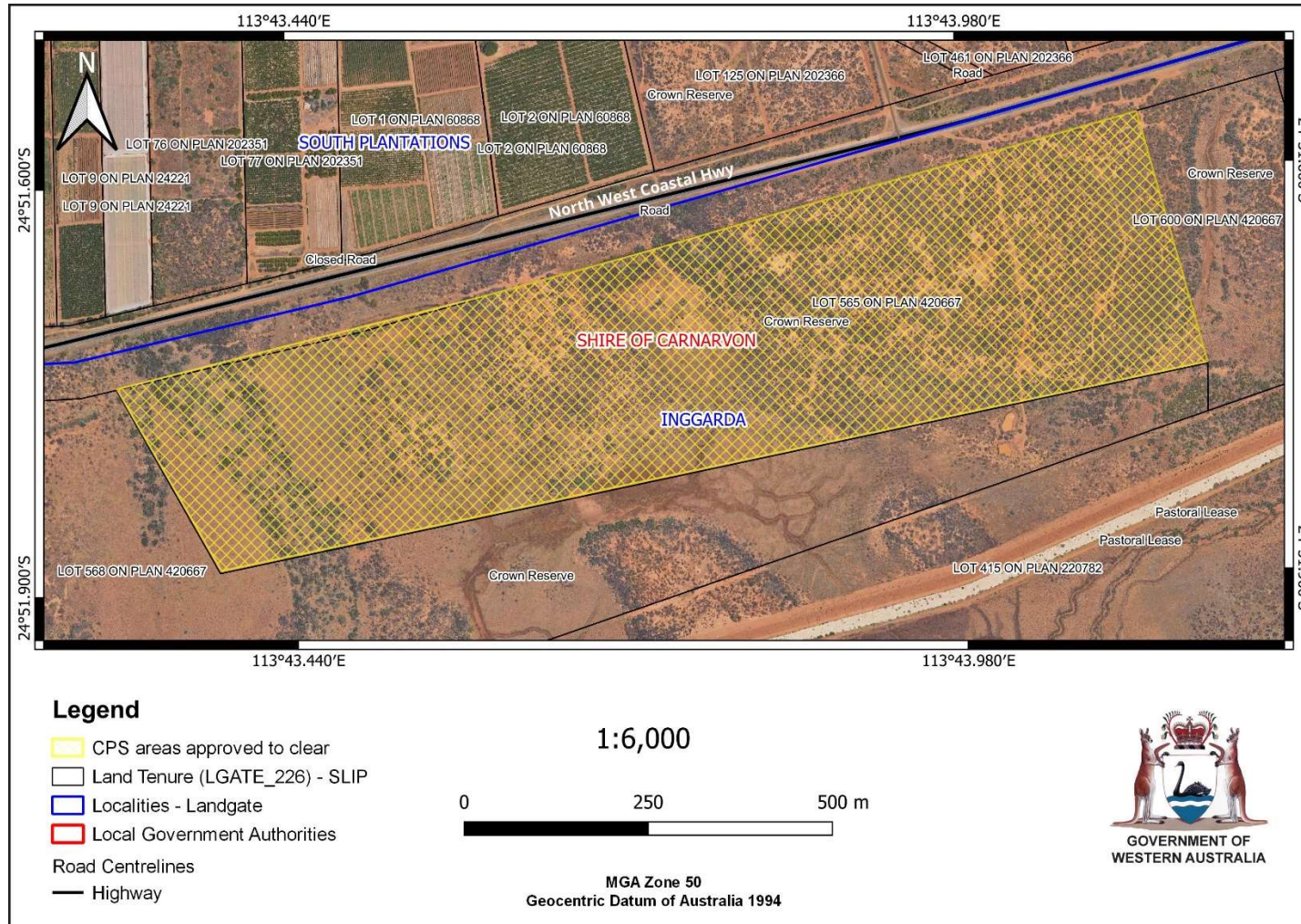


Figure 1: Map of the application area CPS 9964/1. The area crosshatched yellow indicates the area authorised to be cleared under the granted clearing permit.



Clearing Permit Decision Report

2 Legislative context

The clearing of native vegetation in Western Australia is regulated under the EP Act and the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004* (Clearing Regulations).

In addition to the matters considered in accordance with section 51O of the EP Act (see Section 1.4), the Delegated Officer has also had regard to the objects and principles under section 4A of the EP Act, particularly:

- the precautionary principle
- the principle of intergenerational equity
- the principle of the conservation of biological diversity and ecological integrity.

Other legislation of relevance for this assessment include:

- *Biodiversity Conservation Act 2016* (WA) (BC Act)
- *Conservation and Land Management Act 1984* (WA) (CALM Act)
- *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act)
- *Planning and Development Act 2005* (WA) (P&D Act)
- *Soil and Land Conservation Act 1945* (WA).

The key guidance documents which inform this assessment are:

- *A guide to the assessment of applications to clear native vegetation* (DER, December 2013)
- *Procedure: Native vegetation clearing permits* (DWER, October 2019)
- Technical guidance – *Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA, 2016)
- Technical guidance – *Terrestrial Fauna Surveys for Environmental Impact Assessment* (EPA, 2016).

3 Detailed assessment of application

3.1. Avoidance and mitigation measures

The applicant did not provide any avoidance and mitigation measures in support of the application. The applicant advised that the entire area will be developed for intensive horticulture (4 Ways Pty Ltd, 2022).

3.2. Assessment of impacts on environmental values

In assessing the application, the Delegated Officer has had regard for the site characteristics (see Appendix A) and the extent to which the impacts of the proposed clearing present a risk to biological, conservation, or land and water resource values.

The assessment against the clearing principles (see Appendix B) identified that the impacts of the proposed clearing may present a risk to conservation significant fauna. The consideration of these impacts, and the extent to which they can be managed through conditions applied in line with sections 51H and 51I of the EP Act, is set out below.

3.2.1. Environmental values (flora) - Clearing Principle (a)

Assessment

According to available databases nine priority flora species have been recorded within the local area (50 kilometre radius from the application area). The vegetation and/or soils present within the application area have the potential to provide suitable habitat for the following species (Appendix A.3.):

- *Abutilon* sp. Quobba (H. Demarz 3858) (P2)
- *Chthonocephalus tomentellus* (P2)
- *Schoenia filifolia* subsp. *arenicola* (P1)
- *Sporobolus blakei* (P3)
- *Rumex crystallinus* (P2)

A total of six vegetation types were recorded within the Carnarvon horticulture expansion survey area of 921.6 hectares. Three vegetation types, ASL (1) Acacia shrubland, CDSL (6) Chenopodium and Duma shrubland and CSL (4) Chenopod shrubland were recorded within the application area (Appendix D: Table 2 and Figure 4). The condition

of this vegetation was given a quality score of 2 – pristine or nearly so and 3 – shows signs of disturbance, as the structure of the vegetation has been altered from ongoing disturbance from livestock and human activities (Strategen, 2017; see Appendix C: Table 1 – Vegetation condition rating scale, Appendix D: Figure 5 - map).

One priority flora species, *Corchorus congener* (P3), was potentially recorded during the survey. Subsequent review of the specimen confirmed that the record was an *Acacia sp.*, and not *Corchorus congener* (P3) as initially thought (Strategen, 2017). No threatened or priority flora species were recorded during the surveys (Strategen, 2017; 2019; Strategen-JBS&G, 2020). The surveys were completed during the prime flowering time for the majority of the conservation significant species potentially occurring within the survey area (Strategen, 2017; 2019; Strategen-JBS&G, 2020). The survey was not undertaken at an optimal time for *Abutilon sp. Quobba* (H. Demarz 3858) (P2), which flowers between July to September. However, the soil type preferred by this species is sandplain, and along dune ridges (Western Australian Herbarium, 1998-), which is not present within the application area. It is not likely that the application area contains habitat for this species. If present, the remaining above-listed priority flora species would have likely been identified at the time of the survey if found within the application area. It is not likely that the proposed clearing will significantly impact on habitat availability of conservation significant species that may be present within the local area.

Conclusion

Based on the above, the Delegated Officer determined that the proposed clearing is not likely to impact on vegetation that is significant habitat for flora species, or impact on an area that contains high biodiversity, due to the extensive habitat available to the south and east of the application area.

Conditions

No flora management conditions are required.

3.2.2. Environmental values (fauna) - Clearing Principles (a and b)

Assessment

Desktop Analysis

Coastal and wetland birds

The majority (54 taxon) of the conservation significant fauna species recorded in the local area (50 kilometre radius of the application area) have been recorded as being migratory wetland and shore birds (see Appendix A.4). The McNeill Claypan is known to support a range of migratory water birds during long periods of inundation following heavy rains, or as a result of Gascoyne River flood events. The application area is mapped as Gascoyne Marshes 308, which was confirmed in Strategen's 2019 report (Strategen, 2019). This vegetation does not indicate wetland or riparian vegetation, therefore the application area is unlikely to provide significant habitat for migratory wetland and shore birds species. In addition, the McNeil Levee bank that borders the application area to the south and east, now limits the water that enters the application area during flood events, further reducing the suitability of this area as a habitat for migratory birds.

Terrestrial birds

An additional three conservation significant birds were recorded in the local area.

Amytornis textilis textilis (Western grasswren) was once distributed across southern western Australia and is now confined to the Shark Bay region (DEH, 2006). Since 1910 this species has retracted in its range considerably (over 90 per cent), most likely due to over grazing (DEH, 2006). It is unlikely this species will be impacted by the proposed clearing.

There are three records for *Leipoa ocellata* (malleefowl) in the local area. These sightings are undated and have been on record since before 1984 (Benshemesh, 2007). Over the past century Malleefowl has contracted its range particularly in arid areas, and since 1981 Malleefowl has further contracted its range by 28 percent in Western Australia (Benshemesh, 2007). Given that Malleefowl has not been recorded in the local area for approximately 40 years, it is unlikely this species will be impacted by the proposed clearing.

Two birds of prey, *Falco peregrinus* (Peregrine falcon) and *Falco hypoleucos* (Grey falcon) have also been recorded within the local area. These species may also utilise the application area for foraging prey such as small birds or mammals. However, given the land to the south and east of the application area is adjoined by a large expanse of relatively undisturbed native vegetation, the proposed clearing is unlikely to significantly impact the available foraging habitat for the above species.

Other conservation significant Fauna

Egernia stokesii badia (western spiny-tailed skink) is associated with arid low heath with areas of *Spinifex longifolius* and is known to shelter in fallen logs and under loose sheets and boulders of limestone and in crevices formed by solution erosion of caprock (DEC, 2012b). It is noted that the application area may comprise some elements of the known habitat for this species. Western spiny-tailed skink has been recorded from a cluster of three records occurring approximately 35 kilometres southwest from the application area. This species has also retracted in its range (DEC, 2012b) and records in the local area represent the most northerly extreme of the species distribution (DEC, 2012b), therefore it is unlikely occur within the application area.

Idiosoma incomptum (Carnarvon shield-backed trapdoor spider) is known from three records, in generally undisturbed vegetation. According to the known distribution of this species, the records occurring within the local area represent the western edge of the population range for this species (Rix *et al.* 2019). The above records occur within floodplains with associated sandy soils and alluvial plains. Soils mapped within the application area are composed of reddish-brown earthy loams. The ground layer vegetation proposed to be cleared is dominated by buffel grass, which is an aggressive introduced grass that tends to cover the ground with dense tussocks, unsuitable for the Carnarvon shield-backed trapdoor spider.

Fauna Survey

A fauna assessment report was submitted by the applicant that reported on the desktop and survey findings of field investigations that were undertaken by Bamford Consulting Ecologists from the 7 to 15 November 2016. The sampling sites were located throughout the Carnarvon horticulture expansion area, four of which were located within the application area for CPS 9964/1 (Pitfall traps - Site 5-1, 5-10, 6-1 and 6-10, as well as two motion sensitive camera locations in the application area) (Appendix D: Figure 6) (Bamford Consulting Ecologists, 2017). A summary of the findings of the fauna survey is below.

Leipoa ocellata (Malleefowl) (VU)

The Malleefowl is known from mallee eucalypt woodlands, and dense *Acacia* shrublands. No mounds were recorded during the field survey. Carnarvon represents the northern limit of this species' distribution. Several historical records around Carnarvon are over 100 years old according to database searches. The closest recent recorded mounds are located approximately 200 kilometres south, from the Shark Bay area (Bamford Consulting Ecologists, 2017 and mapped on the Atlas of Living Australia). Some areas of *Acacia* thicket (Vegetation substrate association (VSA) 2 – approximately 3 kilometres north of the application area) within the survey area represent potentially suitable vegetation. However the low elevation, alluvial topography and fine clay substrate, lacking gravel or pebble, is not considered as a marginal or non-preferred area for nest mounds. Due to the northerly location of the survey area, the Malleefowl is considered to occur rarely as a vagrant (Bamford Consulting Ecologists, 2017).

Pandion cristatus (eastern osprey) (MI)

A common and widespread coastal species that also occurs along estuarine and riparian near-coastal areas. It was recorded along the Gascoyne River during the survey and is likely to nest locally in power poles or other tall infrastructure. The survey area lacks suitable open water for hunting and tall nesting structures, but due to local occurrence, the species is considered to be an irregular visitor (Bamford Consulting Ecologists, 2017).

Falco peregrinus (Peregrine falcon) (OS/MI)

This species is known to occur over a wide range of environments across Australia. Preferred nesting locations include a range of elevated locations with steep bisected topography such as rocky hills, breakaways, cliffs and high artificial structures. They will also nest in very large, horizontally-aligned tree hollows, and in old Raven nests in tall trees (Bamford Consulting Ecologists, 2017). The survey area lacks elevated landscapes and tall trees, and is marginal nesting habitat at best, but provides habitat for hunting (Bamford Consulting Ecologists, 2017).

Falco hypoleucos Grey Falcon (VU)

This species has an extensive but sparse distribution through much of northern Australia. It has been recorded in the wider Carnarvon area including along the Gascoyne River. The *Acacia* dominated shrublands and woodlands within the project area is potential habitat and proximity to Gascoyne River means that this species potentially visits the site on at least an irregular basis (Bamford Consulting Ecologists, 2017).

Hirundo rustica (barn swallow) (MI)

This species is regular in small numbers as a non-breeding summer migrant across northern Australia, and often occurs in association with man-made structures. It has previously been recorded in the Carnarvon region.

Migratory Waterbirds

This group includes an ibis, two egrets, two terns, and 32 waders (shorebirds) listed as Migratory under federal and/or state legislation and known to occur in the region. A number of species in this group were recorded outside the survey area but within the wider Carnarvon region and are included due to their potential local occurrence in claypan areas located in close proximity to the survey area, particularly near sites 3 and 4, which are located approximately 3 kilometres north of the application area (Appendix D: Figure 6). These local claypans are extensive and expected to flood occasionally, providing shallow foraging habitat for a range of wetland species, any of which may occur as vagrants (Bamford Consulting Ecologists, 2017).

Amytornis textilis textilis (western grasswren) (P4)

This species is rare and has a patchy distribution restricted to the Carnarvon Basin area from Shark Bay north to about Exmouth. Whilst not expected to be a resident species of the survey area, it may visit due to local occurrence around Carnarvon and available open Acacia shrub land and grassy habitats in the application area (Bamford Consulting Ecologists, 2017).

Conclusion

Although recorded in the local area, a number of conservation significant species have since retracted from the local area. Therefore, the proposed clearing is unlikely to impact available habitat for these species. Due to unsuitable soil conditions and the dominance of buffel grass, the application area is unlikely to provide habitat for the Carnarvon shield-backed trapdoor spider. Barn swallow, fork-tailed swift, Peregrine falcon and grey falcon may utilise the application area for foraging and hunting prey, however, given the extent of relatively undisturbed vegetation in adjacent areas, the proposed clearing is unlikely to significantly reduce available feeding habitat.

Based on the above assessment, it is unlikely the clearing will significantly impact conservation significant fauna. The potential direct impact to fauna present at the time of clearing may be managed by the implementation of a fauna management condition of directional clearing. Weed management will also assist in ensuring that the adjacent fauna habitat is not impacted by the proposed clearing.

Conditions

To address the above impacts, the following management measures will be required as conditions on the clearing permit:

- Clearing shall be undertaken in a slow, progressive manner in one direction to allow terrestrial fauna to move into adjacent habitat ahead of the clearing activity.
- Implement weed management measures to mitigate impacts to adjacent vegetation.

3.3. Relevant planning instruments and other matters

The Shire of Carnarvon advised DWER that local government approvals are required, and that the proposed clearing is consistent with the Shire's Local Planning Scheme No. 13. The Shire did not have any objections to the proposed clearing (Shire of Carnarvon, 2023a). The Shire advised:

- The subject land is zoned 'Priority Agriculture' with the main objectives to:
 - o Identify land of State, regional or local significance for food production purposes;
 - o Retain priority agricultural land for agricultural purposes;
 - o Limit the introduction of sensitive land uses that may compromise existing, future or potential agricultural production;
 - o Protect and enhance wetlands and other ecological sensitive areas.
- A Development Approval has been issued for Lot 565 on Deposited Plan 420667, Inggarda, for the development of packing sheds and a cool room (Shire of Carnarvon, 2023b).

Current databases indicated that a DWER-owned groundwater monitoring bore L21/ref ID 70418329 was located within the proposed application area. Advice received from the Mid-West Gascoyne Measurement team has confirmed that this bore is no longer functional, and as a result, will not have any implications on the clearing of native vegetation on the property (DWER, 2023b).

The application area is located within the Gascoyne and Lyons River Aboriginal Heritage Site (Place ID: 39200 - Ceremonial, Mythological, Water Source). It is the permit holder's responsibility to comply with the Aboriginal Heritage Act 1972 (WA) and ensure that no Aboriginal Sites of Significance are damaged through the clearing process.

End

Appendix A. Site characteristics

The information provided below describes the key characteristics of the area proposed to be cleared and is based on the best information available to DWER at the time of this assessment. This information was used to inform the assessment of the clearing against the Clearing Principles, contained in Appendix B.

A.1. Site characteristics

Characteristic	Details
Local context	<p>The area proposed to be cleared is 43.25 hectares of native vegetation along North West Coastal Highway, approximately five kilometres east of Carnarvon town centre in Western Australia. North of the highway, the land use is intensive horticulture and otherwise the application area is surrounded by crown reserves and pastoral leases.</p> <p>Based on aerial imagery, the application area is surrounded by vegetation of similar condition and extent. The area proposed to be cleared is located within the extensive land use zone of Western Australia. Available data indicates the local area (50 kilometre radius of the application area, excluding the ocean) retains approximately 98.53 percent of the original native vegetation cover.</p>
Ecological linkage	<p>The application area does not occur within any mapped ecological linkages. The application area is connected to adjacent native vegetation at its western, southern and eastern boundary. The majority of the vegetation within the local area is relatively undisturbed, with little to no fragmentation.</p>
Conservation areas	<p>The parcel of land directly adjacent to the south and west of the application area is part of a larger conservation reserve vested with the Shire of Carnarvon, conserved in perpetuity since December 2004 (R 46623).</p> <p>One Tree Point Reserve and Chinaman's Pool Nature Reserves occur at 6.9 and 4.3 kilometres respectively west of the application area. The proposed clearing will not impact these reserves.</p>
Vegetation description	<p>A vegetation survey conducted by Strategen (2019) indicates the vegetation within the application area is <i>Acacia</i> shrubland, described as:</p> <ul style="list-style-type: none"> ASL (1): Tall Sparse to Open Shrubland of <i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i> and / or <i>Acacia synchronicia</i> with a Sparse to Open Shrubland of <i>Rhagodia eremaea</i> and <i>Alectryon oleifolius</i> subsp. <i>oleifolius</i> and an Open Tussock Grassland of <i>Cenchrus ciliaris</i> (buffel grass) and / or <i>Chloris pumilio</i>. <p>This vegetation type is consistent with the mapped Beard vegetation association Gascoyne Marshes 308, which is described as:</p> <ul style="list-style-type: none"> Mosaic: Shrublands; <i>Acacia sclerosperma</i> sparse scrub / Succulent steppe; saltbush & bluebush (Shepherd et al., 2001). <p>The mapped Beard vegetation association retains approximately 99.22 per cent of the original extent (Government of Western Australia, 2019).</p>
Vegetation condition	<p>The vegetation survey conducted by Strategen (2019) assessed the application area with a vegetation condition score of 2 'pristine or nearly so' and 3 'shows signs of disturbance' (Strategen, 2019). A map showing the distribution of these ratings can be found in Appendix D Figure 5. These vegetation condition scale used by Strategen was based on the Eremaean and Northern Botanical Provinces indicated in EPA and Parks and Wildlife (2015) and shown in Appendix D: Table 2.</p>
Climate and landform	<p>Carnarvon experiences an arid climate with an average annual rainfall of 224.6 millimetres. Rainfall may occur at any time of year; however, most occurs in winter. Highest temperatures occur between December and April, with average monthly maximums ranging from 29.1 degrees celsius in April to 32.6 degrees celsius in February (BOM, 2016). Lowest temperatures occur between June and August, with average monthly minimums ranging from 10.9 degrees celsius in July to 12.3 degrees celsius in June (BOM, 2017). Evapotranspiration is on average 300 millimetres per annum.</p>
Soil description	<p>According to available mapping databases, the application area lies within four soil subsystems:</p>

Characteristic	Details
	<ul style="list-style-type: none"> - 235Ri_3 - River clayey terrace Subsystem (7.55 percent) - Level alluvial plain developed on the upper terraces of the Gascoyne River and carrying acacia shrubland with an understorey including buffel grass (<i>Cenchrus ciliaris</i>). Saltbush species are usually absent from the subsystem. - 235De_6 - Delta claypan Subsystem (49.84 percent) - Slight depressions on the floodplain consisting of circular salt lakes and drainage foci that are predominantly bare of vegetation. Some claypans may carry few annual grasses, annual saltbush or Gascoyne bluebush (<i>Maireana polypterygia</i>). - 235De_2 - Delta bluebush flat Subsystem (33.75 percent) - Plains carrying scattered to very scattered low (0.8-1.2 m high) shrubland dominated by Gascoyne bluebush (<i>Maireana polypterygia</i>). Dominant soils belong to the Coburn and Moyamber associations. - 235Cg_3 - Chargoo gilgai Subsystem (8.86 percent) - Swampy drainage depressions, with cracking clays, saltbush and common gilgai microrelief. <p>Local advice was received from the Commissioner of Soil and Land Conservation (CSLC) informing the assessment that the application area is located on the alluvial terraces and backplains of the Delta and River Land System. The Delta and River Land System is described as level to gently inclined alluvial plains with minor clay drainage depressions and small saline scalds. The vegetation is mainly Acacia shrublands or open shrublands (CSLC, 2023). Soils are predominantly medium textured Gascoyne soils with secondary heavy textured Gascoyne soils and range from clayey fine sands to loam within the topsoil. Subsoils are commonly loam to clay loam with low to high levels of salt (CSCL, 2023)</p>
Land degradation risk	<p>The application area occurs within the Nickol Bay levee and thus it is largely protected from flooding events. Waterlogging, inundation, and salinity are the main limitations that may impact the land once cleared and developed for horticulture. There is some risk of land degradation (waterlogging, salinity and inundation) if cleared of vegetation. However, these risks are manageable using standard soil conservation measures which include levelling and grading the site (CSLC, 2023).</p>
Waterbodies	<p>Available mapping databases indicate that the Directory of Important Wetlands in Australia (DBCA-045) - McNeill Claypan System covers the majority of the application area, however, this mapping is unlikely to represent the true on ground hydrography due to the construction of the Nickol Bay levee bank. The Preliminary Report assessing the 2021 Gascoyne River flood at Carnarvon, shows the Lot is protected by the Nickol Bay levee (DWER, 2021). The levee bank significantly reduces the volume of water that will flow through the application area (CSLC, 2023).</p>
Hydrogeography	<p>The application area is mapped within the Gascoyne River and Tributaries Surface Water Area, and the Gascoyne Groundwater Area, both proclaimed under the RIWI Act. The application area is not located within any Public Drinking Water Source Areas. The lot is located downstream approximately 7.8 kilometres west of the priority one public drinking water source area.</p>

Characteristic	Details
Flora	<p>According to available databases, the following conservation significant flora have been recorded within the local area (50 kilometre radius from the application area):</p> <ul style="list-style-type: none"> • Fourteen flora species listed as Priority by DBCA; and • No records of flora species listed as threatened under the BC Act. <p>According to available databases and surveys undertaken by Strategen, no Threatened flora species as listed Threatened under the EPBC Act or BC Act and as listed by Parks and Wildlife (2015) were recorded within the survey area. A large portion of vegetation within the survey area has experienced modification due to historical land use including clearing and cattle grazing over the area (Strategen, 2019). During the survey, one Priority flora species (<i>Corchorus congener</i> [P3]) as listed by Western Australian Herbarium (1998-) was potentially recorded within the application area (Strategen, 2019). Subsequent review of the specimen determined that it is likely an <i>Acacia</i> sp. A targeted survey was only undertaken over the additional areas (2019 survey areas), no conservation significant flora species were recorded (Strategen-JBS&G, 2020).</p>
Ecological communities	No known threatened or priority ecological communities (TEC or PEC) occur within the application area. The closest TEC or PEC is the Subtropical and Temperate Coastal Saltmarsh listed as 'Priority 3' by DBCA and 'Vulnerable' under the EPBC Act, mapped approximately 5.8 kilometres west of the application area.
Fauna	<p>According to available databases, 68 conservation significant fauna species have been recorded within the local area (50 kilometre radius of the application area). The boundary of the local area overlaps the ocean, Gascoyne River (including the river mouth), and wetlands listed in the directory of important wetlands in Western Australia. Forty-five bird species recorded within the local area are classified as migratory species, so are likely to frequent the area only in the case it is inundated with water, which is now quite unlikely due to the installation of the levee bank in 2015 (DWER, 2021).</p> <p>Eight of the recorded fauna species are exclusively associated with marine, estuarine or freshwater habitats that do not occur within the application area.</p> <p>Noting the habitat requirements, distribution of the recorded species, the vegetation type and condition within the application area, the application area may comprise suitable habitat for several species as described in Section 3.2.2 of this report.</p>

A.2. Vegetation extent

	Pre-European extent (ha)	Current extent (ha)	Extent remaining (%)	Current extent in all DBCA managed land (ha)	Current proportion (%) of pre-European extent in all DBCA managed land
IBRA bioregion**					
<i>Carnarvon</i>	8,382,890.35	8,360,801.46	99.74	12.14	12.17
Beard vegetation association *					
<i>Gascoyne Marshes_308</i>	445,197.57	441,704.55	99.22	0.87	0.87
Local area					
<i>50km radius from application area</i>	487,255.06	480,083.70	98.53	-	-

*Government of Western Australia (2019)

A.3. Flora analysis table

With consideration for the site characteristics set out above, relevant datasets (see Appendix E.1.), the flora and vegetation survey information (Strategen, 2017; 2019), impacts to the following conservation significant flora required further consideration.

Species name	Conservation status	Suitable vegetation type? [Y/N]	Suitable soil type? [Y/N]	Distance of closest record to application area (km)	Number of known records (total)	Are surveys adequate to identify? [Y, N, N/A]
<i>Abutilon sp. Quobba</i> (H. Demarz 3858)	Priority 2	Yes	No	2.58	5	No
<i>Chthonocephalus tomentellus</i>	Priority 2	No	Yes	5.99	3	Yes
<i>Rumex crystallinus</i>	Priority 2	No	Yes	4.00	1	Yes
<i>Schoenia filifolia subsp. arenicola</i>	Priority 1	No	Yes	2.10	3	Yes
<i>Sporobolus blakei</i>	Priority 3	No	Yes	6.59	1	Yes

A.4. Fauna analysis table

Species name	Conservation status	Suitable habitat features? [Y/N]	Suitable vegetation type? [Y/N]	Distance of closest record to application area (km)	Number of known records (total)	Are surveys adequate to identify? [Y, N, N/A]
<i>Actitis hypoleucos</i> (common sandpiper)	MI	No	No	0.38	412	Y
<i>Amytornis textilis textilis</i> (western grasswren, thick-billed grasswren (western))	P4	Yes	Yes	26.79	1	Y
<i>Apus pacificus</i> (fork-tailed swift)	MI	Yes	Yes	5.88	2	Y
<i>Apus pacificus</i> (fork-tailed swift, Pacific swift)	MI	Yes	Yes	5.88	5	Y
<i>Ardenna carneipes</i> (flesh-footed shearwater, fleshy-footed shearwater)	VU/MI	No	No	42.52	1	Y
<i>Ardenna pacifica</i> (wedge-tailed shearwater)	MI	No	No	42.52	1	Y
<i>Arenaria interpres</i> (ruddy turnstone)	MI	No	No	1.81	59	Y
<i>Botaurus poiciloptilus</i> (Australasian bittern)	EN/MI	No	No	42.52	1	Y
<i>Branchinella denticulata</i> (a fairy shrimp (Carnarvon to Kalgoorlie))	P3	No	No	42.33	1	Y
<i>Branchinella denticulata</i> (a fairy shrimp (Carnarvon to Kalgoorlie))	P3	No	No	42.48	1	Y
<i>Branchinella wellardi</i> (a fairy shrimp (Carnarvon and Murchison))	P3	No	No	43.68	3	Y
<i>Calidris acuminata</i> (sharp-tailed sandpiper)	MI	No	No	0.28	138	Y
<i>Calidris alba</i> (sanderling)	MI	No	No	3.65	66	Y
<i>Calidris canutus</i> (red knot)	EN/MI	No	No	4.81	99	Y
<i>Calidris ferruginea</i> (curlew sandpiper)	CR/MI	No	No	0.46	162	Y
<i>Calidris melanotos</i> (pectoral sandpiper)	MI	No	No	4.70	4	Y
<i>Calidris ruficollis</i> (red-necked stint)	MI	No	No	0.28	288	Y
<i>Calidris subminuta</i> (long-toed Stint)	MI	No	No	0.28	50	Y
<i>Calidris tenuirostris</i> (great knot)	CR/MI	No	No	2.59	132	Y
<i>Caretta caretta</i> (loggerhead turtle)	EN	No	No	5.88	4	Y
<i>Charadrius dubius</i> (little Ringed Plover)	MI	No	No	2.59	7	Y
<i>Charadrius leschenaultii</i> (greater sand plover, large sand plover)	VU/MI	No	No	0.58	219	Y
<i>Charadrius mongolus</i> (lesser sand plover)	EN/MI	No	No	3.65	54	Y
<i>Charadrius veredus</i> (oriental Plover)	MI	No	No	11.14	8	Y
<i>Chelonia mydas</i> (green turtle)	VU	No	No	5.88	4	Y

Species name	Conservation status	Suitable habitat features? [Y/N]	Suitable vegetation type? [Y/N]	Distance of closest record to application area (km)	Number of known records (total)	Are surveys adequate to identify? [Y, N, N/A]
<i>Chlidonias leucopterus</i> (white-winged black tern, white-winged tern)	MI	No	No	1.46	11	Y
<i>Dugong dugon</i> (dugong)	OS	No	No	9.08	2	Y
<i>Egernia stokesii badia</i> (western spiny-tailed skink)	VU/EN	No	Yes	35.13	3	Y
<i>Falco hypoleucos</i> (grey falcon)	VU	Yes	Yes	2.05	5	Y
<i>Falco peregrinus</i> (peregrine falcon)	OS/MI	Yes	Yes	0.58	15	Y
<i>Fregata ariel</i> (lesser frigatebird)	MI	No	No	15.58	2	Y
<i>Gelochelidon nilotica</i> (gull-billed tern)	MI	No	No	0.58	82	Y
<i>Glareola maldivarum</i> (oriental pratincole)	MI	No	No	0.58	12	Y
<i>Hirundo rustica</i> (barn swallow)	MI	Yes	Yes	1.59	1	Y
<i>Hydroprogne caspia</i> (Caspian tern)	MI	No	No	0.64	303	Y
<i>Idiosoma incomptum</i> (Carnarvon shield-backed trapdoor spider)	P3	Yes	Yes	3.93	3	Y
<i>Lagostrophus fasciatus fasciatus</i> (banded hare-wallaby, mernine)	VU	No	No	5.88	1	Y
<i>Leipoa ocellata</i> (malleefowl)	VU	Yes	Yes	21.23	3	Y
<i>Limicola falcinellus</i> (broad-billed sandpiper)	MI	No	No	8.07	6	Y
<i>Limnodromus semipalmatus</i> (Asian dowitcher)	MI	No	No	7.01	8	Y
<i>Limosa lapponica</i> (bar-tailed godwit)	MI	No	No	1.81	288	Y
<i>Limosa lapponica menzbieri</i> (bar-tailed godwit (northern Siberian))	CR/MI	No	No	5.84	2	Y
<i>Limosa limosa</i> (black-tailed godwit)	MI	No	No	4.48	27	Y
<i>Macronectes giganteus</i> (southern giant petrel)	MI/EN	No	No	5.37	2	Y
<i>Megaptera novaeangliae</i> (humpback whale)	CD/VU	No	No	5.88	2	Y
<i>Numenius madagascariensis</i> (eastern curlew)	CR/MI	No	No	1.81	203	Y
<i>Numenius minutus</i> (little curlew, little whimbrel)	MI	No	No	2.29	18	Y
<i>Numenius phaeopus</i> (whimbrel)	MI	No	No	1.81	207	Y
<i>Oceanites oceanicus</i> (Wilson's storm-petrel)	MI	No	No	42.52	3	Y
<i>Pandion cristatus</i> (osprey, eastern osprey)	MI	No	No	1.81	82	Y
<i>Parartemia contracta</i> (a brine shrimp (Wheatbelt))	P1	No	No	42.48	1	Y
<i>Phaethon rubricauda</i> (red-tailed tropicbird)	P4/MI	No	No	42.52	1	Y
<i>Philomachus pugnax</i> (ruff (reeve))	MI	No	No	2.59	9	Y
<i>Plegadis falcinellus</i> (glossy ibis)	MI	No	No	0.46	88	Y
<i>Pluvialis fulva</i> (Pacific golden plover)	MI	No	No	4.78	43	Y
<i>Pluvialis squatarola</i> (grey plover)	MI	No	No	2.96	173	Y
<i>Rostratula australis</i> (Australian painted snipe)	EN/MI	No	No	0.58	29	Y
<i>Sterna dougallii</i> (roseate tern)	MI	No	No	6.01	7	Y
<i>Sterna hirundo</i> (common tern)	MI	No	No	6.64	19	Y
<i>Sternula albifrons</i> (little tern)	MI	No	No	1.68	9	Y
<i>Thalassarche chlororhynchos</i> (Atlantic yellow-nosed albatross)	VU/MI	No	No	42.52	1	Y
<i>Thalasseus bergii</i> (crested tern)	MI	No	No	1.81	233	Y
<i>Tringa brevipes</i> (grey-tailed tattler)	P4/MI	No	No	0.58	288	Y
<i>Tringa glareola</i> (wood sandpiper)	MI	No	No	0.28	225	Y
<i>Tringa nebularia</i> (common greenshank, greenshank)	MI	No	No	0.28	409	Y
<i>Tringa stagnatilis</i> (marsh sandpiper, little greenshank)	MI	No	No	0.28	33	Y

Species name	Conservation status	Suitable habitat features? [Y/N]	Suitable vegetation type? [Y/N]	Distance of closest record to application area (km)	Number of known records (total)	Are surveys adequate to identify? [Y, N, N/A]
<i>Tringa totanus</i> (common redshank, redshank)	MI	No	No	8.22	5	Y
<i>Xenus cinereus</i> (terek sandpiper)	MI	No	No	1.81	70	Y

T: threatened, CR: critically endangered, EN: endangered, VU: vulnerable, P: priority

A.5. Land degradation risk table

Risk categories	All soil types in application area (Note: these risk measurements were recorded prior to the installation of the Nickol Bay levee bank)
Wind erosion	~99% of map unit has a high to extreme
Water erosion	~99% of map unit has a very high to extreme hazard
Salinity at surface	30% of map unit has a moderate to extreme risk
Subsurface acidification susceptibility	0% of map unit has a high susceptibility
Flood hazard	~99% of the map unit has a moderate to high hazard
Water logging and inundation	~99% of map unit has a moderate to very high risk

Natural Resource Information, WA (DPIRD, 2019)

Appendix B. Assessment against the clearing principles

Assessment against the clearing principles	Variance level	Is further consideration required?
Environmental value: biological values		
<p><u>Principle (a):</u> "Native vegetation should not be cleared if it comprises a high level of biodiversity."</p> <p><u>Assessment:</u></p> <p>The area proposed to be cleared is not likely to contain locally significant flora, fauna, habitats or assemblages of plants.</p>	Not likely to be at variance	Yes <i>Refer to Section 3.2.1, above.</i>
<p><u>Principle (b):</u> "Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna."</p> <p><u>Assessment:</u></p> <p>The area proposed to be cleared is not likely to contain significant habitat for conservation significant fauna. However, individuals may be present at the time of clearing.</p>	May be at variance	Yes <i>Refer to Section 3.2.2, above.</i>
<p><u>Principle (c):</u> "Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora."</p> <p><u>Assessment:</u></p> <p>The area proposed to be cleared does not contain threatened flora species or any suitable habitat.</p>	Not likely to be at variance	No
<p><u>Principle (d):</u> "Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a threatened ecological community."</p> <p><u>Assessment:</u></p> <p>The area proposed to be cleared does not contain species that can indicate a threatened ecological community.</p>	Not likely to be at variance	No

Assessment against the clearing principles	Variance level	Is further consideration required?
Environmental value: significant remnant vegetation and conservation areas		
<p><u>Principle (e):</u> <i>“Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.”</i></p> <p><u>Assessment:</u></p> <p>The extent of the mapped vegetation association and native vegetation in the local area is consistent with the national objectives and targets for biodiversity conservation in Australia (Commonwealth of Australia, 2001). The vegetation proposed to be cleared is not considered to be part of a significant ecological linkage in the local area.</p>	Not at variance	No
<p><u>Principle (h):</u> <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.”</i></p> <p><u>Assessment:</u></p> <p>Given the distance to the nearest conservation area, the proposed clearing is not likely to have an impact on the environmental values of nearby conservation areas.</p>	Not likely to be at variance	No
Environmental value: land and water resources		
<p><u>Principle (f):</u> <i>“Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.”</i></p> <p><u>Assessment:</u></p> <p>Watercourses have been mapped as occurring within the application area. Therefore, a small area of the proposed clearing is growing in an environment associated with a watercourse. However, given the location of the Nickol Bay levee bank, the water courses mapped within the application area have been altered, and as a result the proposed clearing is unlikely to be significant.</p>	At variance	No
<p><u>Principle (g):</u> <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.”</i></p> <p><u>Assessment:</u></p> <p>The rangeland survey information indicates that the soils of the application area are moderately to highly susceptible to both water and wind erosion when cleared of perennial vegetation, however, with the protection of the Nickol Bay levee bank around the application this risk has been decreased. Proposed clearing is not likely to be at variance for land degradation (CSLC, 2023).</p>	Not likely to be at variance	No
<p><u>Principle (i):</u> <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.”</i></p> <p><u>Assessment:</u></p> <p>Given the Nickol Bay levee bank has altered the local watercourses mapped within the application area and there are no wetlands or Public Drinking Water Sources Areas recorded within the application area, the proposed clearing is unlikely to impact surface or ground water quality.</p>	Not likely to be at variance	No
<p><u>Principle (j):</u> <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.”</i></p> <p><u>Assessment:</u></p>	Not likely to be at variance	No

Assessment against the clearing principles	Variance level	Is further consideration required?
The application area occurs in floodplains and adjacent to drainage zones, however, due to the installation of the Nickol Bay levee bank, the application area is now protected from intense flooding events. The proposed clearing is not likely to contribute to increased incidence or intensity of flooding that is naturally experienced within the area.		

Appendix C. Vegetation condition rating scale

Vegetation condition is a rating given to a defined area of vegetation to categorise and rank disturbance related to human activities. The rating refers to the degree of change in the vegetation structure, density and species present in relation to undisturbed vegetation of the same type. The degree of disturbance impacts upon the vegetation's ability to regenerate. Disturbance at a site can be a cumulative effect from a number of interacting disturbance types.

Considering its location, the scale below was used to measure the condition of the vegetation proposed to be cleared. The vegetation condition scale used is that for the Eremaean and Northern Botanical Provinces indicated in the Environmental Protection Authority (EPA) and the Department of Parks and Wildlife (DPaW) (2015).

Table 1: Vegetation condition scale (EPA and DPaW, 2015)

Vegetation Condition	Eremaean and Northern Botanical Provinces
1	
2	Pristine or nearly so, no obvious signs of damage caused by human activities since European settlement.
3	Some relatively slight signs of damage caused by human activities since European settlement. For example some signs of damage to tree trunks caused by repeated fire, the presence of some relatively non-aggressive weeds or occasional vehicle tracks.
4	More obvious signs of damage caused by human activity since European settlement, including some obvious impact on the vegetation structure such as that caused by low levels of grazing or slightly aggressive weeds.
5	Still retains basic vegetation structure or ability to regenerate it after very obvious impacts of human activities since European settlement, such as grazing, partial clearing, frequent fires or aggressive weeds.
6	Severely impacted by grazing, very frequent fires, clearing or a combination of these activities. Scope for some regeneration but not to a state approaching good condition without intensive management. Usually with a number of weed species present including very aggressive species.
7	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.

Appendix D. Biological survey information excerpts / photographs of the vegetation

To support the Gascoyne Food Bowl Initiative, a detailed flora and vegetation survey was undertaken during 17-20 October 2016 (Strategen, 2017), with additional areas being surveyed on 5 December 2018 (Strategen, 2019) (Figure 2). A targeted survey for priority flora species was also undertaken on 3 September 2020, of the additional areas surveyed in 2019 (Strategen-JBS&G, 2020) (Figure 3).

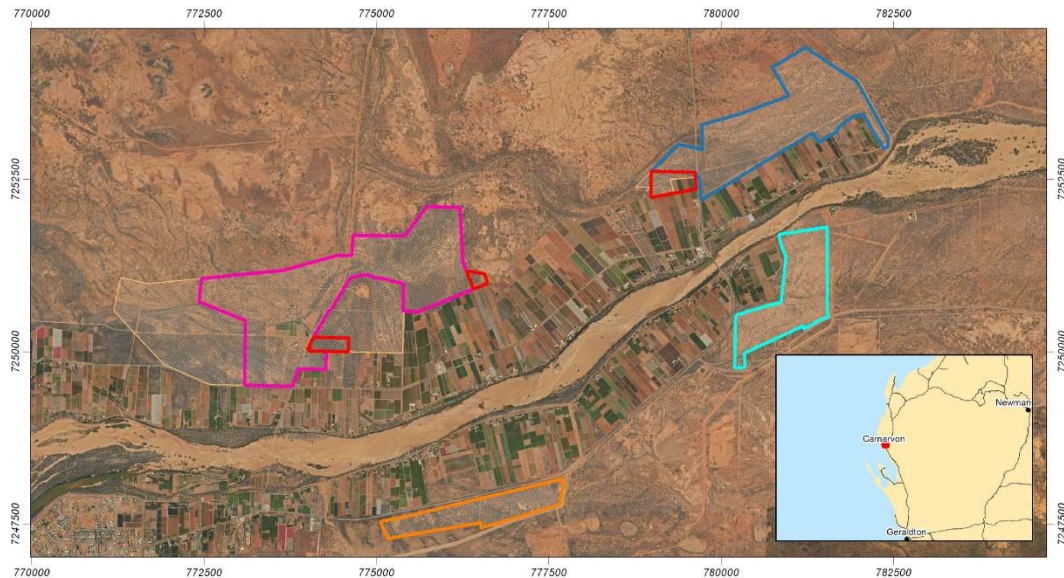


Figure 1: Survey area

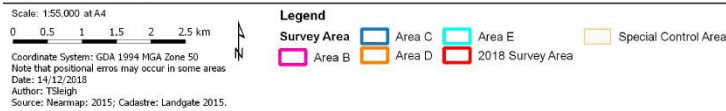


Figure 2: Boundaries of the survey area where red areas indicate 2019 survey efforts (Strategen, 2019)

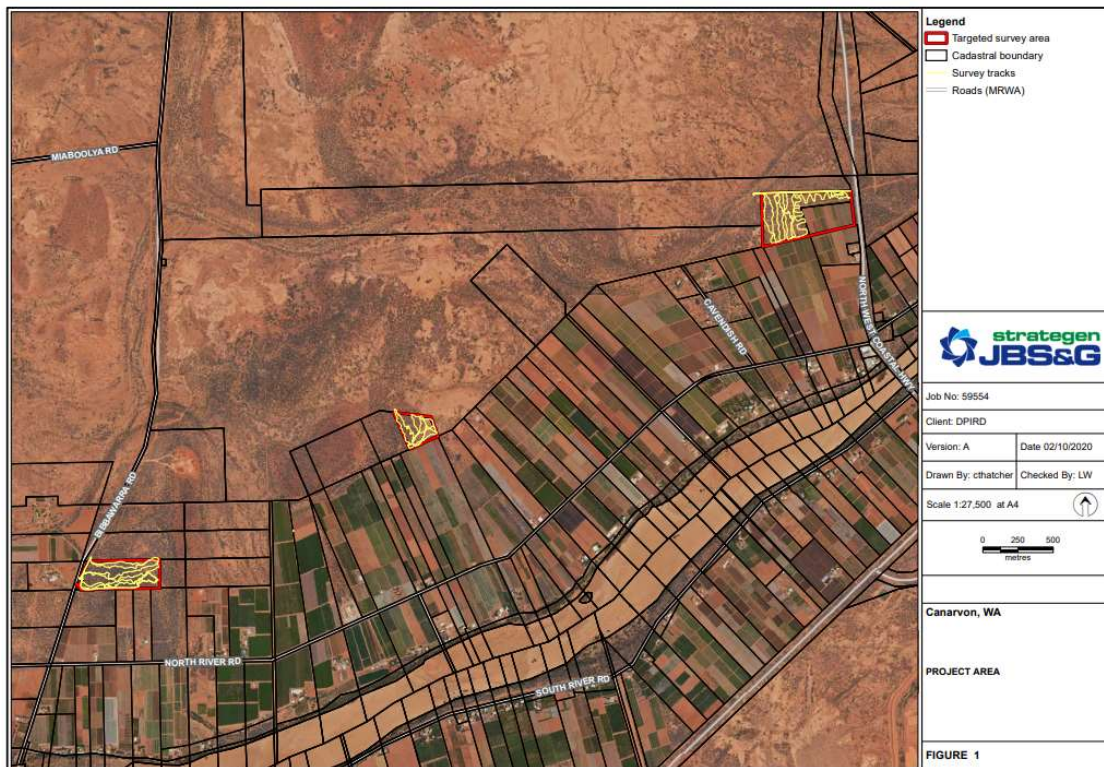


Figure 3: Boundaries of the targeted flora survey (Strategen-JBS&G, 2020)

Table 2: Six vegetation types were recorded within the survey area (Strategen, 2017 and 2019)

Vegetation Type	Description
ASL (1): Acacia Shrubland	Tall Sparse to Open Shrubland of <i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i> and / or <i>A. synchronicia</i> with a Sparse to Open Shrubland of <i>Rhagodia eremaea</i> and <i>Alectryon oleifolius</i> subsp. <i>oleifolius</i> and an Open Tussock Grassland of * <i>Cenchrus ciliaris</i> and / or <i>Chloris pumilio</i> .
ASL (2): Acacia Shrubland	Tall Sparse Shrubland of <i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i> and / or <i>A. synchronicia</i> with a Sparse Chenopod Shrubland of <i>Atriplex amnicola</i> and <i>A. semilunaris</i> and Sparse Tussock Grassland of * <i>Cenchrus ciliaris</i> .
EWL (3): <i>Eucalyptus</i> woodland	Low Woodland of <i>Eucalyptus victrix</i> with a Sparse Tall Shrubland of <i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i> and <i>Rhagodia eremaea</i> and an Open Tussock grassland of * <i>Cenchrus ciliaris</i> .
CSL (4): Chenopod shrubland	Low Open mixed Chenopod Shrubland (<i>Atriplex holocarpa</i> , <i>A. amnicola</i> , <i>Threlkeldia diffusa</i>).
CSL (5): Chenopod shrubland	Open Chenopod Shrubland of <i>Maireana polypterygia</i> with a mixed Low Sparse Chenopod Shrubland (<i>Sclerolaena eurotioides</i> , <i>Atriplex codonocarpa</i> , <i>A. semilunaris</i>) with a Low Open Forbland of <i>Tetragonia diptera</i> .
CDSL (6): <i>Chenopodium</i> and <i>Duma</i> shrubland	<i>Chenopodium</i> and <i>Duma</i> Shrubland Open Shrubland of <i>Chenopodium auricomum</i> and <i>Duma florulenta</i> with a Low Sparse mixed Tussock grassland (<i>Eulalia aurea</i> , <i>Panicum decompositum</i> , <i>Sporobolus mitchellii</i>) and +/- Isolated Low Trees of <i>Eucalyptus victrix</i> .
Cleared	Cleared areas.

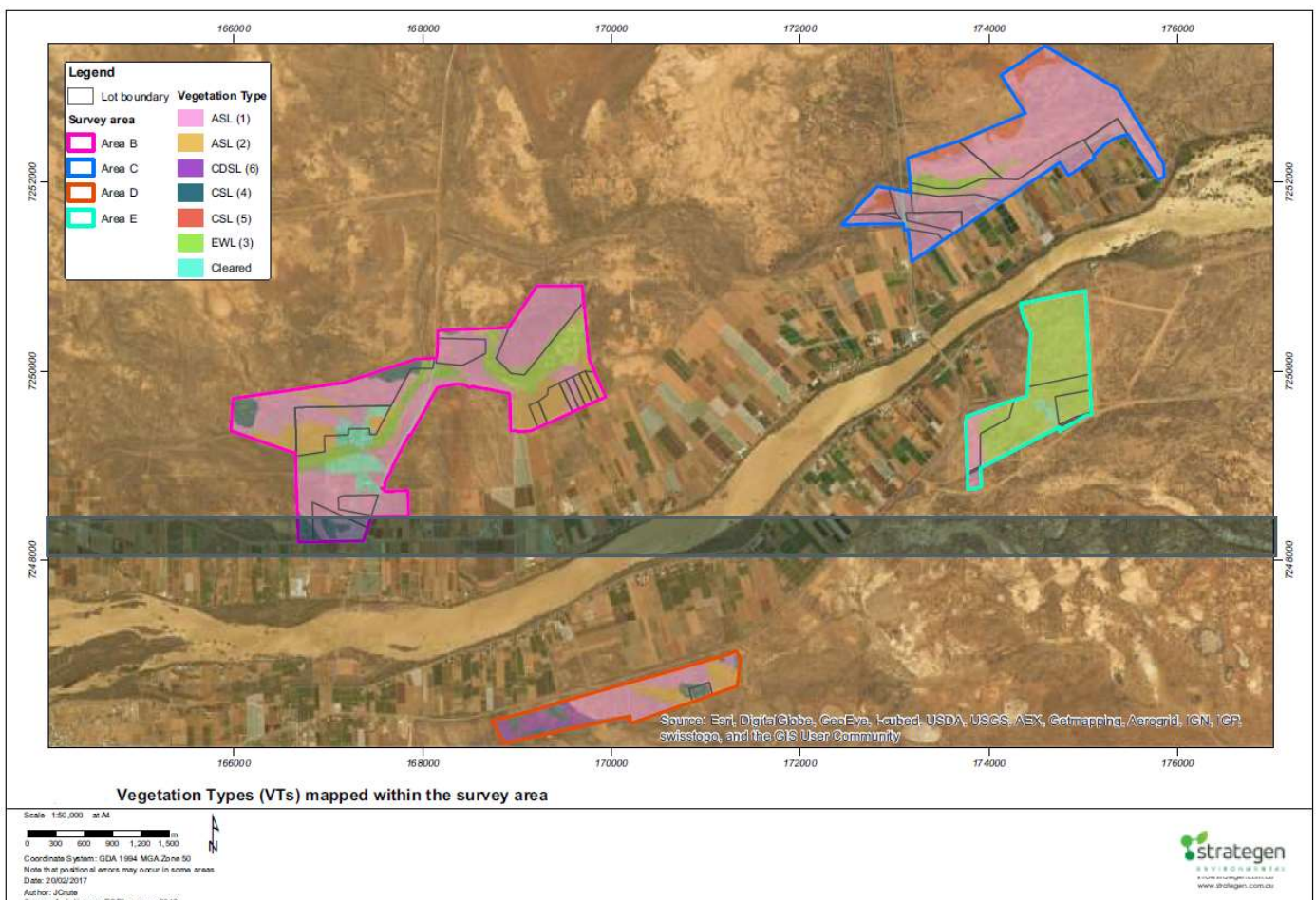


Figure 4: Vegetation Types (VTs) mapped within the survey area (Strategen, 2017 and 2019)

The majority of the survey area (89 per cent) showed signs of degradation due to historical clearing and grazing by livestock. The remaining area was recorded as being pristine, or nearly so (Figure 4).

Within the survey area, 103 native flora taxa representing 29 families and 68 genera were recorded during the survey, including the additional areas surveyed in 2019 (Strategen, 2019). A total of 14 introduced taxa were recorded in the survey area, of which none are a Declared Plant species pursuant to section 22 of the *Biosecurity and Agriculture Management Act 2007*. No EPBC Act or BC Act listed flora were recorded within the survey area (Strategen, 2017; 2019). One Priority flora species, *Corchorus congener* (P3), was potentially recorded during the survey. Subsequent review of the specimen determined that it is likely an *Acacia* sp. A targeted survey was only undertaken over the additional areas (2019 survey areas), no conservation significant flora species were recorded (Strategen-JBS&G, 2020).

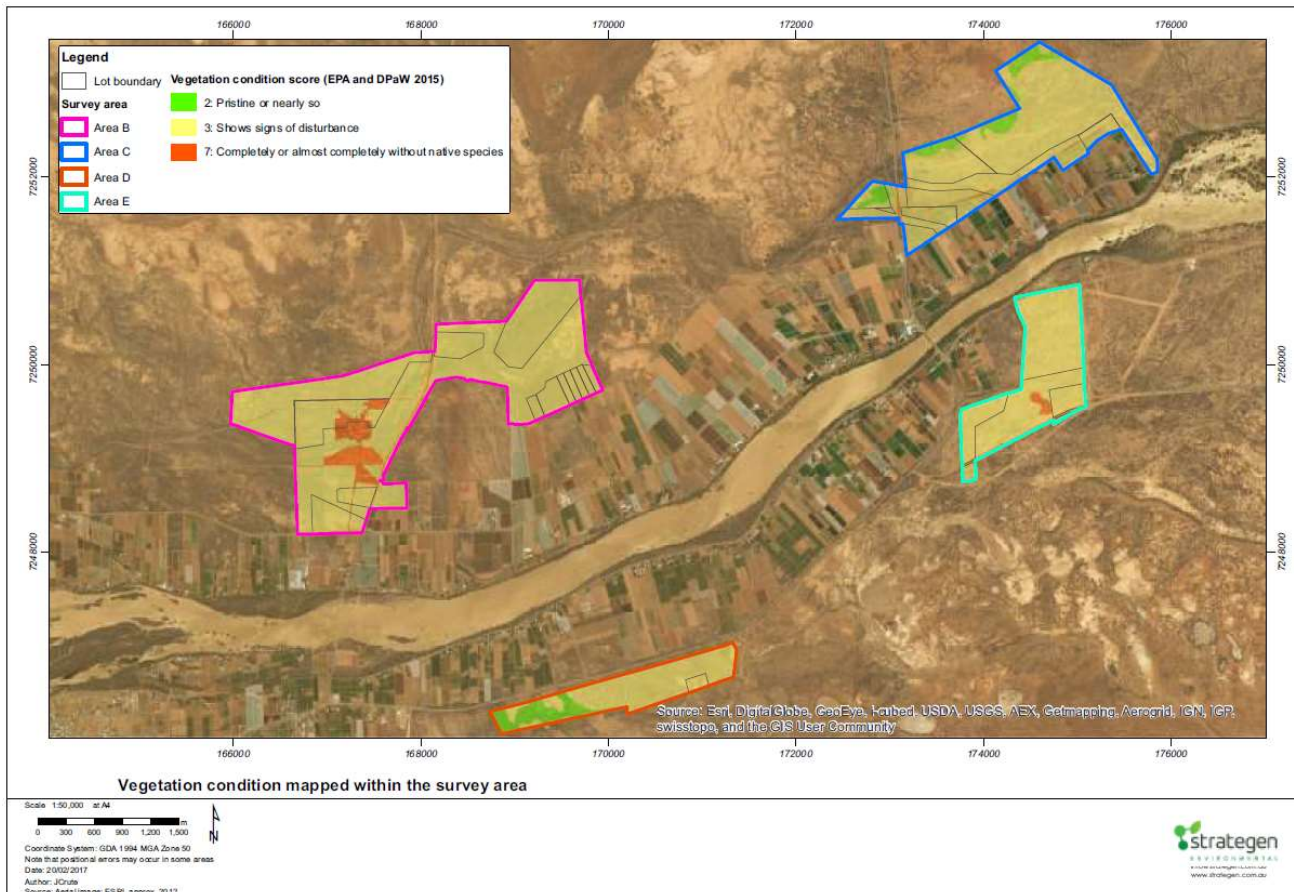


Figure 5: Vegetation condition (VC) within the survey area (Strategen, 2017 and 2019) (see Appendix C: Table 1 for VC scale details)

Limitations

A review of the survey limitations identified no constraints that might have affected the flora and vegetation assessment. However, it is noted that the survey was conducted in October (spring), which is slightly later than what is recommended within the Eremaean Province, that is, 6-8 weeks post-wet season (August-September). While the survey was conducted slightly later than recommended, annual species were still present and able to be identified in most cases, therefore this factor is not considered to be a constraint (Strategen, 2019).

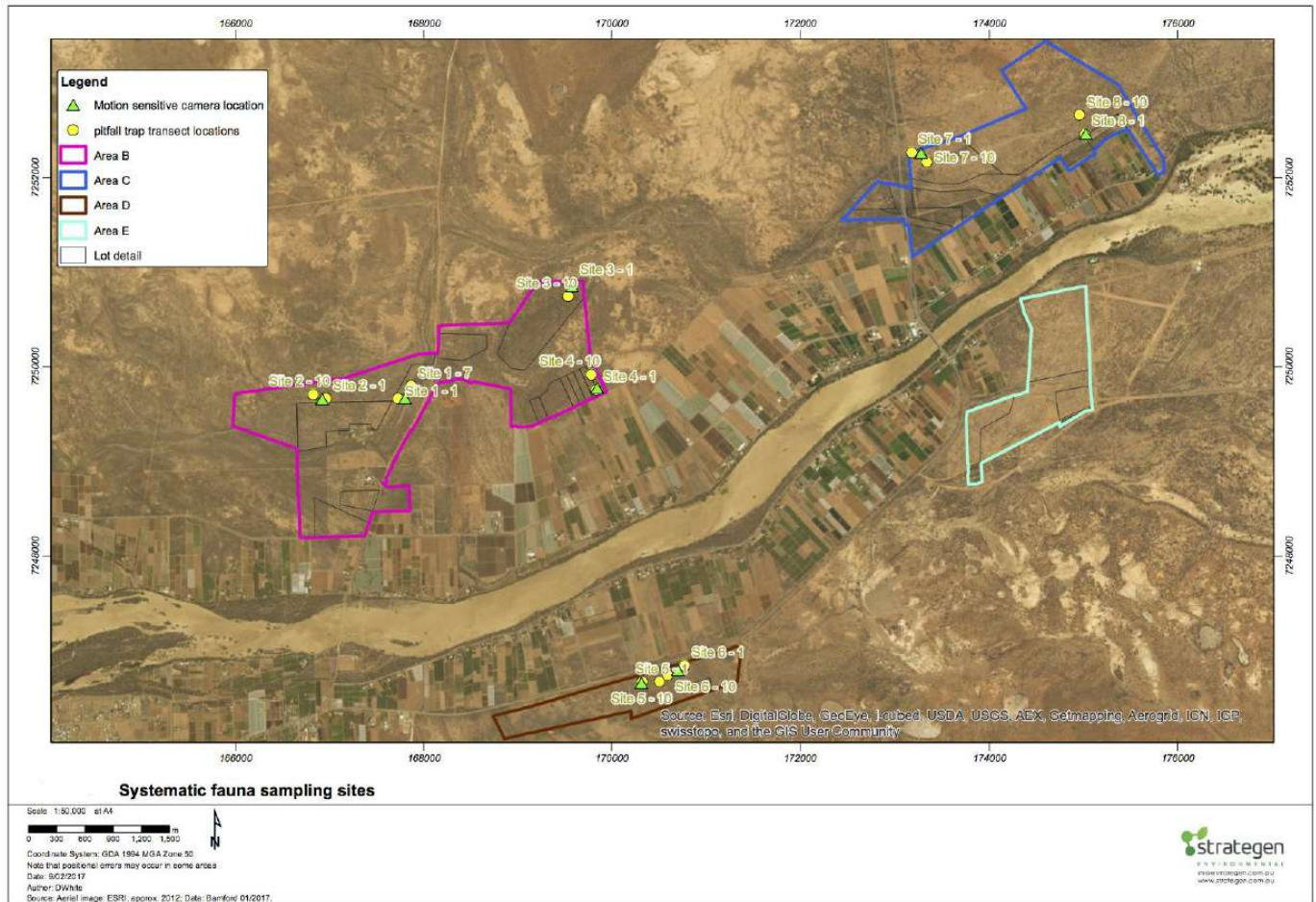


Figure 6: Locations of fauna sampling sites in 2016 field investigations (Bamford Consulting Ecologists, 2017)



Figure 7: According to the 2016 fauna field investigations, the vegetation substrate associations (VSA) within the application area are a combination of VSA 3 - Open Acacia shrubland on red clay loam plain (photo on left) and VSA 4 - Open Eucalyptus woodland over shrubland plain (photo on right) (Strategen, 2017, Bamford Consulting Ecologists, 2017).

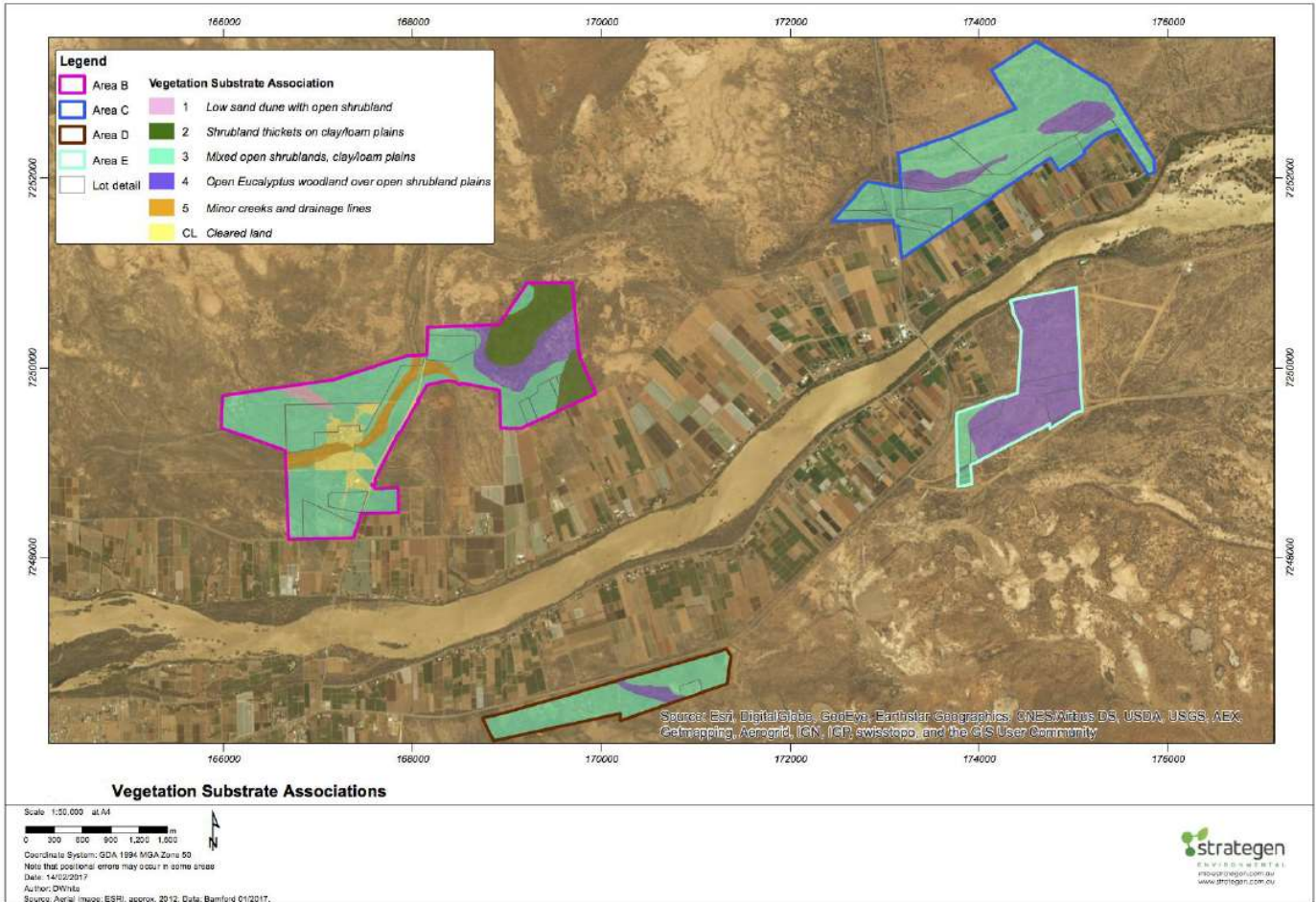


Figure 7: The distribution of vegetation substrate associations (VSA) across the Gascoyne Foodbowl project area, including the application area (Area D) (Bamford Consulting Ecologists, 2017).

Appendix E. Sources of information

E.1. GIS databases

Publicly available GIS Databases used (sourced from www.data.wa.gov.au):

- 10 Metre Contours (DPIRD-073)
- Aboriginal Heritage Places (DPLH-001)
- Aboriginal Heritage Places (DPLH-001)
- Cadastre (LGATE-218)
- Cadastre Address (LGATE-002)
- Contours (DPIRD-073)
- DBCA – Lands of Interest (DBCA-012)
- DBCA Legislated Lands and Waters (DBCA-011)
- Directory of Important Wetlands in Australia – Western Australia (DBCA-045)
- Environmentally Sensitive Areas (DWER-046)
- Flood Risk (DPIRD-007)
- Groundwater Salinity Statewide (DWER-026)
- Hydrography – Inland Waters – Waterlines
- Hydrological Zones of Western Australia (DPIRD-069)
- IBRA Vegetation Statistics
- Imagery
- Local Planning Scheme – Zones and Reserves (DPLH-071)
- Native Title (ILUA) (LGATE-067)
- Offsets Register – Offsets (DWER-078)
- Pre-European Vegetation Statistics
- Public Drinking Water Source Areas (DWER-033)
- Ramsar Sites (DBCA-010)
- Regional Parks (DBCA-026)
- Remnant Vegetation, All Areas
- RIWI Act, Groundwater Areas (DWER-034)
- RIWI Act, Surface Water Areas and Irrigation Districts (DWER-037)
- Soil Landscape Land Quality – Flood Risk (DPIRD-007)
- Soil Landscape Land Quality – Phosphorus Export Risk (DPIRD-010)
- Soil Landscape Land Quality – Subsurface Acidification Risk (DPIRD-011)
- Soil Landscape Land Quality – Water Erosion Risk (DPIRD-013)
- Soil Landscape Land Quality – Water Repellence Risk (DPIRD-014)
- Soil Landscape Land Quality – Waterlogging Risk (DPIRD-015)
- Soil Landscape Land Quality – Wind Erosion Risk (DPIRD-016)
- Soil Landscape Mapping – Best Available
- Soil Landscape Mapping – Systems

Restricted GIS Databases used:

- ICMS (Incident Complaints Management System) – Points and Polygons
- Threatened Flora (TPFL)
- Threatened Flora (WAHerb)
- Threatened Fauna
- Threatened Ecological Communities and Priority Ecological Communities
- Threatened Ecological Communities and Priority Ecological Communities (Buffers)

E.2. References

- 4 Ways Pty Ltd (2022) *Clearing permit application CPS 9964/1*, received 18 November 2022 (DWER Ref: DWERDT691467).
- 4 Ways Pty Ltd (2023) *Supporting information for clearing permit application CPS 9964/1 – irrigation needs and horticulture crops*, received 12 January 2023 (DWER Ref: DWERDT710173).
- Australian Museum (2020) *Peregrine Falcon*. Government of New South Wales. Available at: <https://australianmuseum.net.au/learn/animals/birds/peregrine-falcon/>.
- Bamford Consulting Ecologists (2017) *Carnarvon Horticulture Expansion Fauna Assessment Site*, prepared for Strategen (DWER Ref: DWERDT709524).
- Benshemesh, J. (2007) *National Recovery Plan for Malleefowl*. Department for Environment and Heritage, South Australia. Available from <https://www.dcceew.gov.au/environment/biodiversity/threatened/recovery-plans/malleefowl-leipoa-ocellata-2007>
- Commissioner of Soil and Land Conservation (CSLC) (2023) *Additional advice from Buddy Wheaton for clearing permit application CPS 9964/1*, received 23 January 2023. Department of Primary Industries and Regional Development, Western Australia (DWER Ref: DWERDT716099).
- Commonwealth of Australia (2001) *National Objectives and Targets for Biodiversity Conservation 2001-2005*, Canberra.
- Department of Environment and Conservation (DEC) (2012a) *Western Barred Bandicoot *Perameles bougainville*, Burrowing Bettong *Bettongia lesueur* and Banded Hare-Wallaby *Lagostrophus fasciatus* National Recovery Plan*. Wildlife Management Program No. 49. Available from [Western Barred Bandicoot \(*Perameles bougainville*\), Burrowing Bettong \(*Bettongia lesueur*\) and Banded Hare-Wallaby \(*Lagostrophus fasciatus*\) National Recovery Plan - DCCEEW](#)
- Department of Environment and Conservation (DEC) (2012b) *Western Spiny-tailed Skink (*Egernia stokesii*) National Recovery Plan*. Wildlife Management Program No. 53. Available from [Western Spiny-tailed Skink \(*Egernia stokesii*\) Recovery Plan - DCCEEW](#)
- Department of the Environment and Heritage (DEH) (2006) *Advice to the Minister for the Environment and Heritage from the Threatened Species Scientific Committee (the Committee) on Amendments to the list of Threatened Species under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) - *Amytornis textilis textilis* (Thick-billed Grasswren (western subspecies)) listing advice*, June, 2006. Available from [Amytornis textilis textilis \(Thick-billed Grasswren \(western subspecies\)\) - DCCEEW](#)
- Department of Environment Regulation (DER) (2013) *A guide to the assessment of applications to clear native vegetation*. Perth. Available from: https://www.der.wa.gov.au/images/documents/your-environment/native-vegetation/Guidelines/Guide2_assessment_native_veg.pdf.
- Department of Primary Industries and Regional Development (DPIRD) (2019) *NRInfo Digital Mapping*. Department of Primary Industries and Regional Development. Government of Western Australia. URL: <https://maps.agric.wa.gov.au/nrm-info/> (accessed 28 February 2023).
- Department of Water and Environmental Regulation (DWER) (2019) *Procedure: Native vegetation clearing permits*. Joondalup. Available from: https://dwer.wa.gov.au/sites/default/files/Procedure_Native_vegetation_clearing_permits_v1.PDF.
- Department of Water and Environmental Regulation (DWER) (2021) *Assessing the 2021 Gascoyne River flood at Carnarvon – Preliminary Report*, available from [Assessment of February 2021 Gascoyne River flood event at Carnarvon \(water.wa.gov.au\)](#).
- Department of Water and Environmental Regulation (DWER) (2022a) *Land Use Planning Assessment Note for Development Application for Lot 565 North West Coastal Highway Carnarvon*, 22 July 2022 (DWER Ref: DWERDT768681).
- Department of Water and Environmental Regulation (DWER) (2022b) *Development application response letter for Lot 565 North West Coastal Highway Carnarvon*, 2 August 2022 (DWER Ref: DWERDT768687).

- Department of Water and Environmental Regulation (DWER) (Regulatory Services – Water) (2023a) *Rights in Water and Irrigation Act 1914 advice for clearing permit application CPS 9964/1*, received 23 January 2023 (DWER Ref: DWERDT726195).
- Department of Water and Environmental Regulation (DWER) (Regional Services – Carnarvon) (2023b) *Advice on monitoring bore located on property from DWER Regional Services for clearing permit application CPS 9964/1*, received 2 May 2023 (DWER Ref: DWERDT772456).
- Environmental Protection Authority (EPA) (2016) *Technical Guidance - Flora and Vegetation Surveys for Environmental Impact Assessment*. Available from: http://www.epa.wa.gov.au/sites/default/files/Policies_and_Guidance/EPA%20Technical%20Guidance%20-%20Flora%20and%20Vegetation%20survey_Dec13.pdf.
- Environmental Protection Authority (EPA) (2016) *Technical Guidance – Terrestrial Fauna Surveys*. Available from: https://www.epa.wa.gov.au/sites/default/files/Policies_and_Guidance/Tech%20guidance-%20Terrestrial%20Fauna%20Surveys-Dec-2016.pdf.
- Environmental Protection Authority (EPA) and Department of Parks and Wildlife (DPaW) (2015) *Technical Guide – Flora and Vegetation Surveys for Environmental Impact Assessment* (eds.: K. Freeman, G. Stack, S. Thomas and N. Woolfrey), Perth, Western Australia.
- Government of Western Australia. (2019) *2018 Statewide Vegetation Statistics incorporating the CAR Reserve Analysis (Full Report). Current as of March 2019*. WA Department of Biodiversity, Conservation and Attractions. <https://catalogue.data.wa.gov.au/dataset/dbca-statewide-vegetation-statistics>
- Keighery, B.J. (1994) *Bushland Plant Survey: A Guide to Plant Community Survey for the Community*. Wildflower Society of WA (Inc). Nedlands, Western Australia.
- Northcote, K. H. with Beckmann G G, Bettenay E., Churchward H. M., van Dijk D. C., Dimmock G. M., Hubble G. D., Isbell R. F., McArthur W. M., Murtha G. G., Nicolls K. D., Paton T. R., Thompson C. H., Webb A. A. and Wright M. J. (1960-68) *Atlas of Australian Soils*, Sheets 1 to 10, with explanatory data. CSIRO and Melbourne University Press: Melbourne.
- Rix M.G., Huey J.A., Cooper S.J.B., Austin A.D. and Harvey M.S. (2018) *Conservation systematics of the shield-backed trapdoor spiders of the nigrum-group (Mygalomorphae, Idiopidae, Idiosoma): integrative taxonomy reveals a diverse and threatened fauna from south-western Australia*. ZooKeys 756: 1-121. <https://doi.org/10.3897/zookeys.756.24397>.
- Shepherd, D.P., Beeston, G.R. and Hopkins, A.J.M. (2001) *Native Vegetation in Western Australia, Extent, Type and Status*. Resource Management Technical Report 249. Department of Agriculture, Western Australia.
- Shire of Carnarvon (2023a) *Advice for clearing permit application CPS 9964/1*, received 13 January 2023 (DWER Ref: DWERDT711253).
- Shire of Carnarvon (2023b) *Advice for clearing permit application CPS 9964/1 – development approval*, received 20 March 2023 (DWER Ref: DWERDT752573).
- Strategen Environmental Consultants Pty Ltd (Strategen) (2017) *Gascoyne Food Bowl Initiative – Level 2 Flora and Vegetation Survey*, prepared for Shire of Carnarvon and Department of Agriculture and Food, Subiaco (DWER Ref: DWERDT709525).
- Strategen Environmental Consultants Pty Ltd (Strategen) (2019) *Gascoyne Food Bowl Initiative - Flora and Vegetation Survey*, prepared for Department of Planning, Infrastructure and Regional Development, Subiaco (DWER Ref: DWERDT709526).
- Strategen-JBS&G (2020) *Gascoyne Food Bowl - Targeted flora survey*, prepared for Department of Primary Industries and Regional Development, Subiaco (DWER Ref: DWERDT709527).
- Trudgen, M.E. (1991) *Vegetation condition scale* in National Trust (WA) 1993 Urban Bushland Policy. National Trust of Australia (WA), Wildflower Society of WA (Inc.), and the Tree Society (Inc.), Perth.

Western Australian Herbarium (1998-). *FloraBase - the Western Australian Flora*. Department of Biodiversity, Conservation and Attractions, Western Australia. <https://florabase.dpaw.wa.gov.au/> (Accessed 28 February 2023).

Western Botanical (2013) Level 1 Flora and Vegetation Assessment, Gascoyne River Floodplain, Carnarvon, Western Australia. Report for Department of Agriculture and Food WA. October 2013.