Government of Western Australia
Department of Water and Environmental Regulation

Clearing Permit Decision Report

This report has been prepared to fulfil the requirements of an accredited environmental assessment process between the Commonwealth and State governments, pursuant to a bilateral agreement established under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

This report is set out in four parts:
- Part 1: Application, site details and outcome;
- Part 2: Assessment against matters of national environmental significance (pursuant to the EPBC Act);
- Part 3: Assessment against the clearing principles (pursuant to the *Environmental Protection Act 1986* (EP Act)). Appeal rights pursuant to section 101A of the EP Act are relevant to this section of the report;
- Part 4. References and databases.

Part 1: Application details and outcome

1.1. Permit application details

Permit number:	CPS 10468/1
EPBC number:	2023/09630
Permit type:	Area permit
Applicant name:	Sporting Shooters Association of Australia WA Inc's (SSAAWA)
Application received:	22 December 2023
Application area:	6 hectares of native vegetation
Purpose of clearing:	Construction of a public shooting range and associated amenities
Method of clearing:	Mechanical clearing
Property:	Lot 5607 on Deposited Plan 208673
Location (LGA area/s):	Pinjar
Localities (suburb/s):	City of Wanneroo

1.2. Description of clearing activities

The vegetation proposed to be cleared is contained within a single contiguous area surrounded by intact remnant vegetation (see Figure 1, Section 1.5). The complex is bound by Neaves Road to the south and Perry Road to the west in the locality of Pinjar, approximately 47 kilometres north-east of Perth.

The site is located in the Gnangara – Moore River State Forest which is also Bush Forever Site 380. It is situated on Crown Land (title LR3121/481) which is managed by the Department of Biodiversity, Conservation and Attractions (DBCA), with a valid lease to the Sporting Shooters Association of Australia WA (SSAAWA) (Lease No. 1490/97).

The development footprint is six hectares and SSAAWA proposes to construct a public shooting range with parking amenities. The proposed shooting range aims to provide a facility for members of the public to recreationally use firearms without a requirement of joining a club and associated commitments (SSAAWA, 2024). The area is also mapped as an Environmental Sensitive Area (ESA).

1.3. Decision on application

Decision:	Refused
Decision date:	15 November 2024
Decision area:	6 hectares of native vegetation, as depicted in Section 1.5, below.

1.4. Reasons for decision

The 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 (the department) 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 section 1.4 of this report);
- relevant datasets (see Appendix C of this report);
- the findings from a Flora and Vegetation survey (Anders, 2023);
- the findings from a Fauna survey (Ecoscape, 2022);
- advice received from the Department of Climate Change, Energy, the Environment and Water (DCCEEW) (DCCEEW, 2024);
- department expert advice in regard to impacts on the Priority 1, Public Drinking Water Source Area (DWER, 2024);
- advice received from the City of Wanneroo (City of Wanneroo, 2024);
- expert advice received from the Department of Planning, Land and Heritage (DPLH) (DPLH, 2024); and
- expert advice received from the DBCA's swan coast district (DBCA, 2024).

The assessment identified the proposed clearing will result in the following significant environmental impacts:

- The removal of 4.9 hectares of 'Banksia Woodland of the Swan Coastal Plain' Threatened Ecological Community (TEC), listed as Endangered under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), which is also representative of the 'FCT23B Swan Coastal Plain Northern *Banksia attenuatta- Banksia menziesii* woodlands', listed by the DBCA as a priority three Priority Ecological Community (PEC).
- The removal of approximately six (6) hectares of high-quality foraging habitat for the Endangered *Zanda latirostris* (Carnaby's cockatoo) and low-quality foraging habitat for the Vulnerable *Calyptorhynchus banksii naso* (Forest red-tailed black cockatoo), listed under the *Biodiversity Conservation Act 2016* (BC Act) and EPBC Act.
    - According to the fauna survey (Ecoscape, 2022), common foraging species for Carnaby's and Forest red-tailed black cockatoo species occur within the application area, with areas showing evidence of foraging in the form of chewed marri nuts. According to these species' Recovery Plans, foraging habitat that is in close proximity to roosting habitat, breeding habitat and a water source is critical habitat for black cockatoos and is important to the survival of the species. Given the number of roost sites within the local area (31), the foraging habitat is considered likely to support nearby individuals that roost in the locality and is considered to be critical habitat.
- The removal of six (6) hectares of native vegetation within Bush Forever Site 380, that is the Rosella Road bushland, Bullsbrook conservation area.
- The removal of native vegetation that is likely to provide suitable habitat for the Critically Endangered (listed under the EPBC Act) *Hesperocolletes douglasi* (Douglas' Broad headed Bee).
- Removal of native vegetation that provides suitable habitat for the threatened flora species *Caladenia huegelii* and *Drakaea elastica*.
- The potential introduction and spread of weeds and dieback into adjacent vegetation, which could impact on the quality of surrounding vegetation and its habitat values.
- Removal of approximately 0.496 hectares of wetland vegetation.
    - Expert advice received from DBCA stated that the vegetation mapped within the wetland area occurs in a good or better (Keighery, 1994) condition and that this portion of the wetland is likely to meet criteria for conservation category. Further investigation into wetland values and extent is required to determine significance of the wetland vegetation within the application area (DBCA, 2024).

In addition to the above, the Delegated officer considered that the proposed activity is a non-conforming and an incompatible land use within the mapped Priority 1, Public Drinking Water Source Area. The application area falls within a Priority one (1) zone of the Gnangara Underground Water Pollution Control Area which is a Public Drinking

Water Source Area and occurs within a Wellhead Protection Zone. It is considered that no management actions can be implemented to reduce the risk to the Priority 1 water reserve from the proposed works through the land use planning process under the Land Use Compatibility Table (LUCT) (DWER, 2024). The SSAAWA has notified the department that SSAAWA is currently in the process of applying for a Policy 13: *Policy and guidelines for recreation within public drinking water source areas* and for a special circumstance under the LUCT (SSAAWA, 2024).

In addition to this above matter, the Delegated Officer also took into consideration the following planning and other relevant matters in accordance with section 51O of the EP Act.

- The proposed clearing is not in accordance with the State Planning Policy 2.8 Appendix 2(ix)(b) which recommend that activities within Bush Forever Sites should avoid unacceptable losses to TEC's and species listed under the EPBC Act (DPLH, 2024).
- The proposed clearing is not in accordance with the State Planning Policy 2.0 Environment and Natural Resources Policy section 5.5 which states that the decision-making process should take into account the protection of high biodiversity and conservation values and seek to avoid and minimise any direct and indirect adverse impacts to high biodiversity or conservation values (DPLH, 2024).
- The proposed clearing is mapped as a Protected Natural Area under the City of Wanneroo's Local Biodiversity Plan 2018/18 – 2023/24. Protected Natural Areas are natural areas within the City of Wanneroo that are considered formally protected and include natural areas occurring on Crown Land vested with the State (City of Wanneroo, 2024).

Based on the impacts above, the department wrote to the SSAAWA on 5 June 2024 advising that the application is likely to be refused. In response, the SSAAWA advised that:

- The site where the application area is located is a designated for a shooting range for the last 50 years and will be the first state shooting range that would provide a place for shooting for both members and non-members.
- There is a high demand for a state shooting range based on the number of people in WA that holds a rifle.
- Alternative sites for this project were considered however, none of these sites were suitable (SSAAWA, 2024) because:
    - There must be a safety distance between each of the shooting ranges. Hence, the application area could not be placed at an alternative location on site away from the wellhead protection zone.
    - The location of the shooting rage needs to consider the public safety. The area to the north of the application area is locked up and has no access to the public making the application area an ideal place to situate the shooting range.
    - The existing facilities had no further capacity or the shooting ranges are currently being used.
    - SSAAWA require the state shooting range to be located first on the existing site at Pinjar to mitigate the public from proceeding any further along the access road. A fence would be installed to stop the public from accessing the other shooting ranges that are on site through the state shooting range.
- There may be a possibility to reduce the application area by reducing the current length of the application area, however there is no capacity for mitigation on site.
- SSAAWA are currently liaising with the department's water source protection branch to resolve the matter around impacts to public drinking water source area. SSAAWA argued that the site currently holds multiple shooting ranges and there was no issue in regard to impacts to public drinking water source (SSAAWA, 2024). It was explained to SSAAWA that while there is an existing shooting range and facilities on the site, the new proposed expansion and shooting range would be considered and assessed as a new recreation proposal, consistent with definitions of new recreation in Policy 13.

Having considered the available information and having had regard to the purpose of the proposed clearing and the planning framework, the Delegated Officer has formed the view that the severity of the environmental impacts in this case outweighs the necessity for the clearing. The Delegated Officer therefore considers that, on balance, the environmental impacts associated with the proposed clearing are unacceptable and it would not be appropriate to mitigate them using an environmental offset. This is supported by the WA Offsets Policy, which states that offsets are not appropriate for all projects

Accordingly, on the basis, it is the Delegated Officer's intention to refuse to grant a clearing permit.

1.5. 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 the department at the time of the assessment. This information was used to inform the assessment of Matters of National Environmental Significance contained in Part 2 and the clearing against the Clearing Principals, contained in Part 3.

Characteristic	Details
Local context	The area proposed to be cleared is part of an expansive tract of native vegetation in the intensive land use zone of Western Australia. It is surrounded by remnant vegetation from all directions. Aerial imagery and Spatial data indicates the local area (10-kilometre radius from the centre of the area proposed to be cleared) retains approximately 54.4 per cent of the original native vegetation cover.
Ecological linkage	The application area is not mapped within a formal ecological linkage or is unlikely to serve as a significant corridor to facilitate fauna movement.
Conservation areas	The application area is mapped within Bush Forever Site 380, that is the Rosella Road bushland, Bullsbrook conservation area. Bush Forever site 380 is recognised as an Environmental Sensitive Area.
Vegetation description	The flora and vegetation survey (Anders, 2023) indicates the vegetation within the proposed clearing area consists of *Banksia attenuata*- B. menziesii open woodland *over Xanthorrhoea preissii* mid sparse shrubland over *Eremaea pauciflora* low sparse shrubland across 4.9 hectares of the application area. This vegetation type was further separated into burnt and unburnt. Within the application area, burnt was the most dominant vegetation type occupying 68 per cent of the application area. Along the mapped watercourses that is within the application area, the vegetation is described as *Melaleuca preissiana* open woodland over *Xanthorrhoea preissii* mid sparse shrubland over *Dasypogon bromeliifolius* low sparse forbland (1.1 hectares) (Anders, 2023). Representative photos and the full survey descriptions and maps are available in Appendix B. The broad scale mapped vegetation type within the application area ranges from a low open forest and low open woodland of Banksia species, *Eucalyptus todtiana* (Pricklybark) to low woodland of Melaleuca species and sedgelands which occupy the moister sites. The mapped vegetation type retains approximately 71.67 per cent of the original extent (Government of Western Australia, 2019).
Vegetation condition	The flora and vegetation survey (Anders, 2023) indicate the vegetation within the proposed clearing area is in good to very good condition (Keighery, 1994). The full Keighery (1994) condition rating scale is provided in Appendix A. Representative photos and full survey mapping are available in Appendix B.
Climate and landform	The mean annual rainfall for this area is 794.7 millimetres. The application area falls within the Bassendean Jandakot phase and Bassendean drainage lines phase. The site is relatively flat throughout, with elevations of 56 m Australian Height Datum (AHD) at the southern end to 60 m AHD at the northern end (DPIRD, 2019).
Soil description	The sand within the application area is described as grey sand over pale yellow sands generally underlain by humic and iron podsols. Soils within the drainage line phase is described as peaty soils with shallow channels (Coterra Environmental, 2023).

Characteristic	Details
Waterbodies	The desktop assessment and aerial imagery indicated that a non-perennial minor river transect the area proposed to be cleared. A multiple use sumpland (lake Pinjar) is mapped to the northern end of the application area.
Hydrogeography	The application area is mapped within the Gnangara groundwater area proclaimed under the *Rights in Water Irrigation Act 1914* (RIWI Act 1914) and intersects a Priority one Public Drinking Water Source Area (DWER-033). Approximately 50 per cent of the application area also intersects a Wellhead Protection Zone. Salinity is mapped as less than 500 milligrams of Total Dissolved Solids.
Flora	According to the desktop assessment, 17 conservation significant flora species are mapped within the local area, of which four species are threatened and 13 are priority flora species.
Ecological communities	According to the desktop assessment, the application area is located within the mapped Priority 3 Banksia Woodlands of the Swan Coastal Plain ecological community. This vegetation community is a federally listed TEC under the EPBC Act.
Fauna	According to the desktop assessment, 24 conservation significant fauna species are recorded from the local area, consisting of 12 birds, five invertebrate species and seven mammal species. The application area is mapped within the distribution zone of Carnaby's black cockatoos and the FRTBC. Thirty-one black cockatoo roost sites are records within the local area with the closest being approximately 994 metres from the application area.

1.6. Site map

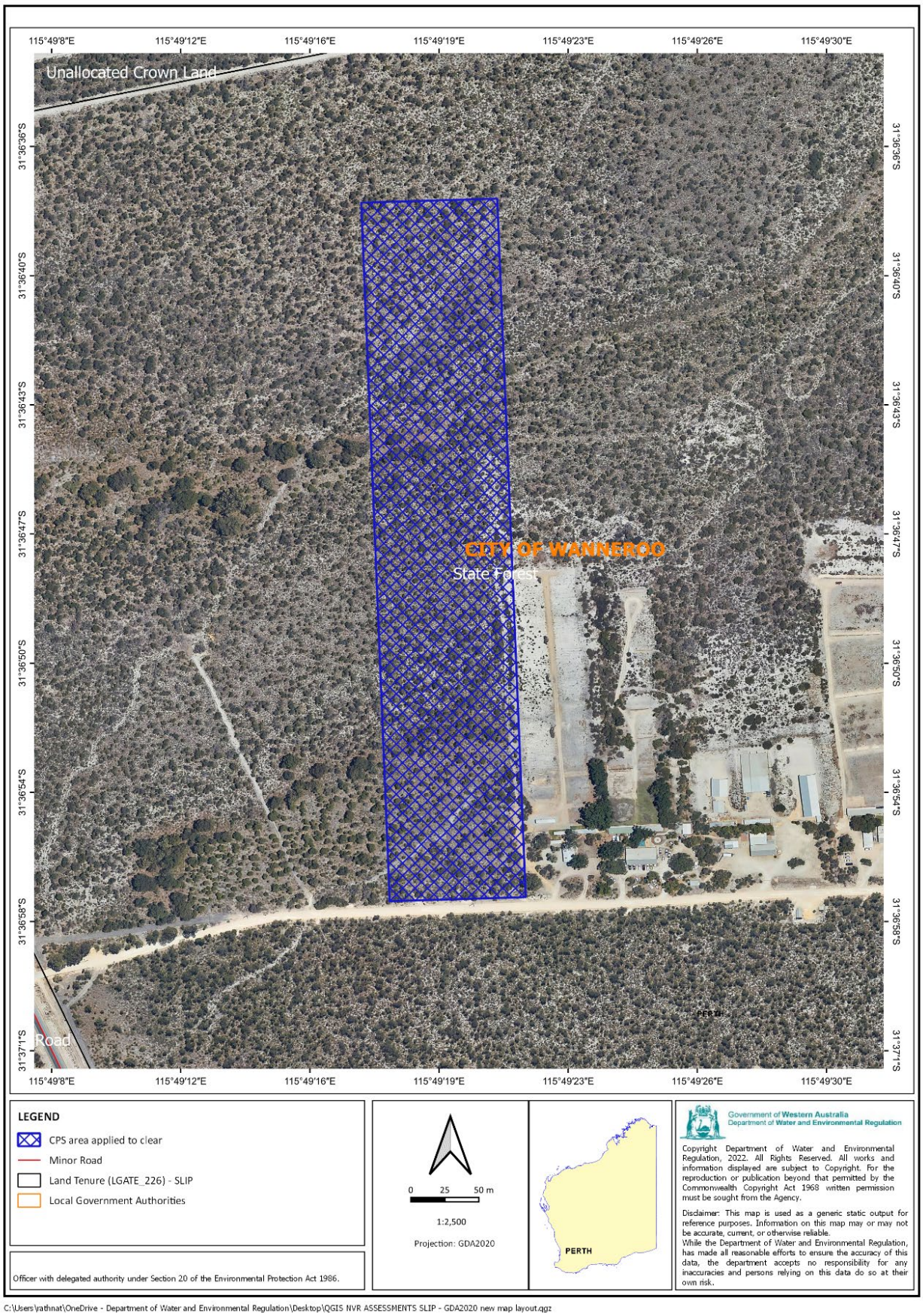

Figure 1 Map of the application area. The area cross-hatched blue indicates the area applied to clear.

Part 2: Assessment against matters of national environmental significance

2.1 Description of controlling actions

The proposed action was referred to the DCCEEW on 26 September 2023 (EPBC reference: 2023/09630) under the EPBC Act. The referral was advertised for public comments from 21 November 2023 until 5 December 2023. The proposed action was determined to be a controlled action on 17 December 2023. The Native Vegetation Clearing Permit (NVCP) application was submitted to the department on 22 December 2023 for assessment under the bilateral agreement provision between the Australian government and the Government of Western Australia (state government).

DCCEEW has, approved a one-off accreditation of the WA Part V Division 2 of the EP Act's assessment process to allow the department to assess and consider all relevant impacts of the proposed clearing on EPBC listed Matters of National Environmental Significance.

Based on the information in the referral, the proposed action is likely to have a significant impact on the following Matters of National Environmental Significance (MNES) listed under the EPBC Act:

- *Zanda latirostris* (Carnaby's cockatoo) listed as endangered
- *Calyptorhynchus banksii* subsp. *naso* (Forest red-tailed black cockatoo (FRTBC) listed as vulnerable
- *Hesperocolletes douglasi* (Douglas' Broadheaded Bee) listed as critically endangered
- Banksia Woodland of the Swan Coastal Plain TEC listed as endangered
- *Caladenia huegelii* (King Spider-orchid) listed as critically endangered
- *Drakaea elastica* (Glossy-leafed Hammer Orchid) listed as endangered

Carnaby's cockatoo

Carnaby's cockatoos are endemic to the southwest of Western Australia. Breeding takes place between late July and December and occurs mostly in the inland wheatbelt region of its distribution, in areas receiving between 300 and 750 millimetres of annual average rainfall (Saunders, 1974). During the non-breeding season (January to July) the majority of the birds move to the higher rainfall coastal regions of their range including the midwest coast, Swan Coastal Plain and south coast (Saunders, 1980; Saunders, 1990; Berry, 2008; Johnstone et al., 2011). There has been an apparent expansion in the breeding range to include areas further west and south since the middle of last century with a more rapid increase into the jarrah and marri forests of the southwest (Johnstone and Storr, 1998; Johnstone et al., 2011). This expansion in breeding range is due to threatening processes such as clearing of breeding habitat and competition for suitable breeding hollows.

Carnaby's cockatoo preferred habitat is remnant native eucalypt woodlands, especially those of salmon gum *Eucalyptus salmonophloia* (salmon gum) and *Eucalyptus wandoo* (wandoo), and in shrubland or kwongkan heathland dominated by plants of the Proteaceae family. It also occurs in forests containing *Corymbia calophylla, Eucalyptus marginata* and *Eucalyptus diversicolor* (marri, jarrah, karri) with *Eucalyptus gomphocephala* (tuart) (DAWE 2022; Parks and Wildlife, 2013).

Foraging resources for Carnaby's cockatoo include the seeds, flowers and nectar of native proteaceous plant species (e.g. *Banksia*, *Hakea* and *Grevillea* species), Eucalypts and Callistemon species. The species also forages on seeds of introduced species (e.g. *Pinus* and *Erodium* species, canola and almonds), insects and insect larvae. Carnaby's cockatoo generally forages within six kilometres of a night roost site and, while nesting, within a 12 kilometres radius of their nest site (DAWE, 2022).

Carnaby's cockatoo nests in large hollows in tall, living or dead eucalypts. It nests most commonly in smooth-barked wandoo and salmon gum, but has also been recorded breeding in *Eucalyptus longicornis* (red morrel), *Eucalyptus loxophleba* (York gum), tuart, *Eucalyptus rudis* (flooded gum), *Eucalyptus occidentalis* (swamp yate), *Eucalyptus salubris* (gimlet) and marri, and are said to nest in any species of eucalypt with a suitable hollow (DAWE, 2022; Parks and Wildlife, 2013).

Carnaby's black cockatoo night roosts are usually located in the tallest trees of an area, and near both food supply and surface water (DAWE 2020). Flocks will use different night roosts, often for weeks, or until the local food supply is exhausted. Flocks show some fidelity to night roosts with sites used in most years to access high quality feeding sites. However, not all-night roosts are used in every year (DPaW 2013).

Currently, the overall population trend for Carnaby's cockatoo is one of decline due to the loss and fragmentation of habitat as a result of the clearing of native vegetation (Saunders, 1990; Johnstone and Storr, 1998; Saunders and Ingram, 1998; Garnett *et al*., 2011).

The Carnaby's cockatoo recovery plan summarises habitat critical to the survival of Carnaby's cockatoos as:

- the eucalypt woodlands that provide nest hollows used for breeding, together with nearby vegetation that provides feeding, roosting and watering habitat that supports successful breeding;
- woodland sites known to have supported breeding in the past and which could be used in the future, provided adequate nearby food and/or water resources are available or are re-established; and
- in the non-breeding season the vegetation that provides food resources as well as the sites for nearby watering and night roosting that enable the cockatoos to effectively utilise the available food resources (Parks and Wildlife, 2013).

The recovery plan also states that success in breeding is dependent on the quality and proximity of feeding habitat within 12 kilometres of nesting sites. Along with the trees that provide nest hollows, the protection, management and increase of this feeding habitat that supports the breeding of Carnaby's cockatoo is a critical requirement for the conservation of the species (Parks and Wildlife, 2013).

The Carnaby's cockatoo is also listed as endangered under the Western Australia's *Biodiversity Conservation Act 2016* (BC Act).

Forest red-tailed black cockatoo

The FRTBC is endemic to the southwest humid and sub-humid zones of southwest Western Australia and inhabits jarrah, karri and marri forests receiving more than 600 millimetres of annual average rainfall (DEC, 2008). The FRTBC occurs in one population of approximately 15,000 individuals and is known to nest in the large hollows of marri, jarrah and karri (Johnstone and Kirkby, 1999). The main identified threats to the FRTBC are illegal shooting, habitat loss through land clearing, nest hollow shortage and competition from other species (DEC, 2008; DEWHA, 2009).

FRTBC forage primarily on seeds of jarrah and marri in woodlands and forest, and edges of karri forests, including wandoo and blackbutt. They will also forage on Allocasuarina cones, fruits of *Persoonia longifolia* (Snottygobble) and *Corymbia haematoxylon* (Mountain Marri). Other less important foods include Blackbutt, Bullich, *Allocasuarina fraseriana, Hakea* spp., Tuart, *Eucalyptus decipiens* (Redheart Moit) and *E. lehmanni* (Bushy Yate).

Roosting habitat is defined as a suitable tree (generally the tallest) or group of tall trees, native or introduced, usually close to an important water source, within an area of quality foraging habitat within the range of each black cockatoo species which provide black cockatoos with shelter during the heat of the day and safe resting places at night (DoEE, 2017). Individual night roosting sites need suitable foraging habitat and water within six kilometres (EPA, 2019). Night roosting trees usually consists of tall jarrah, marri, blackbutt, tuart and introduced eucalypt trees or large trees on the edges of forests.

According to the recovery plan, habitat critical for survival of FRTBC comprises of habitat that is:

- currently occupied by the cockatoos;
- not currently occupied by the cockatoos due to recent fire but capable of supporting cockatoo populations when sufficiently recovered;
- of natural vegetation in which the cockatoos nest, feed and roost;
- of natural vegetation through which the cockatoos can move from one occupied area to another; and
- of suitable vegetation within the recorded range in which undiscovered cockatoo populations may exist (DEC, 2008).

Given the above, habitat critical to survival for these species include all marri, karri and jarrah forests, woodlands and remnants in the south-west of Western Australia receiving more than 600 mm of annual average rainfall (DEC, 2008).

FRTBC is also listed as vulnerable under the BC Act.

Douglas' Broad headed Bee

The Douglas' Broad headed Bee is listed as critically endangered under the EPBC Act. This species was previously resumed extinct until one female collected in 2015 in pristine Banksia woodland in Pinjar that is mapped as the Endangered Banksia Woodlands of the Swan Coastal Plain ecological community. Habitat preferences outside of Banksia woodland is largely unknown, but has been recorded pollinating *Philotheca spicata*, *Patersonia occidentalis*, two species of Stylidium, and a species of Scaevola. The threats identified to this species is vegetation clearing and land development., land degradation, fire, herbivore grazing and possibly the use of pesticides (TSSC, 2019).

The biology of *Hesperocolletes douglasi* is unknown, however, there are likely similarities with other genera within the colletid tribe Paracolletini, particularly Paracolletes and Trichocolletes (TSSC, 2019).

This species may not be detected during surveys because many general fauna surveys conducted for environmental impact assessment do not systematically survey for insects and are therefore, not adequately represented in survey results. Surveys may not detect the species if not conducted at the appropriate time of year or conditions are not optimal or there is not enough effort. Surveys must coincide with the time of year that adults have emerged. Food plants are required to be flowering. Climatic conditions may alter the bee flight times during a day. Repeated surveys are likely to be required to detect the species within a certain area (TSSC, 2019).

Banksia woodland of the Swan Coastal Plain TEC

On 16 September 2016, the former Commonwealth Department of the Environment and Energy (DotEE) listed the Banksia Woodland as endangered under the EPBC Act.

The Banksia Woodlands TEC is located in the southwest of WA and is largely restricted to the Perth and Dandaragan subregions of the SCP IBRA bioregion from around Jurien Bay in the north to Dunsborough in the south. It also extends into immediately adjacent areas on the Whicher and Darling escarpments (which lie within the Jarrah Forest IBRA bioregion), to the south and east, where pockets of banksia woodlands may also occur (TSSC, 2016). The approved conservation advice for this community states that the canopy of the ecological community is most commonly dominated or co-dominated by *Banksia attenuata* and/or *B. menziesii*. Other banksia species that may dominate include *B. prionotes* or *B. ilicifolia* (TSSC, 2016). If present, the emergent tree layer often includes marri, jarrah, or tuart. Other trees that may be present include E. todtiana, *Nuytsia floribunda*, *Allocasuarina fraseriana, Callitris arenaria*, *C. pyramidalis* and *Xylomelum occidentale* (TSSC, 2016). The understorey of the community typically contains a high to very high diversity of shrub and herb species that often vary from patch to patch (TSSC, 2016).

The areas considered critical to the survival of this TEC cover all patches that meet the key diagnostic characteristics and condition thresholds, plus the buffer zones, particularly where this comprises surrounding native vegetation. Additional areas that do not meet the minimum condition thresholds may also be critical to the survival of the TEC depending on factors such as size and shape, landscape linkages to other patches and landscape position, because they could retain some biodiversity or habitat values (TSSC, 2016).

The estimated pre-European extent of the Banksia Woodland TEC is 706,000 to 708,000 hectares (TSSC, 2016). The estimated extent remaining in 2015 was approximately 336,000 to 337,000 hectares indicating an overall decline of about 52 per cent. Approximately 81,800 hectares or 24 per cent of the remaining extent of the TEC is estimated to be protected in reserves. Based on available mapping, over 12,000 patches of the TEC occur with the median patch size being 1.6 hectares. Approximately 22 per cent of the extent remaining is comprised of patches less than 100 hectares in size (TSSC, 2016). Current rates of clearing are estimated at 0.34 per cent loss (by area) per year overall, but are much greater in the Perth metropolitan area, at approximately 1.2 per cent annually (Ritchie et al., 2021).

The ecological community provides habitat for many native plants and animals that rely on banksia woodlands for their homes and food. Remaining patches of the ecological community provide important wildlife corridors and refuges in a mostly fragmented landscape (TSSC, 2016).

Considerable research has been undertaken on plant diseases in banksia woodlands over the last 30 years. According to the Threat abatement plan for disease in natural ecosystems caused by *Phytophthora cinnamomi* (Commonwealth of Australia, 2018), banksia woodlands are susceptible to Phytophthora dieback. Ritchie et al., (2021) states that other pathogens, such as *Armillaria luteobubalina* (Australian honey fungus), have been recorded

in banksia woodlands of the Spearwood dune system but the most prolific and serious pathogen is *Phytophthora cinnamomi.*

Phytophthora cinnamomi disease centres are more commonly found in deeper soils where they can alter the root system to provide refugia for persistence. Many common plant families in banksia woodlands are susceptible to P. cinnamomi, including Proteaceae, Fabaceae, Ericaceae, Xanthorrhoeaceae and Zamiaceae, causing mortality by hydraulic failure, leading to changes in plant species abundance and community structure. The change in plant community composition and structure, and potential localised loss of key species can have flow- on effects for fauna dependent on specific habitat and food sources (Ritchie et al., 2021). ‘

The goal of the ‘Threat abatement plan for disease in natural ecosystems caused by *Phytophthora cinnamomi’* is to identify and protect environmental assets (threatened species and ecological communities listed under the EPBC Act and other matters of national environmental significance) from the impacts of P. cinnamomi. It integrates (Commonwealth of Australia, 2018):

- strategies to prevent Phytophthora from spreading into areas that are free of disease
- strategies to reduce the impacts in infested areas
- recovery actions for the conservation of biodiversity assets currently being impacted
- research actions towards mitigating the impact of Phytophthora dieback.

King Spider-orchid (*Caladenia huegelii*)

The King Spider-orchid is listed as critically endangered under the EPBC Act due to the severe fragmentation of populations and the continuing decline in the extent of occurrence, area of occupancy, quality of habitat and the number of locations (DEC, 2009b). This flora species is found within the Jarrah Forest and the Swan Coastal Plain IBRA regions within 20 kilometres of the coast, from just north of Perth to the Busselton area over a distance of over 250 kilometres. *Caladenia huegelii* is a perennial herb with green, cream and red flowers, associated with woodlands over low heath or shrub, dominated by Eucalyptus spp., *Agonis flexuosa* (peppermint) or Banksia spp., within brown to grey sandy soils in the Bassendean sand-dune system (Western Australian Herbarium, 1998-). Throughout the species range (Wanneroo to Busselton), it tends to favour areas of dense undergrowth.

King Spider-orchid is associated with mixed woodland of jarrah, Banksia spp., Allocasuarina spp., and marri, over dense shrubs including *Stringia latifolia*, *Hypocalymma robustum*, Hibbertia spp., *Xanthorrhoea preissii*, Adenanthos spp., and Conostylis spp.; favours dense undergrowth growing on grey-white sand, sometimes yellow calcareous sands (Western Australian Herbarium, 1998-).

Glossy-leafed Hammer Orchid (*Drakaea elastica*)

The Glossy Spider-orchid is listed as endangered under the EPBC Ac due to habitat loss, fire, invasive weeds, grazing animals and salinity. This orchid species occurs in south-west Western Australia and grows only at 42 locations within a total population size of around 230 plants. Glossy-leafed Hammer Orchid is found within the Swan Coastal Plain IBRA region over a range of approximately 350 km between Cataby in the north and Busselton in the south.

This species is a described as a tuberous, perennial, herb, growing up to 0.12-0.3 metre high with red, green and yellow flowers In October to November. This species is associated with Banksia or Eucalyptus woodland, often associated with *Kunzea* sp. in thickets or tall shrubland growing on white-grey sand (DEC, 2009a). Similar to many orchids found in the south-west WA, Glossy-leafed Hammer Orchid dies back to an underground storage tuber during the dry summer months and resprouts following the onset of autumn rains (DEC, 2009a).

2.2 Summary of impacts

Carnaby’s cockatoo and Forest red-tailed black cockatoo

The application area is mapped within the modelled distribution of Carnaby’s cockatoo, and the FRTBC. For the remainder of the decision report, the term ‘black cockatoos’ refer to both species.

The seasonal movements of black cockatoos mean they require large areas of habitat for breeding, night roosting and foraging, as well as connectivity between these habitats to assist their movement through the landscape (Commonwealth of Australia, 2012).

Available databases indicate that there are 31 black cockatoo roost sites records within the local area (10 km radius) with the closest being approximately 994 metres from the application area. There are no white-tailed black cockatoo breeding sites mapped within a 12-kilometre buffer from the application area, the closest being approximately 13 kilometres from the application area.

During the fauna survey (Ecoscape, 2022), significant habitat for Carnaby's cockatoos and suitable low quality habitat for the FRTBC were observed. No sighting or evidence of use of the application area by the black cockatoos were recorded during the black cockatoo habitat assessment. However, the survey mentioned that secondary evidence in the form of chewed marri nuts and sightings by locals indicate that Carnaby's cockatoos use this area (Ecoscape, 2022). The black cockatoo habitat survey provided a score out of 10 for the black cockatoo species in relation to fauna habitat type and the site context as outlined in the table below.

Table 1: Black cockatoo habitat scores of vegetation types that occur within the application area.

Score	Carnaby's Cockatoo		Forest Red-tailed Black-Cockatoo	
Fauna Habitat Type	*Banksia* woodland	*Melaleuca* woodland	*Banksia* woodland	*Melaleuca* woodland
Site condition	5	1	1	2
Site context	2	2	0	0
Species density/stocking rate	1	1	0	0
TOTAL SCORE	**8**	**4**	**1**	**2**

There are 279 records of Carnaby's cockatoo and one record of FRTBC in the local area, with the closest being approximately 0.47 kilometres and 9.74 kilometres from the application area, respectively.

Based on the results of a black cockatoo habitat assessment undertaken as part of the fauna survey (Ecoscape, 2022), majority of the application area represents suitable foraging habitat for black cockatoos. The Banksia woodland within the survey area scored a quality score of eight out of ten for the Carnaby's cockatoo foraging habitat and one out of ten for FRTBC foraging habitat, while the melaleuca woodland scored a quality score of four out of 10 for Carnaby's foraging habitat and two out of ten for the FRTBC (Ecoscape, 2022).

According to the survey findings, there is limited roosting habitat for the black cockatoos within the application area. No evidence of roosting was observed during the survey (Ecoscape, 2022). Based on the available information and noting the abundant vegetation within the surrounding of the application area, the department considered that the proposed clearing will not result in a significant impact on black cockatoo roosting habitat.

During the survey, a total of two marri trees that met the Diameter at Brest Height (DBH) of 50 centimetres were recorded within the application area. Both of the marri trees were classified as class five, meaning no hollows suitable for black cockatoos are currently present (Ecoscape, 2022).

Table 2: Attributes of the black cockatoo habitat trees mapped within the application area.

Tree number	Tree species	DBH (mm)	Number of hollows	Tree class	Bees present	Easting	Northing
M1	*Corymbia calophylla* (Marri)	630	0	5	No	388249.685	6501926.751
M2	*Corymbia calophylla* (Marri)	690	0	5	No	388232.920	6501924.242

In addition to the above direct impacts, the department has considered that indirect impacts to black cockatoos utilising the surrounding vegetation is also likely. The increase in noise due to the operation of rifles and an increased number of people in this area may discourage the black cockatoos to continue the use of the surrounding vegetation.

Douglas' Broad headed Bee (*Hesperocolletes douglasi*)

According to the information from the threatened species nomination form, a specific management action to prevent negative impact to this species is to avoid activities that impacts on the Banksia woodland in the vicinity to where the bee was captured (TSSC, 2019).

According to the available databases, the application area is mapped 2.83 kilometres from the Douglas' Broad headed Bee record that was identified at Pinjar. Given the proposed clearing is predominately of banksia woodland it is considered to represent critical habitat for this species.

The fauna survey that was conducted to support this clearing permit application did not include invertebrates as part of the survey scope. Further surveys would be required to identify the presence/absence of this species within the application area.

Banksia woodland of the Swan Coastal Plain TEC

The assessment of the potential impacts of the proposed clearing on the Banksia Woodland TEC identified that the proposed clearing would result in the loss of approximately 4.9 hectares of native vegetation which represents the Banksia Woodland TEC. One vegetation type in the application area (BaXpEp) was found similar to vegetation communities of the nationally protected Banksia Woodland TEC.

The floristic analysis undertaken as part of the flora survey by Anders (2023), identified that the vegetation type VT1 (BaXpEp), which comprised of 4.9 hectares of the application area, were commensurate with the 23b – Swan Coastal Plain Northern *Banksia attenuata* – *Banksia menziesii* woodlands. SCP23b is a component of the Banksia Woodlands of the Swan Coastal Plain ecological community and based on the vegetation condition thresholds, the vegetation mapped as VT1 – BaXpEp is part of the Banksia Woodlands of the Swan Coastal Plain TEC (Anders, 2023). According to the survey results, approximately 339 hectares of the survey area is determined to represent the Banksia woodland of the swan coastal plain ecological community (Anders, 2023).

The key diagnostic characteristics, condition thresholds and minimum patch sizes for this TEC are included in the approved conservation advice for this community. Patches need to meet the key diagnostic characteristics, condition thresholds and minimum patch sizes to be the Banksia Woodland TEC. The vegetation type was therefore assessed against the key diagnostic characteristics and condition thresholds.

Based on the key diagnostic characteristics (TSSC, 2016), the vegetation community BaXpEp has been determined to represent the Banksia Woodland TEC as it met the following criteria:

- located on the SCP, on the Bassendean system, and consisted of a low woodland dominated by the key diagnostic species, being *Banksia attenuata* and B. menziesii
- met the minimum good condition category as all patches of this vegetation type were rated as either good (Keighery, 1994) or very good (Keighery, 1994)
- some of the patches of BaXpEp mapped in the SCP section of the application area met the minimum patch size for the relevant condition (must be a minimum of two hectares in good (Keighery, 1994) condition and one hectare in very good (Keighery, 1994) condition) when considered in isolation from surrounding vegetation.

Several areas of potential *Phytophthora cinnamomi* were identified within the BaXpEp vegetation type, with characteristic evidence of Banksia's dying back. This was identified in the northern and eastern areas of the survey area in proximity to existing cleared tracks for vehicle access (Anders, 2023). If these areas are used to access the application area for the purpose of clearing and the development activities, it is likely that *Phytophthora cinnamomi* may spread into the uninfested areas of the property as the disease can spread by root-to-root contact, human activities such as clearing with any mechanised equipment have the capacity to move it faster than any other means of spread.

King Spider-orchid (*Caladenia huegelii*) and Glossy-leafed Hammer Orchid (*Drakaea elastica*)

Based on the vegetation present within the application area, it is likely that suitable habitat for the King Spider-orchid and the Glossy-leafed Hammer Orchid is present within the application area. A detailed spring survey was conducted to detect conservation significant flora species within the application area. The survey was conducted between 3 and 4 October 2022. No individuals of the King Spider-orchid or the Glossy-leafed hammer orchid was identified during the flora survey. However, given these species persists as an underground tuber, multiple surveys are recommended to detect the presence/absence of these species.

A flora spring flora survey was scheduled for early October 2024 to search for the presence of *Caladenia huegelii* within the application area. However, a prescribed burn of this area was conducted prior to the survey. Any ground parts of these individuals would have been removed from the survey during the burn (Plantecology consulting, 2024). Therefore, an additional survey could not be undertaken to search for this species.

The applicant commissioned for an additional winter flora survey to be conducted within the application area, which was undertaken in April 2024, and found no *Drakaea elastica* within the application area (SSAAWA, 2024; Plantecology consulting, 2024).

Based on the above efforts, it is unlikely that these flora species occur within the application area. However given the conservation status of this species, it is considered that all known habitat for wild and translocated populations is habitat critical to the species survival.

2.3 Public consultation

SSAAWA has advised that the following stakeholder consultation events have occurred (SSAAWA, 2023b):

- Consultation with DBCA at number of occasions.
- Consultation with DPLH regarding Planning application.
- Consultation with Coterra Environmental.
- Department of Water and Environmental Regulation's Water Protection Branch.

The proposed action was advertised on the Department website on 10 April 2024 with a 21-day submission period. No public submission was received in relation to this application.

2.4 Avoidance and mitigation

SSAAWA has advised that the following measures have been considered to avoid and mitigate the impact of the proposed clearing.

Avoidance and consideration of alternatives
SSAAWA has considered alternative sites for this project however, none of these sites were suitable because (Coterra Environmental, 2023):

- The necessity for a safe distance between each of the shooting ranges. Hence, the application area could not be placed at an alternative location on site away from the wellhead protection zone.
- The location of the shooting rage needs to consider the public safety. The area to the north of the application area is locked up and has no access to the public making it an ideal place to situate the shooting range.
- The SSAAWA considered locating the shooting range at locations where other shooting ranges currently exists. However, the existing facilities had no further capacity.

Table 3: Alternative sites considered by SSAAWA.

Alternative Site	Reasoning for why site considered unsuitable
Jarrahdale Shooting Complex	Insufficient space to allow further expansion. Facility is already fully utilised.
Mundaring Marksmens Association	Insufficient space to allow further expansion, either laterally for additional ranges or in range length to support required calibres.
Port Bouvard Pistol & Small Bore Rifle Club	Insufficient space to allow further expansion, either laterally for additional ranges or in range length to support required calibres. Too far away from metropolitan area.
Gingin Pistol Club	Insufficient space to allow further expansion, either laterally for additional ranges or in range length to support required calibres. Too far away from metropolitan area.

- SSAAWA require the state shooting range to be located first on site to mitigate the public from proceeding any further along the access road. A fence would be installed to stop the public from accessing the other shooting ranges that are on site through the state shooting range. It was also advised that locating the proposed public shooting range within another site would have likely required a greater clearing area to accommodate core services which the current facility already has in place (Coterra Environment, 2023).

SSAAWA stated that the shooting range has been limited to only 100 metres wide to allow for a suitable area to safely undertake the sport, whilst not leaving any unutilized spaces. Further reduction to the clearing area and overall footprint was investigated and determined to either not be feasible or provide an acceptable outcome, due to the

nature of the sport and its safety requirements. However, there may be a possibility to reduce the application area by reducing the current length of the application area (Coterra Environment, 2023).

SSAAWA has informed the department that the nature of the proposed development requires significant buffers for safety of both the patrons and the general public. The proposed range needs to be located within an area where the general public can feasibly travel to, but admittance is controlled and prevents access to the private rifle ranges. It also needs to be located within a landscape which allows for noise and physical buffers to the sport (Coterra Environment, 2023). The lease area is surrounded by native bushland, which provides an ideal location for the proposed shooting range as the bushland, notably that existing to the northern boundary of the lease area, provides a natural buffer to any stray bullets.

The application area is located immediately south and west of the Australian Defence Force Pearce Airforce range. Access by the general public is heavily restricted in these areas allowing for a safe buffer between firearms being discharged and the boundary of the site. The SSAAWA has advised the department that SSAWA is not aware of any available space within the Perth Metropolitan Region which would allow for safe practice of the sport (SSAAWA, 2023b).

Mitigation

SSAAWA has advised that a Construction Environmental Management Plan will be prepared and implemented to protect the native vegetation adjacent to the development footprint and ensure no offsite impacts occur to the surrounding vegetation (Coterra Environment, 2023). The management plan will incorporate the following management measures.

- Prior to the commencement of clearing, the construction boundary between the development footprint and the adjacent vegetation will be surveyed and fenced to ensure it is accurately located and demarcated. This demarcation will ensure over-clearing does not occur.
- All personnel on site will undertake an induction, which will outline the environmental values of the site and the importance of remaining within defined clearing areas.
- Clearing outside of the main avifauna breeding season is recommended, if possible.
- Vegetation clearing will occur from a disturbed edge, where possible, to encourage any remaining fauna to naturally relocate to the adjacent vegetated area.
- A fauna handler will be present during on site during clearing activities to facilitate the capture and relocation of fauna.
- Fauna interaction register to be maintained and to capture observations and interactions with fauna.
- Proper disposal of domestic waste will be undertaken to prevent attraction of native fauna or feral animals into the construction site.
- Dust Management during construction
- Stabilisation of batters during construction to prevent sedimentation in the area to be retained.
- Management of surface hydrology to prevent run-off into surrounding areas.

The department is satisfied that SSAAWA has made a reasonable effort to avoid and minimise potential impacts for the proposed clearing on environmental values and made efforts to find an alternative location for the proposed works. The department also note that this proposed location is an ideal spot to construct the shooting range given the surround remnant vegetation acting as a safety buffer. However, the department has determined that the proposed clearing will result in an unacceptable impact to the environmental values present within the application area and the purpose of the clearing does not outweigh the significant impacts of the proposed clearing.

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2.5 Other relevant considerations

Economic and Social Matters

It was advised by SSAAWA that the *Firearms Act 2024* in Western Australia introduces stringent conditions on firearm ownership, including new licence categories, mandatory health assessments, and training requirements. These change in conditions have created an increase in demand for firearms clubs, as many owners now need to join clubs to meet the new legal requirements. Given the increased demand, the proposal for a new facility to support club activities is necessary. The new rifle range is proposed to help accommodate the growing number of members and ensure compliance with the new regulations and public safety are maintained (SSAAWA, 2023b).

It was further advised by the SSAAWA that a public shooting range is a highly sought after resource as there are no facilities within the vicinity of the complex that allow for public usage without memberships to specific clubs. The Wanneroo Shooting Complex management team receive weekly enquiries from firearm owners, enquiring about access to a facility to practice at and improve their skill sets (SSAAWA, 2023b).

The proposed public shooting range will provide the following benefits to members of the public (SSAAWA, 2023b):

- A cleared firing line that is 558 meters long by 100 meters wide.
- A cantilevered firing line space which is 90 meters wide and 10 meters deep.
- An administration building which will contain toilets, briefing rooms and administrative officers.
- Four sea container storage structures.
- Palisade fencing and gated entrance to front of development
- Hardstand area for trailer storage
- Bin storage area
- Unmarked car park area with a limestone base, with a capacity of 70 parked vehicles

Applicant's Environmental History

The SSAAWA has advised that SSAAWA has a satisfactory record of responsible environmental management and have no history of environmental irresponsible actions. The complex at Wanneroo that SSAAWA holds a lease for has been in operation since 1972 and there are no reported proceedings against the organization (SSAAWA, 2023b).

Details of consultation with Indigenous stakeholders

SSAWA advised the department that a search of the Department of Planning, Lands and Heritage (DPLH) (2023) Aboriginal Heritage Inquiry System (AHIS) and the InHerit database (State Heritage Office 2023) found no registered sites of Aboriginal or European significance occurring within the development footprint and lease area. As such, no specific public consultation with regard to heritage matters has been undertaken yet (SSAWA, 2023b).

Part 3: Assessment against clearing principles (in accordance with EP Act)

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

Proposed clearing is at variance with this Principle

Based on the assessment detailed below, the Delegated Officer determined that the proposed clearing would impact on native vegetation comprising a high level of biodiversity as the application area comprises:

- native vegetation which represents the Banksia Woodland TEC;
- native vegetation which represents FCT23B Swan Coastal Plain Northern *Banksia attenuata- Banksia menziesii* woodlands priority ecological community (PEC);
- significant foraging habitat for Carnaby's cockatoo and FRTBC which supports breeding and roosting individuals;
- native vegetation that provides suitable habitat for Quenda and Douglas's broad-headed bee; and
- suitable habitat for the threatened flora species *Caladenia huegelii* and *Drakaea elastica.*

Suitable habitat for the threatened flora species *Caladenia huegelii* and *Drakaea elastica* is present within the application area. However, given survey effort and season coverage (spring survey), if populations of Threatened flora taxa were present, it is expected that these flora species would have been identified by the survey.

The proposed clearing would result in the loss of 4.9 hectares of 'Banksia Woodland of the Swan Coastal Plain' TEC, listed as Endangered under the EPBC Act and which is also representative of the 'FCT23B Swan Coastal Plain Northern *Banksia attenuata- Banksia menziesii* woodlands', which is listed by the DBCA as a Priority 3 PEC (Anders, 2023).

The vegetation within the application area is predominantly in very good condition (Keighery, 1994), and as stated above, includes significant habitat for black cockatoos, is representative of the TEC Banksia Woodlands of the Swan Coastal Plain and the PEC, FCT23B Swan Coastal Plain Northern *Banksia attenuata- Banksia menziesii* woodlands', and contains habitat that is likely to support threatened flora. Given this, the proposed clearing is at variance to clearing principle (a).

Assessment

The application area is mapped within the Bassendean Complex-North 43, which is described as low open forest and low open woodland of Banksia species *Eucalyptus todtiana* (Pricklybark) to low woodland of Melaleuca species and sedgelands which occupy the moister sites.

A flora and vegetation survey was undertaken by Anders Environmental Consulting (2023). The survey included a detailed spring survey between 3 and 4 October 2022 and a reconnaissance survey between 21 and 22 April 2022. The survey area is comprised of the entire lease area of approximately 392 hectares which comprised of the clearing area of 100 metres by 600 metres representing approximately 6.02 hectares. Any flora species that were unable to be identified were collected for verification and identification with the Western Australian Herbarium specimens. DBCA taxonomists were consulted for identification of conservation significant species (Anders, 2023).

According to the flora and vegetation survey, *Banksia attenuata- B. menziesii* open woodland *over Xanthorrhoea preissii* mid sparse shrubland over *Eremaea pauciflora* low sparse shrubland was mapped across majority of the application area. This vegetation type was further separated into burnt and unburnt. Within the application area, burnt was the most dominant vegetation type occupying 68 per cent of the application area. Along the mapped watercourses that is within the application area, the vegetation is described as *Melaleuca preissiana* open woodland over *Xanthorrhoea preissii* mid sparse shrubland over *Dasypogon bromeliifolius* low sparse forbland (Anders, 2023). Condition of the vegetation within the application area ranged from good to very good (Keighery, 1994) (Anders, 2023).

Flora

According to the available databases, 13 priority flora species and four threatened flora species have been recorded within the local area. The time of the targeted flora survey undertaken by Anders (2023) is considered to be appropriate to identify majority of the flora species identified from the local area. The survey report noted that most species were flowering or beginning to fruit which assisted in identification of species, apart from four species (two Asteraceae sp., one Ericaceae and one Orchidaceae sp.), which were sterile and could only be identified to family level. The survey was undertaken in accordance with the technical guidance – Flora and Vegetation Surveys for Environmental Impact Assessment (Anders, 2023).

According to the survey results, a total of 102 vascular flora species from 34 families and 77 genera were recorded within the survey area. The families with the highest species representation were Asteraceae (12 species), Fabaceae (12 species), Myrtaceae (12 species), Proteaceae (9 species), and Ericaceae (6 species). All species recorded were endemic to the Swan Coastal Plain and no species occurred outside of their population range (Anders, 2023).

The targeted search for conservation significant flora within the entire application area as well as within suitable habitat in the wider survey area was undertaken. The focus of the survey was on species considered to have a 'High' likelihood of occurrence within the survey area. During the survey, outcropped and rocky areas and seasonally inundated wetter areas were examined. All four species mentioned above, that could not be identified to the genus level were confirmed to not represent conservation significant species upon further analysis (Anders, 2023).

No threatened or priority flora species were identified within the application area or the survey area (Anders, 2023). However, the department notes that the vegetation within the application area provides habitat for two threatened flora species and further survey work may be required to confirm the presence and the absence of these flora within the application area. This is further discussed under clearing principle (c).

Ecological community

Based on the available DBCA TEC database, the application area is mapped within Banksia Woodlands of the Swan Coastal Plain ecological community. An assessment of the impacts from the proposed clearing on the Banksia woodlands of the Swan Coastal Plain TEC is further discussed under clearing principle (d).

Fauna
The application area is considered to consist of significant foraging habitat for Carnaby's cockatoo and the FRTBC. The application may also be utilised by Woolybush bee, Western brush wallaby, Graceful summoth, Chuditch, Quenda and Douglas's broad-headed bee, that is further discussed under clearing principle (b).

Weeds and dieback
The majority of the application area contains a low level of weed invasion. Mechanical clearing has the potential to facilitate weed spread, which can decrease the biodiversity value of an area as weeds out-compete native vegetation for available resources, contribute to land degradation and increase the frequency and intensity of fires (DEC, 2011).

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

Proposed clearing is at variance to this Principle.

The impacts of the proposed clearing constitute a significant residual impact to black cockatoo species given the occurrence of high-quality foraging habitat.

Based on the below assessment, the proposed clearing will result in:

- clearing of 4.9 hectares of high-quality foraging habitat for Carnaby's and FRTBC species;
- clearing of two potential future breeding trees for black cockatoo species;
- clearing of vegetation that maybe used by ground dwelling fauna species;
- clearing of vegetation that is suitable habitat for the Critically Endangered (listed under the EPBC Act) Douglas' Broadheaded Bee (*Hesperocolletes douglasi*); and
- indirect impact through spread of weeds and dieback into adjacent fauna habitat.

Assessment

The desktop assessment identified 24 conservation significant fauna species from the local area including 12 birds, five invertebrate and seven mammal species. Many of the birds recorded within the local area are migratory birds associated with marine environment that are unlikely to occur within the application area.

Table 4: Records of conservation significant fauna species within 10 kilometres of the application area

Species scientific name	Species common name	Conservation status	Number of known records (total)	Distance of closest record to application area (km)	Did surveys identify? [Y, N, N/A]
Bettongia penicillata ogilbyi	woylie, brush-tailed bettong	CR	1	6.30	N
Calyptorhynchus banksii naso	forest red-tailed black cockatoo	VU	1	9.34	N
Dasyurus geoffroii	chuditch, western quoll	VU	1	6.30	N
Falco peregrinus	peregrine falcon	OS	8	6.33	N
Hesperocolletes douglasi	Douglas's broad-headed bee	CR	1	2.83	N
Hylaeus globuliferus	woolybush bee	P3	5	8.30	N
Isoodon fusciventer	quenda, southwestern brown bandicoot	P4	44	5.73	N – digging identified
Leioproctus contrarius	a short-tongued bee	P3	1	7.61	N
Notamacropus irma	western brush wallaby	P4	4	6.25	N
Petrogale lateralis lateralis	black-flanked rock-wallaby, black-footed rock-wallaby, moororong	EN	1	6.30	N
Pseudomys shortridgei	heath mouse, heath rat, dayang	VU	1	7.08	N
Synemon gratiosa	graceful sunmoth	P4	4	7.72	N
Zanda latirostris	Carnaby's cockatoo	EN	279	0.47	N
Zanda sp. 'white-tailed black cockatoo'	white-tailed black cockatoo	EN	29	5.91	N

A terrestrial vertebrate fauna survey was conducted within the application area on 20 April 2022, which also included a black cockatoo habitat survey (Ecoscape, 2022). According to the survey, two fauna habitats were recorded within the application area, that are:

- Open Banksia woodland over shrubs and sedges (4.87 ha). According to the survey report, this habitat is considered to be suitable for a range of small mammals, reptiles and woodland birds. It was also identified that this habitat was significant foraging habitat for the Carnaby's cockatoos (Ecoscape, 2022).
- Open Melaleuca low woodland with scattered Marri trees over shrubs. According to the survey report, this habitat is considered suitable for a range of small mammals, reptiles and woodland birds. It was also identified that this habitat consists of significant roosting and foraging habitat for black cockatoos (Ecoscape, 2022).

In forming a view on the likelihood of fauna species occurring within the application area, the preferred habitat types and typical home ranges of these species and their recorded proximity to the application area were considered, along with the type and condition (Keighery, 1994) of the vegetation within the application area. The application area may contain suitable habitat for the following fauna species:

- *Zanda latirostris* (Carnaby's cockatoo)
- *Calyptorhynchus banksii* subsp. naso (Forest red-tailed black cockatoo)
- *Dasyurus geoffroii* (Chuditch)
- *Isoodon fusciventer* (Quenda)
- *Macropus Irma* (Western Brush Wallaby)
- *Hylaeus globuliferus* (Woolybush bee)
- *Hesperocolletes douglasi* (Douglas's broad-headed bee)
- *Synemon gratiosa* (Graceful summoth)

Carnaby's black cockatoo and Forest red-tailed black cockatoo– endangered/vulnerable

Impacts to Carnaby's black cockatoo and the FRTBC are outlined in the assessment of the potential impacts on Matters of National Environmental Significance in Part 2.2 of this report.

The application area is located in the Swan Coastal Plain which is an extensively cleared area and an area used by black cockatoos primarily for foraging resources. A key focus for this region is the ongoing viability of foraging resources for black cockatoos, particularly the Carnaby's cockatoos (DAWE, 2022). Noting this, the findings that are detailed under Part 2.2 of this report and the site context, it is considered that the application area provides high quality foraging habitat for Carnaby's black cockatoos and low-quality foraging habitat for the FRTBC. The proposed clearing would result in a significant residual impact to black cockatoos.

Quenda – Priority 4

The quendas are ground dwelling marsupials that tend to inhabit forest, woodland and heathland, usually with dense understorey vegetation, sometime wetland fringes. They forage for plant material, fungi and insects by digging in leaf litter and soil (DBCA, 2017). In their natural habitat, Quenda's live in dense understories in swampland areas, Banksia and Jarrah woodlands. However, Quendas have adapted to urban and suburban habitats in recent years (DBCA, 2017).

According to available databases, the nearest record is approximately 5.73 kilometres from the application area with 44 records identified in the local area. Secondary evidence of Quenda in the form of digging was observed during the fauna survey (Ecoscape, 2022). Given the extent of the clearing proposed, and the amount of remnant native vegetation immediately adjacent to the application area, it is not considered that the proposed clearing would result in a significant residual impact on the availability of habitat for Quenda.

Chuditch – Threatened

The chuditch/western quoll is listed as vulnerable under both BC Act and the EPBC Act. Chuditch are present in approximately five per cent of their former range, with most chuditch now found in varying densities in jarrah forests and woodlands in the southwest corner of Western Australia, in woodlands, mallee shrublands and heaths along the south coast, east to the Ravensthorpe area, and at lower densities in drier woodland and mallee shrubland in the Wheatbelt and Goldfield regions. Chuditch require large areas of intact habitat to survive and are rarely found where habitat is severely fragmented by clearing, except as transient visitors (DEC, 2012).

Suitable habitat for the chuditch may be present within the wetland vegetation mapped to the north of the application area. Given the dense condition of the vegetation, it is likely that the Chuditch maybe utilising the application area and is likely to be a transient visitor throughout the application area. However, given the abundant vegetation

surrounding the application area, it is unlikely that the proposed clearing would significantly impact on the Chuditch habitat.

Western Brush Wallaby – Priority 4

The western brush wallaby is listed as a priority four fauna species by DBCA and this species inhabits open forest or woodland, particularly favouring open, seasonally wet flats with low grasses and open scrubby thickets. It is also found in some areas of mallee and heathland (DEC. n.d).

The small area of Melaleuca habitat that is identified within the application area is likely to provide suitable habitat for Western Brush Wallaby. However, noting that this species is highly mobile and does not rely on specialist niche habitats (DEC, n.d), the proposed clearing is not likely to impact on significant habitat for this species. No evidence of this species using the application area was recorded during the survey (Ecoscape, 2022).

Woolybush bee – Priority 3

The woolybush bee, listed as Priority 3 by DBCA, favours flowers of *Adenanthos cygnorum* for feeding but has also been recorded on *Banksia attenuata* (Houston, 2018). The application area consists of *B. attenuata* and is likely to also include *Adenanthos cygnorum*. Woolybush bee is highly mobile and have access to suitable habitat adjacent to the application area. The closest record of woolybush bee is recorded approximately 8.29 kilometres from the application area. The application area provides habitat for this species however, noting the availability of similar habitat in the local area, the proposed clearing is not likely to have a significant impact on the woolybush bee.

Graceful summoth

Graceful sunmoth is associated with two habitat types:

a) Coastal heathland on Quindalup dunes, where it is restricted to secondary sand dunes where the host plant *Lomandra maritima* is locally abundant; and
b) Banksia woodland on Spearwood and Bassendean dunes, where the second known host plant *L. hermaphrodita* is widespread (DEC, 2011).

Noting the vegetation identified within the application area (Anders, 2023), the application area provides suitable habitat for this species. There are four records of this species recorded within the local area, with the closest record identified 7.72 kilometres from the application area. Graceful summoth is known from 842 records with distribution of approximately 600 kilometres north-south and 42 kilometres east-west. Taking into consideration the known distribution of the species, its mobility and the extent of vegetation which will remain in the surrounding area, the application area is unlikely to provide significant habitat for graceful summoth.

Douglas's broad-headed bee – Threatened

Impacts to Douglas's broad-headed bee are outlined in the assessment of the potential impacts on Matters of National Environmental Significance in Part 2.2 of this report.

Conclusion

The proposed clearing would result in the loss of 6 hectares of high-quality foraging habitat for the Carnaby's cockatoo and low-quality foraging habitat for the FRTBC. This habitat is considered significant due to evidence in the form of chewed marri nuts being identified during the fauna survey and the number of roost sites that occur within the local area (31), indicating that the foraging habitat is considered likely to support nearby individuals that roost in the locality.

Given the abundant vegetation in mostly very good condition (Keighery, 1994) in the surrounding area, impacts to other ground dwelling fauna are not considered so significant.

The fauna survey undertaken by the Ecoscape (2022) did not include invertebrates as part of the survey scope. According to the desktop assessment the proposed clearing may impact on suitable habitat for the Critically Endangered (listed under the EPBC Act) Douglas' Broad headed Bee. Further surveys would be required to identify the presence/absence of this species within the application area.

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

Proposed clearing may be at variance to this Principle

The department notes that the vegetation within the application area provides habitat for two threatened flora species and further survey work may be required to confirm the presence and the absence of these flora within the application area.

Caladenia huegelii flowers from September to October, and outside of this period, persists as an underground tuber (DEC, 2009a). A spring flora survey was scheduled for early October 2024 to search for the presence of *Caladenia huegelii* within the application area. However, a prescribed burn of this area was conducted prior to the survey. Any ground parts of these individuals would have been removed from the survey during the burn (Plantecology consulting, 2024). Therefore, an additional survey could not be undertaken to search for this species.

Drakaea elastica is currently known only from the Swan Coastal Plain over a range of approximately 350 kilometres between Cataby in the north and Busselton in the south. The species grows on bare patches of sand within otherwise dense vegetation in low-lying areas alongside winter-wet swamps, typically in banksia (*Banksia menziesii*, *B. attenuata* and *B. ilicifolia*) woodland or spearwood (*Kunzea glabrescens*) thicket vegetation (DEC, 2009b). The SSAAWA has advised that an additional winter flora survey was recently undertaken in April 2024, which found no *Drakaea elastica* within the application area (SSAAWA, 2024; Plantecology consulting, 2024). A map of the survey effort to detect these species is represented by Figure 14 of Appendix B.7

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

Proposed clearing is at variance to this Principle

One TEC listed under the BC Act is mapped within the local area, that is *Melaleuca huegelii* - M. systena shrublands of limestone ridges (floristic community type 26a as originally described in Gibson et al. 1994). This community was mapped approximately 6.7 kilometres southwest of the application area. The vegetation within the application area is not representative of this TEC.

The area proposed to be cleared does not contain species that can indicate a TEC listed under the BC Act.

The vegetation proposed to be cleared is mapped within an area identified as Banksia woodlands of the Swan Coastal Plain which is listed as Endangered under the EPBC Act. The approved conservation advice for the PEC/TEC states that to be considered representative of the PEC/TEC, a remnant in the Swan Coastal Plain bioregion must include at least one of four Banksia species being *Banksia attenuata* (candlestick banksia), *B. menziesii* (firewood banksia), *B. prionotes* (acorn banksia) and/or *B. ilicifolia* (holly-leaved banksia); must include an emergent tree layer often including marri, jarrah, or tuart, and other medium trees including *Eucalyptus todtiana* (pricklybark), *Nuytsia floribunda* (WA Christmas tree), western sheoak, *Callitris arenaria* (sandplain cypress), *Callitris pyramidalis* (swamp cypress) or *Xylomelum occidentale* (woody pear); and must include an often highly species-rich understorey (TSSC, 2016).'

According to the survey, the following conservation significant ecological communities had a 'high' likelihood of occurrence within the application area:

- Banksia woodlands of the Swan Coastal Plain ecological community – Endangered (federal), Priority 3 (WA).
- *Eucalyptus gomphocephala* (Tuart) Woodlands and Forests of the Swan Coastal Plain ecological community – Critically endangered (federal), Priority 3 (WA).
- SCP21c – *Banksia attenuata* - *Melaleuca preissiana* low-lying woodlands or shrublands, occurs on the Bassendean system – Endangered (federal), Priority 3 (WA).
- SCP22 – *Banksia ilicifolia* – *Banksia attenuata* woodlands, *Melaleuca preissiana* woodlands and scrubs are also recorded, central Swan Coastal Plain – Endangered (federal), Priority 3 (WA).
- SCP23b – *Banksia attenuata* - *Banksia menziesii* woodlands, Swan Coastal Plain– Endangered (federal), Priority 3 (WA).

During the flora and vegetation survey, the key diagnostic characteristics of the above ecological communities were considered. Based on the survey results, the following conservation significant ecological communities were identified within the application area (Anders, 2023).

- Banksia woodlands of the Swan Coastal Plain ecological community. Approximately 4.90 hectares of the application area is representative of this ecological community.

- FCT SCP23b - Swan Coastal Plain Northern *Banksia attenuata - Banksia menziesii* woodlands.

In order to be representative of the FCT SCP23b, a patch usually contains a distinctive upper sclerophyllous layer of trees typically dominated or co-dominated by one or more of the listed Banksia species and often highly species-rich understorey (DEE, 2016).

The proposed clearing will involve clearing approximately 4.901 hectares of very good condition (Keighery, 1994) VT1 - BaXpEp (burnt and unburnt) which was determined to be PEC - SCP23b - Swan Coastal Plain Northern *Banksia attenuata - Banksia menziesii* woodlands. SCP23b is a component of the Banksia Woodlands of the Swan Coastal Plain ecological community and based on the vegetation condition thresholds the vegetation mapped as VT1 – BaXpEp is part of the Banksia Woodlands of the Swan Coastal Plain ecological community (Anders, 2023).

Based on the above assessment, the proposed clearing would remove native vegetation that is representative of Banksia woodlands of the Swan Coastal Plain and therefore is at variance with clearing principle (d).

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

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

The extent of the mapped vegetation type and the 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.

Assessment

The application area is located within the Swan Coastal Plain IBRA bioregion. The Swan Coastal Plain bioregion has approximately 38 per cent of its pre-European extent remaining (Government of Western Australia, 2018). The local area retains approximately 54.4 per cent (approximately 17,838 hectares) pre-European vegetation extent, a large portion of which is contained within Bush Forever sites.

The national objectives and targets for biodiversity conservation in Australia has a target to prevent clearance of ecological communities with an extent below 30 per cent of that present pre-1750, below which species loss appears to accelerate exponentially at an ecosystem level (Commonwealth of Australia, 2001). None of the vegetation extents are below the 30 per cent threshold (Government of Western Australia, 2018). On this basis the application area is not located within an extensively cleared landscape.

Table 5: Vegetation extent remaining statistics

	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*					
Swan Coastal Plain	1,501,221.93	579,813.47	38.62	222,916.97	14.85
Vegetation complex					
Bassendean Complex-North 43	79,057.35	56,659.67	71.67	30,558.65	38.65
Local area					
10km radius	32,818	17,838	54.4	-	-

*Government of Western Australia (2019a)
**Government of Western Australia (2019b)

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

Proposed clearing is at variance to this Principle

A multiple use wetland is mapped across the northern extent of the application area (0.496 ha). DBCA has advised that the vegetation mapped within the wetland area occurs in a good or better (Keighery, 1994) condition and that this portion of the wetland is likely to meet criteria for conservation category.

A minor river also runs parallel to the application area. The proposed clearing will include the removal of riparian vegetation.

Assessment

According to available databases, a strip of vegetation to the north of the application area is mapped within the Geomorphic Wetlands Swan Coastal Plain dataset as a multiple-use wetland with the Unique Feature Identifier (UFI) 15809. UFI 15809 is characterised as a seasonally waterlogged flat that forms part of an extensive wetland system that extends along the Swan Coastal Plain from Boyanup in the northeast down to Carbunup River to the west (Water and Rivers Commission, 2001). The clearing is proposed to occur within 0.496 ha of the Lake Pinjar multiple use wetland in very good (Keighery, 1994) condition.

Multiple use category wetlands are wetlands with few important ecological attributes and functions remaining. Use, development and management should be considered in the context of ecologically sustainable development and best management practice catchment planning through landcare (Water and Rivers Commission, 2001).

Although the wetland is mapped as a multiple use wetland, given the good to very good (Keighery, 1994) vegetation condition and in accordance with criteria 5 of the “A methodology for the evaluation of wetlands on the Swan Coastal Plain”, the vegetation within the application area is likely to meet the ‘conservation category wetland (CCW)’. It was advised by the DBCA that further delineation and evaluation of the wetland is recommended to be undertaken to determine the extent and the value of the wetland (DBCA, 2023). The protection of conservation significant wetlands includes the provision of a wetland buffer. This is crucial to maintain or improve wetland values such as surface water quality and hydrological regime (DBCA, 2023). The application in its current form does not consist of a buffer to the potential CCW wetland vegetation recorded within the application area.

The flora and vegetation survey recorded vegetation described as *Melaleuca preissiana* open woodland along a minor river mapped to the north of the application area (Anders, 2023). The clearing will, therefore, include the removal of vegetation growing in association with this watercourse and wetland.

As mentioned above, the vegetation within the application area is in good to very good condition (Keighery, 1994), and no sign of fragmentation of the vegetation is identified. Therefore, the impacts of the proposed clearing on the mapped wetland and the riparian vegetation are likely to be significant. The proposed clearing is at variance to this principle.

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

Proposed clearing is likely to be at variance to this Principle

A review of the land degradation risks of the mapped soils (DPIRD, 2019) indicated that some soils mapped within the application area have an elevated risk of wind erosion, water erosion, waterlogging, phosphorus export risk and flooding.

Given the topography of the application area is relatively flat throughout, with elevations of 56 meters Australian Height Datum (AHD) at the southern end to 60 meters AHD at the northern end, the risk of waterlogging and phosphorus export is considered to be low at this location.

Subsurface acidity is the acidification of the soil acidity, which develops between 10 to 35 centimetres in soil. The key environmental factors that can affect the difference in pH between surface and subsurface layers are soil fertility, initial soil pH profile before clearing, rainfall and fluctuations in soil moisture content. In the subsurface (10-30 cm) layers, low pH causes an increase in the solubility of aluminium, which is toxic to plant roots, resulting in restricted root growth and poor access to moisture and nutrients. Photographs of the vegetation (see Appendix B) do not display any growth characteristics that are common of vegetation growing in association with subsurface acidification.

Given the size of the proposed clearing and sandy soils present with the application area, it is considered for the proposed clearing is likely to cause appreciable land degradation in the form of wind erosion.

Assessment
The application area lies within the Bassendean system of the Swan Coastal plain, that is described as sand dunes and sandplains with pale deep sand, semi-wet and wet soil associated with banksia-paperbark woodlands and mixed heaths.

The application area has been mapped as the following land units – land subsystem (DPIRD, 2019):

- Bassendean, Jandakot Phase which is described as Jandakot low dunes. Slopes less than 10 per cent and generally more than 5 meters relief. Grey sand over pale yellow sands generally underlain by humic and iron podsols; Banksia species. low open woodland with a dense shrub layer.
- Bassendean drainage lines Phase, which is described as Broad, shallow channels, peaty soils, fringe of Melaleuca spp. and E. rudis; reeds and sedges in central zone.

The Department of Primary Industry and Regional Development (DPIRD) developed land degradation risk potentials for mapped subsystems, as shown within the Table 6 below:

Table 6: Land degradation risks for mapped soil units (DPIRD, 2019).

Risk categories	Bassendean, Jandakot Phase	Bassendean drainage lines Phase
Wind erosion	68% of map unit has a high to extreme hazard	0% of map unit has a high to extreme hazard
Water erosion	0% of map unit has a very high to extreme hazard	100% of map unit has a very high to extreme hazard
Salinity	0% of map unit has a moderate hazard	0% of map unit has a moderate hazard
Flood risk	0% of the map unit has a moderate to high hazard	100% of the map unit has a moderate to high hazard
Water logging	0% of map unit has a moderate to very high risk	100% of map unit has a moderate to very high risk
Phosphorus export risk	80% of map unit has a high to extreme hazard	100% of map unit has a high to extreme hazard

Taking into account the extent of the proposed clearing, mapped land degradation risks and sandy soils present, the proposed clearing is likely to cause appreciable land degradation.

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

Proposed clearing is at variance to this Principle

The proposed clearing would result in the loss of six hectares of native vegetation within Bush Forever Site 380, that is the Rosella Road bushland, Bullsbrook conservation area.

Assessment
The proposed clearing area is within an Environmentally Sensitive Area and Bush Forever 380. The majority of the site 380 within the application area is described as banksia open woodland in good to very good (Keighery, 1994) condition (Anders, 2023). According to the surveys undertaken within the application area, no threatened or priority listed flora species by the DBCA were recorded within the application area (Anders, 2023). The vegetation however is representative of the PEC, low lying *Banksia attenuata* woodlands or shrublands and the TEC Banksia Woodland of the Swan Coastal Plain. The vegetation proposed for clearing also provide significant habitat for conservation significant fauna species.

Given the predominately very good (Keighery, 1994) condition of the vegetation, and noting all of the above, it is considered that the proposed clearing is likely to have a significant residual impact on the Bush Forever Site, in accordance with the Western Australian State Planning Policy 2.8 (SPP 2.8).

SPP 2.8 sets out that:
'Proposals or decision-making' in respect of Bush Forever areas 'should:

(i) support a general presumption against the clearing of regionally significant bushland or other degrading activities, except where a proposal or decision –

a. is consistent with the overall purpose and intent of an existing Crown reserve or can be reasonably justified with regard to wider environmental, social, economic or recreational needs, and all reasonable alternatives have been considered in order to avoid or minimise any direct loss of regionally significant bushland, and reasonable offset strategies are secured to offset any loss of regionally significant bushland, where appropriate and practical (clause 5.1.2.1(i)(e)).

The department sought advice from DPLH in regard to the impacts the proposed clearing would have on the conservation values of the Bush Forever site 380. DPLH has advised that the proposed clearing is not in accordance with the SPP 2.8 Appendix 2(ix)(b) which recommend that activities within Bush Forever Sites should avoid unacceptable losses to TEC's and species listed under the EPBC Act. DPLH further advised that the overall intent of the site is for conservation purposes given its status as state forest, Bush Forever area and a Water Catchment (DPLH, 2023).

Conclusion

Based on the above, the proposed clearing would result in the loss of six hectares of good to very good (Keighery, 1994) condition native vegetation within Bush Forever Site 380, that is the Rosella Road bushland, Bullsbrook conservation area. This parcel of bush forever vegetation is representative of a TEC, supports conservation significant fauna species and a portion of the vegetation is also likely to meet a CCW. The department considered that clearing of this vegetation would result in a significant residual impact on Bush Forever site 380 and is therefore, at variance with clearing principle (h).

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

Proposed clearing is at variance to this Principle

Given the application area is mapped within a Public Drinking Water Source area, the proposed clearing may impact surface or ground water quality. Given the existing level of groundwater salinity and the size of the application area, the proposed clearing is not likely to cause any further deterioration in the quality of groundwater through salinity in the local area.

Assessment

According to available databases, the application area does not transect any water resources proclaimed under either the:

- *Country Areas Water Supply Act 1947*, or
- *Metropolitan Water Supply Sewerage and Drainage Act 1909*.

As discussed under clearing principle (f), a geomorphic wetland and a watercourse have been mapped within the application area. The mapped watercourse is non-perennial and the flow of water in this watercourse is likely to be associated with rainfall patterns. Hence, the impact to the quality of water in this watercourse is limited to short-term increases in sedimentation and turbidity, and are not likely to be significant.

No direct impacts to groundwater are anticipated as the SSAAWA will not carry out any drawdown activities.

According to the available databases, the application area is mapped within Gnangara Groundwater Area. Groundwater salinity in the application area is mapped as 500 milligrams per litre total dissolved solids, which is considered as fresh. The proposed clearing will include removing deep-rooted trees. However, it is noted that only two trees within the application area have a DBH greater than 50 centimetres (Anders, 2023). Therefore, the proposed clearing is unlikely to cause significant rise in the water table or contribute to increased salinity in the local area.

The application area is mapped a Priority one (1) zone of the Gnangara Underground Water Pollution Control Area which is a Public Drinking Water Source Area and occurs within a Wellhead Protection Zone. The advice received from the internal water specialist at the department does not support the clearing and the proposed works within this location (DWER, 2023). This matter is further discussed under 'planning and other matters'.

The proposed clearing is at variance to this principle.

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

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

The proposed clearing is not considered likely to cause or exacerbate flooding and is not likely to be at variance to this Principle.

The application area does not occur on a slope and no runoff is likely to occur. The Bassendean drainage lines Phase mapped within the application area does have a high risk of flooding. However, only a small strip of vegetation in the centre of the application area is mapped within the Bassendean drainage line phase. It is not likely that clearing of this vegetation would result in flooding.

The proposed clearing is not likely to be at variance to this principle.

3.11 Relevant planning instruments and other matters

The application area is not zoned under the City of Wanneroo's (the City) District Planning Scheme No. 2 (DPS 2) and is zoned Parks and Recreation and State Forests under the Metropolitan Region Scheme. The City advised that the vegetation within the application area is mapped as a protected Natural Area under the City of Wanneroo's Local Biodiversity Plan 2018/18 – 2023/24 (City of Wanneroo, 2024).

There is currently a Development Application (DA) with DPLH for the construction of the public shooting range which is currently in the process of being assessed.

The application area falls within a Priority one (1) zone of the Gnangara Underground Water Pollution Control Area which is a Public Drinking Water Source Area and occurs within a Wellhead Protection Zone. According to the advice received from the department's Water Source Protection Planning branch, the proposed end land use is a non-conforming and an incompatible land use within the proposed area. It is considered that no management actions can be implemented to reduce the risk to the Priority one water reserve from the proposed works. The department also considers that the restrictions in wellhead protection zones are even greater than the Priority one area. Moving the proposal outside of the wellhead protection zones would not change the Department's advice above (DWER, 2024).

Further advice received from the department's Water Source Protection Planning branch (DWER, 2024), states that:

- Proposals for all recreation facilities in public drinking water source areas on crown land require assessment under *Operational Policy 13: Recreation within public drinking water source areas on crown land*.
- The proposal will need to demonstrate a number of aspects under the policy including that the facility cannot be located at an alternative site outside PDWSAs.
- For the area outside of the wellhead protection zone, the policy 13 consideration for the area being a lower risk groundwater source would apply. This consideration would not apply for the area within the wellhead protection zone.

The site where the application area is located is reserved Parks and Recreation and Water catchment under the Metropolitan Region Scheme. State Planning Policy 2.8 Bushland Policy for the Perth Metropolitan Region (SPP 2.8) outlines policy measures for the protection of regionally significant bushland on the Swan Coastal Plain portion of the Perth Metropolitan Region (DPLH, 2023). The proposed clearing is not in accordance with the State Planning Policy 2.8 Appendix 2(ix)(b) which recommend that activities within Bush Forever Sites should avoid unacceptable losses to TEC's and species listed under the EPBC Act. The DPLH has advised that proposals should provide evidence that all reasonable steps have been taken to avoid or minimise likely adverse impacts from and requires a review of the alternative locations that were considered (DPLH, 2023). Further advise from DPLH is that:

- In accordance with the state planning policy 2.0 Environmental and Natural Policy (section 5.5), decision making should consider protecting areas of high biodiversity, including land containing threatened flora and threatened ecological communities, or habitat for threatened fauna (DPLH, 2023).
- Clearing of bush forever should only be considered where a proposal can justify the overall purpose with regard to wider environmental, social and economic or recreational needs and all reasonable alternatives have been considered. Offset strategies required to offset any loss (DPLH, 2023).
- Alternative locations already void of vegetation or with limited native vegetation cover could be further investigated (DPLH, 2023).

No Aboriginal sites of significance have been mapped within the application area. 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. 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. This scale has been extracted from Keighery, B.J. (1994) Bushland Plant Survey: A Guide to Plant Community Survey for the Community. Wildflower Society of WA (Inc). Nedlands, Western Australia.

Measuring vegetation condition for the South West and Interzone Botanical Province (Keighery, 1994)

Condition	Description
Pristine	Pristine or nearly so, no obvious signs of disturbance.
Excellent	Vegetation structure intact, with disturbance affecting individual species; weeds are non-aggressive species.
Very good	Vegetation structure altered, with obvious signs of disturbance. For example, disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and/or grazing.
Good	Vegetation structure significantly altered by very obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it. For example, disturbance to vegetation structure caused by very frequent fires, the presence of some very aggressive weeds at high density, partial clearing, dieback and/or grazing.
Degraded	Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. For example, disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and/or grazing.
Completely degraded	The structure of the vegetation is no longer intact and the area is completely or almost completely without native species. These areas are often described as 'parkland cleared' with the flora comprising weed or crop species with isolated native trees or shrubs.

Appendix B. Biological survey exerts of the application area (Anders, 2023; Ecoscape, 2022; Coterra Environmental, 2023)

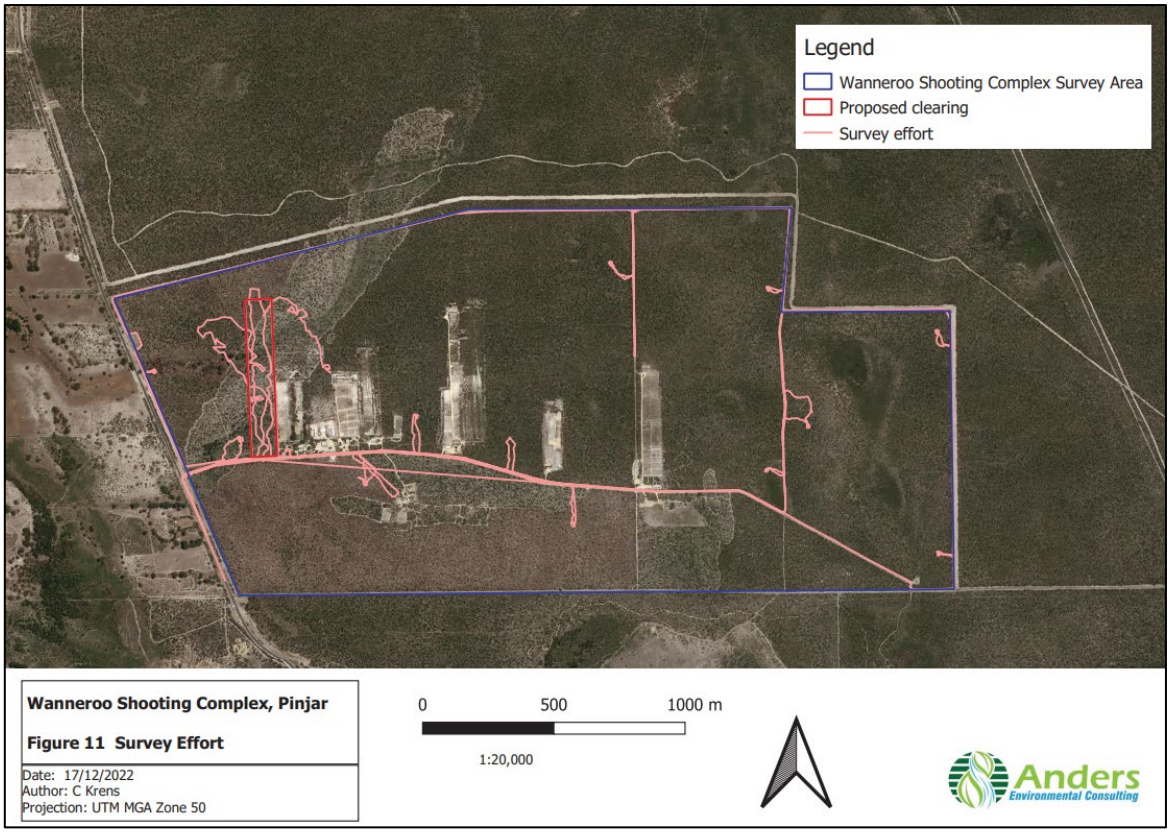

Figure 2: A map representing the survey efforts

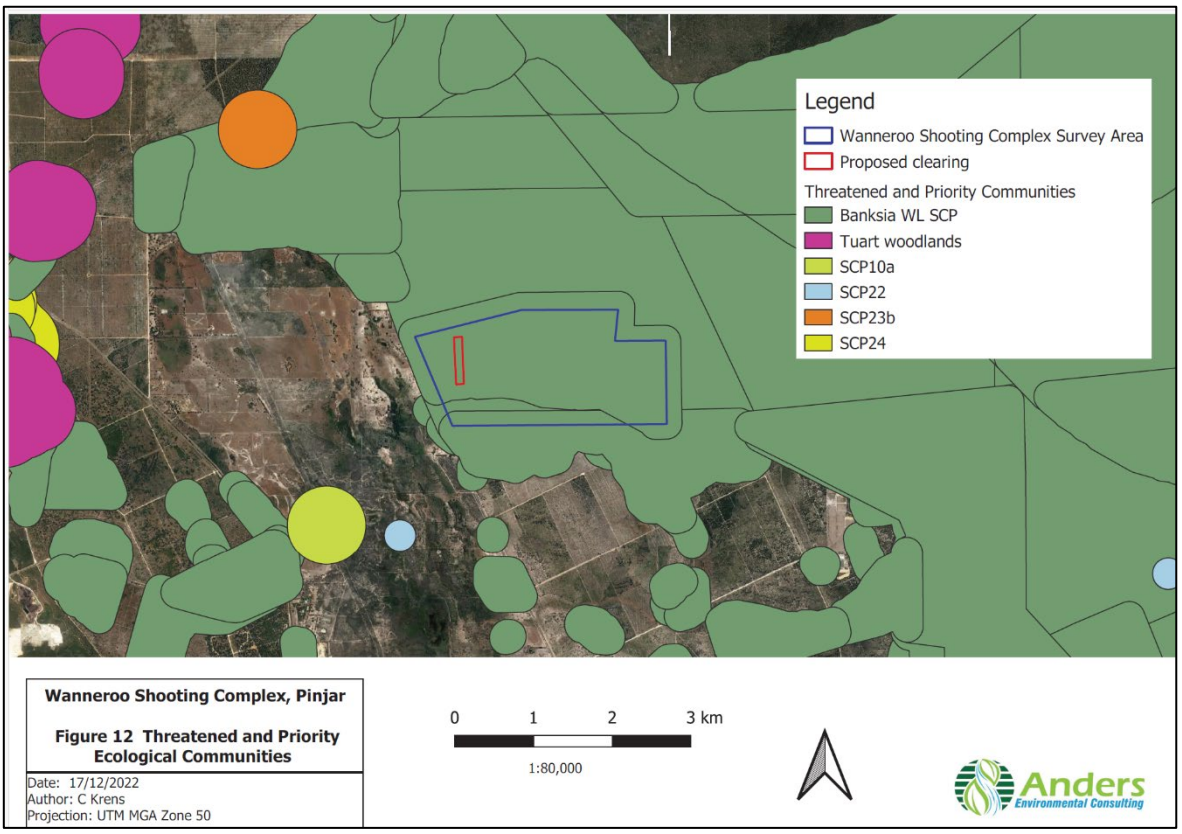

Figure 3: Vegetation condition across the survey area

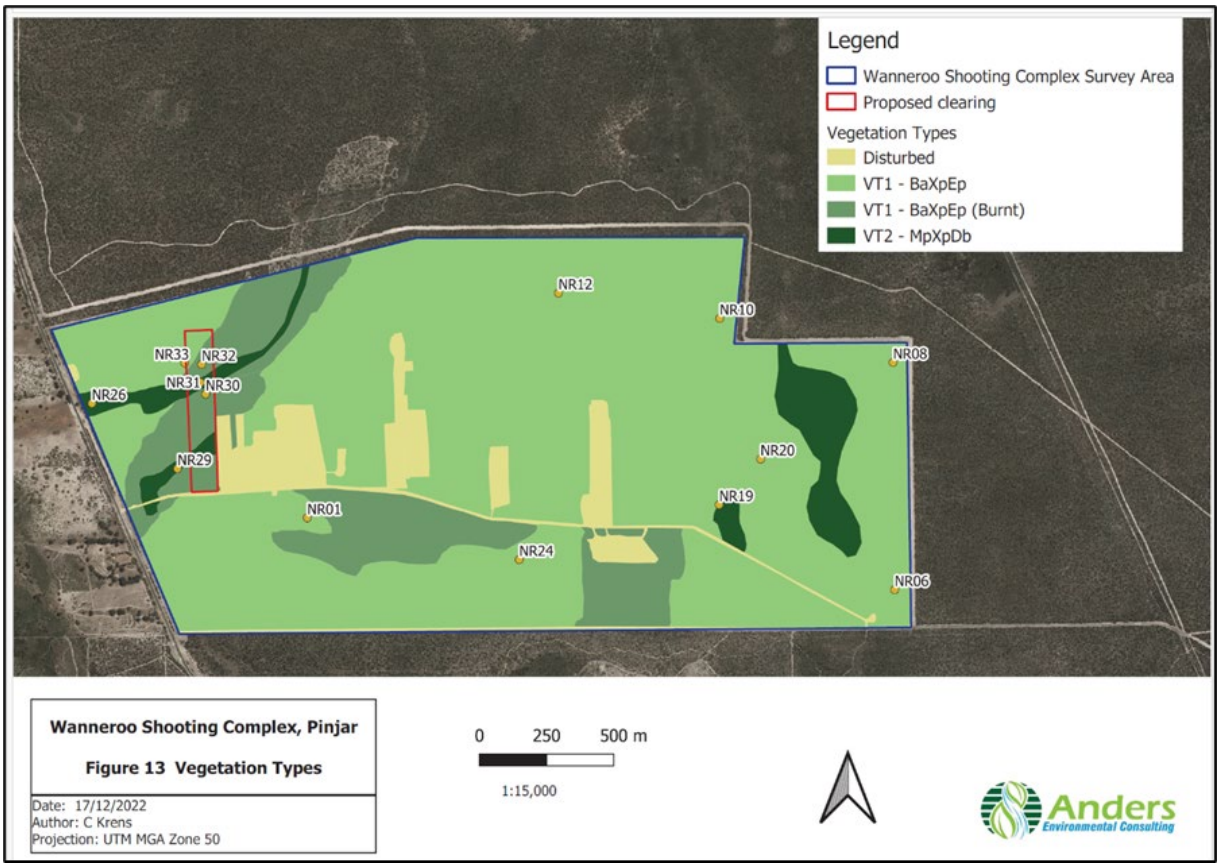

Figure 4: Vegetation type within the survey area.

Table 7: A detailed description of the vegetation recorded within the application area.

Code	Description	Details	Representative photograph
MpXpDb	*Melaleuca preissiana* open woodland over *Xanthorrhoea preissii* mid sparse shrubland over *Dasypogon bromeliifolius* low sparse forbland	Vegetation type: VT2 Located in discreet areas in the Eastern and Western sections of the survey area. Corresponds to mapped wetlands (see Figure 9) including Lake Pinjar (Multiple Use) which occurs within the clearing area. Species richness: 19 to 28 Sites: NR19, NR26, NR29	
BaXpEp	*Banksia attenuata- B. menziesii* open woodland over *Xanthorrhoea preissii* mid sparse shrubland over *Eremaea pauciflora* low sparse shrubland.	Vegetation type: VT1 Distributed throughout most of the survey area. Mapped during the reconnaissance survey as VT3. Species richness: 33 to 40 Sites: NR06, NR08, NR10, NR12, NR20, NR24 Area: 287.875 ha, 73%: 0.809 ha within clearing area, 287.066 ha outside clearing area	
BaXpEp – Burnt	*Banksia attenuata- B. menziesii* open woodland over *Xanthorrhoea preissii* mid sparse shrubland over *Eremaea pauciflora* low sparse shrubland.	Vegetation type: VT1 - burnt Occurring in large patches throughout the survey area and across the majority of the clearing area representing old burn scars estimated to be more than 5 years. Floristic composition was the same as the unburnt areas. Mapped during the reconnaissance survey as VT1. Species richness: 33 to 40 Sites: NR01, NR30, NR32, NR33 Area: 51.5 ha, 13%: 4.09 ha within clearing area, 47.4 ha outside clearing area	

Table 8: Condition of the vegetation within the clearing area and the survey area

Condition scale	Clearing area (ha)	Outside clearing area (ha)	Total survey area (ha)
Excellent	0	280.482	280.482
Very Good	4.78	62.637	67.417
Good	1.239	11.708	12.947
Completely Degraded	0	31.416	31.416
Total	**6.019**	**386.243**	**392.262**

Figure 5: Flora recorded from the survey area.

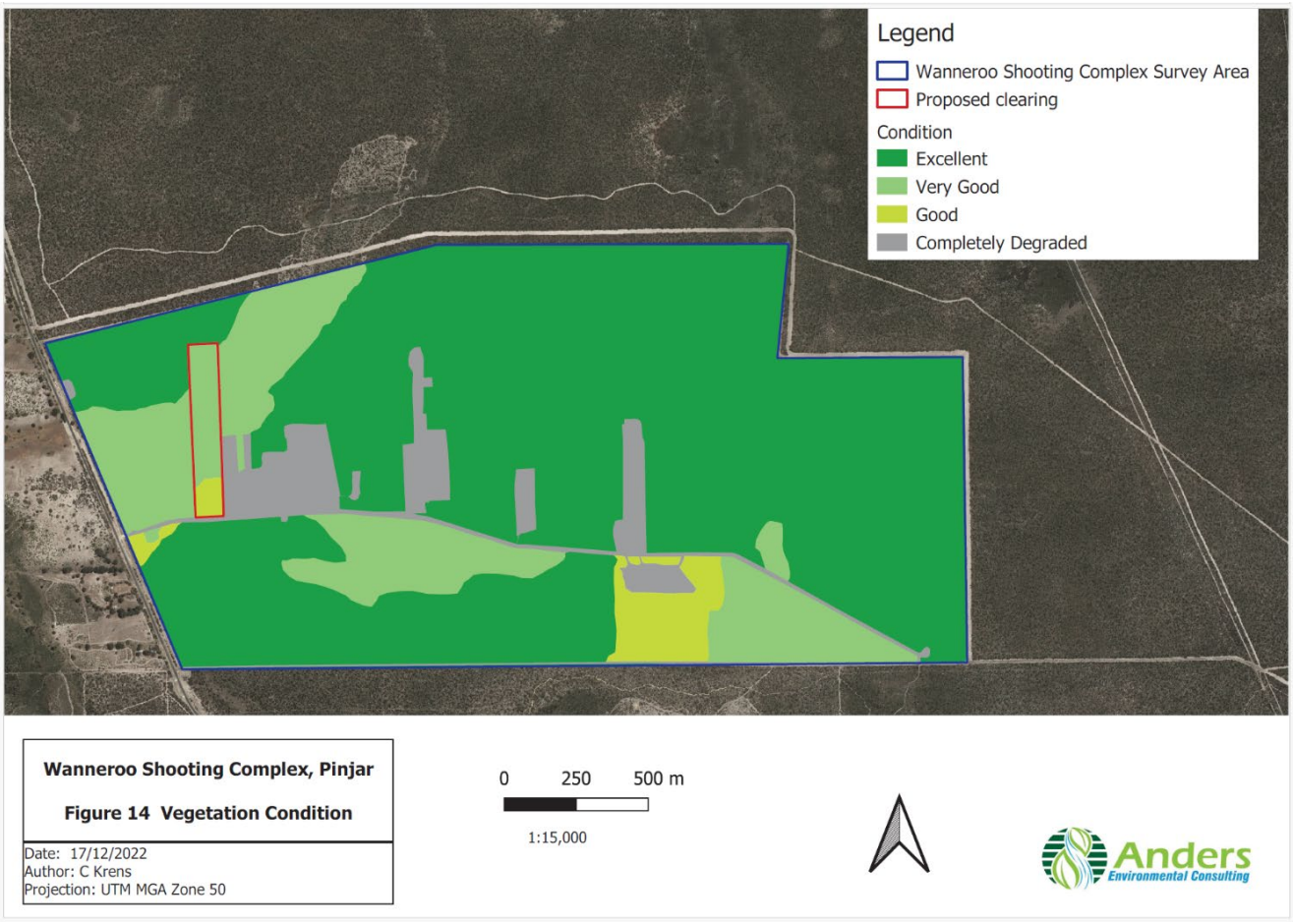

Figure 6: A map representing the vegetation condition within the survey area and the survey area/ clearing area.

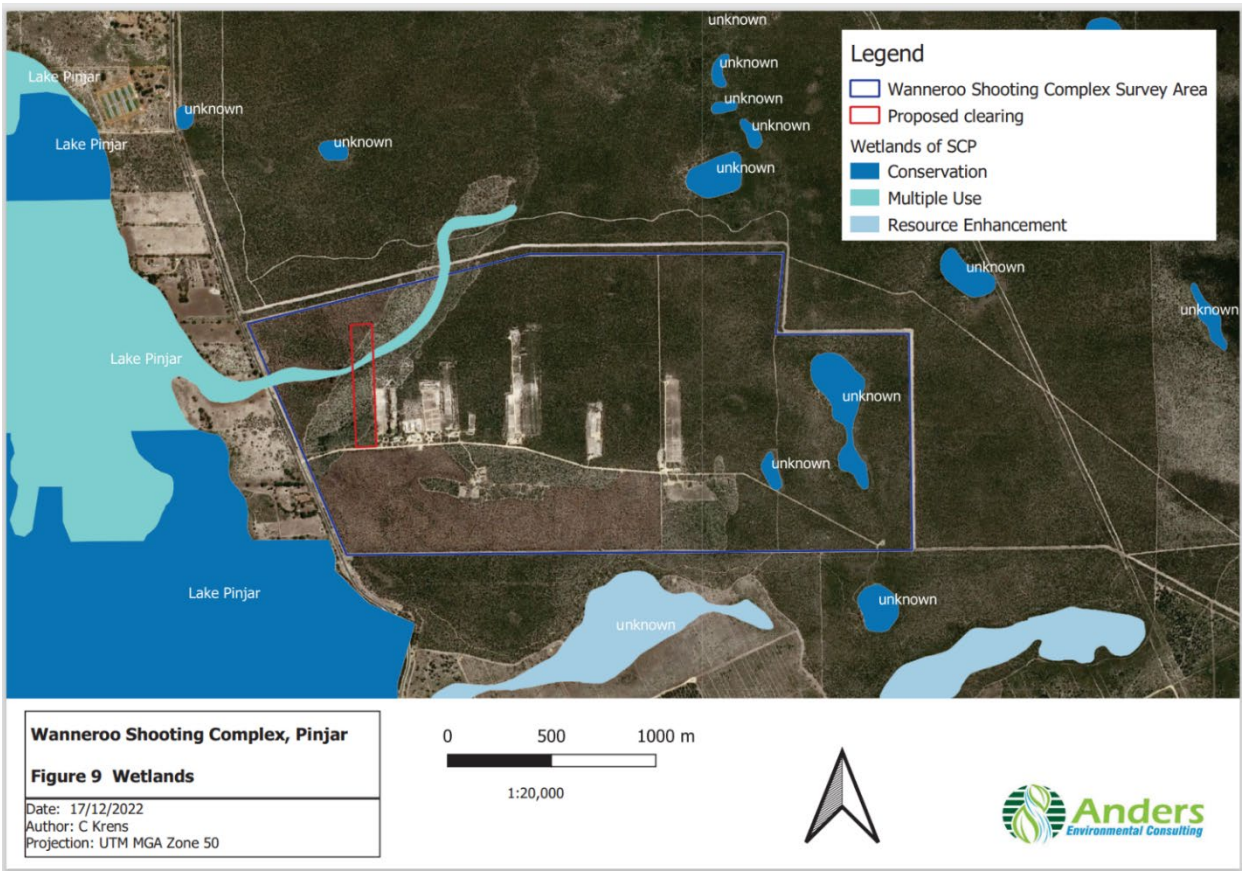

Figure 7: A map representing the wetlands of the Swan Coastal Plain.

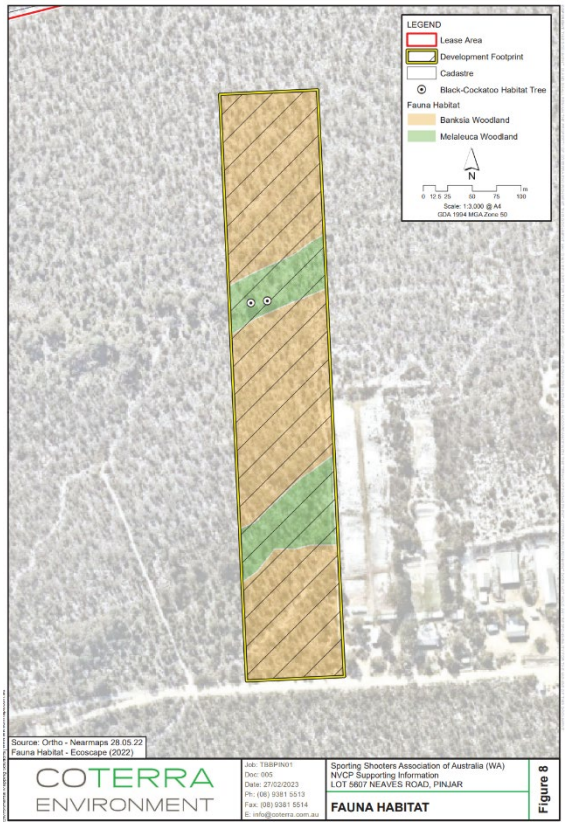

Figure 8: Mapped fauna habit within the clearing area.

Figure 9: Carnaby's black cockatoo habitat quality.

Figure 10: Forest-red tailed black cockatoo habitat quality.

Habitat type	Description	Photograph
***Banksia* Woodland**	**Description: Open *Banksia* woodland over shrubs and sedges on grey sandy soils** Habitat is suitable for a range of small mammals, reptiles and woodland birds. It is significant foraging habitat for the Carnaby's Cockatoos. **Extent**: 4.87 ha; 81.17%	
***Melaleuca* Woodland**	**Description: Open *Melaleuca* low woodland with scattered Marri trees over shrubs on grey sandy soils** Habitat is suitable for a range of small mammals, reptiles and woodland birds. It has significance as roosting and foraging habitat for Black-Cockatoos. **Extent**: 1.13 ha; 18.83%	

Figure 2: Fauna habitat recorded within the application area.

Image 1: Diggings

Image 2: Diggings

Figure 3: evidence of Quenda digging within the survey area.

Tree-M1

Tree-M2

Figure 4: Photographs of the black cockatoo habitat trees recorded within the application area.

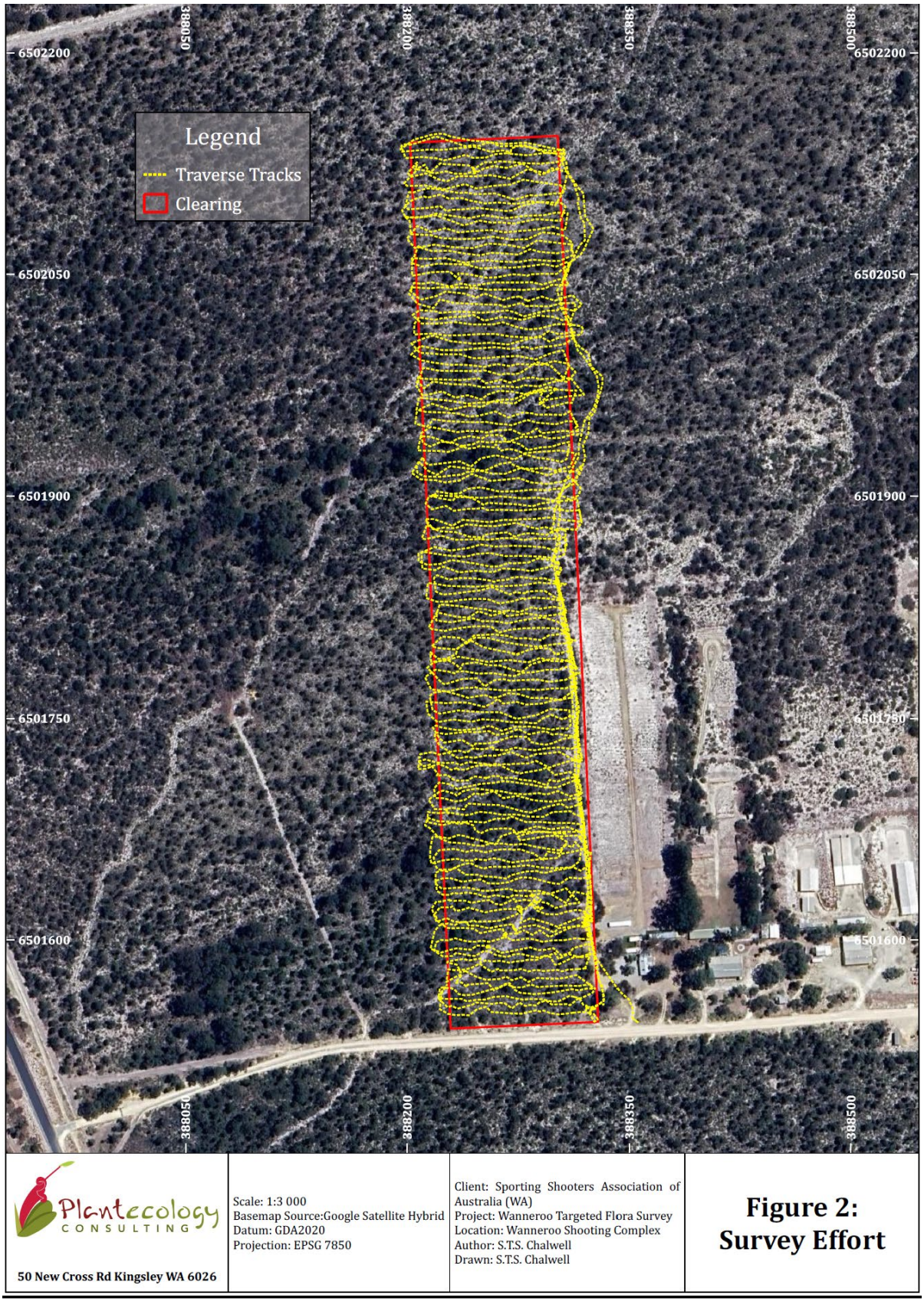

Figure 14: A map representing the survey effort to locate threatened flora species.

Appendix C. Sources of information

C.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
- Wheatbelt Wetlands Stage 1 (DBCA-021)

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

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