Government of Western Australia
Department of Water and Environmental Regulation

Clearing Permit Decision Report

1 Application details and outcome

1.1. Permit application details

Permit number:	CPS 9124/1
Permit type:	Purpose permit
Applicant name:	Shire of Esperance (the Shire)
Application received:	26 November 2020
Application area:	1.79 hectares (ha) of native vegetation
Purpose of clearing:	Constructing a dual-use pathway
Method of clearing:	Mechanical
Property:	Lot 20 on Deposited Plan 251103 Lot 881 on Deposited Plan 217292 Lot 9003 on Deposited Plan 69443
Location (LGA area/s):	Shire of Esperance
Localities (suburb/s):	Bandy Creek

1.2. Description of clearing activities

The application is to clear 1.79 ha of native vegetation in an approximately 1.92 ha clearing footprint for the purpose of constructing a dual-use path between the Castletown Quays development and Bandy Creek. The application area comprises of two linear strips of native vegetation along coastline separated by a patch of native vegetation (see Figure 1, Section 1.5). This patch was not included in the application, as at the time of the application, the Shire was still negotiating planning matters with the landowner.

1.3. Decision on application and key considerations

Decision:	Granted
Decision date:	8 April 2021
Decision area:	1.79 ha of native vegetation, as depicted in Section 1.5, below.

1.4. Reasons for decision

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

In making this decision, the Delegated Officer had regard for:

- the site characteristics (see Appendix A)
- the clearing principles set out in Schedule 5 of the EP Act (see Appendix B)
- relevant datasets available at the time of the assessment (see Appendix EE.1)
- supporting documents supplied by the Shire (2020a)
- Vegetation, Flora, Fauna and Environmental Considerations, and Targeted Flora Report (referred to as the Flora survey herein this report) (2020b)
- relevant planning instruments and any other matters considered relevant to the assessment (see Section 3).

Considering the above, the Delegated Officer determined that conservation significant fauna may be utilising the application area at the time of clearing. Slow, directional clearing that enables fauna to move into adjacent habitat will mitigate impacts to individuals that may be present at the time of clearing.

The application area is adjacent to native vegetation that contains suitable habitat for fauna. Weed and dieback management practices will assist in mitigating impacts to adjacent vegetation.

The Delegated Officer considered that the impacts of the proposed clearing are unlikely to have any long-term adverse impacts on the environmental values in the local area and that fauna management and weed and dieback management practices will mitigate any potential impacts.

1.1. Site map

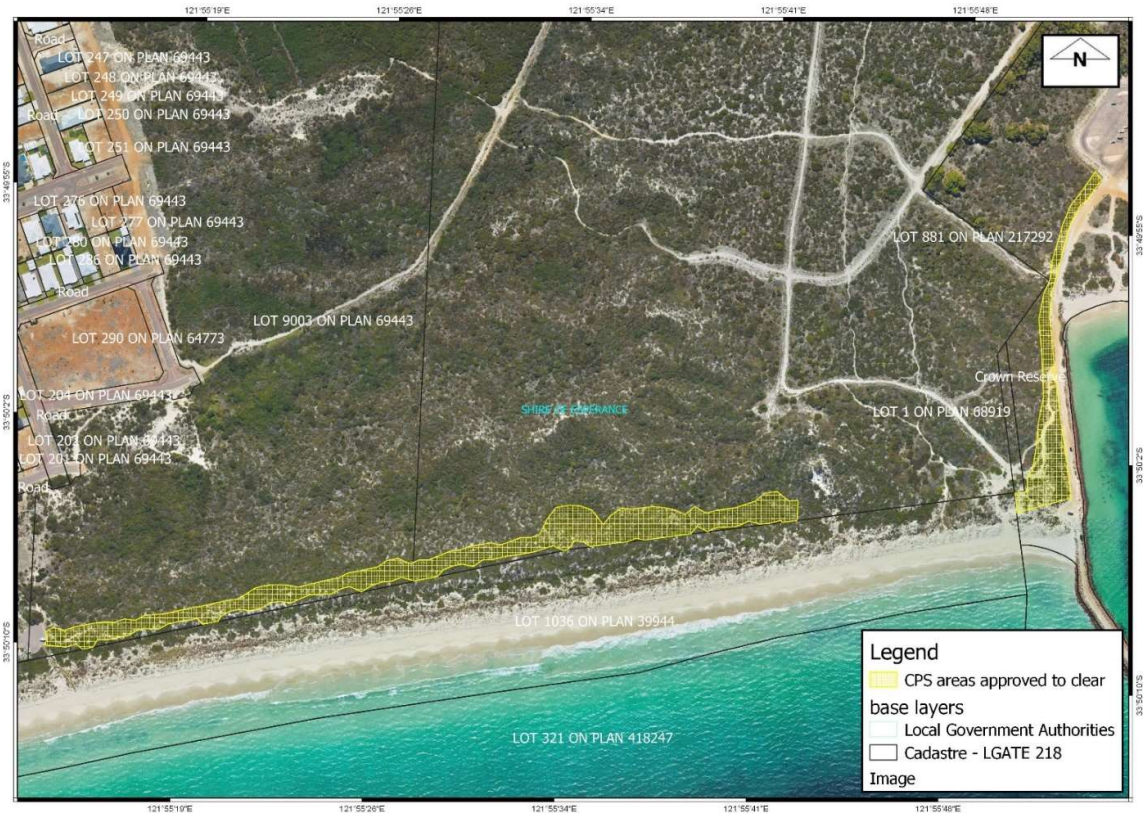

Figure 1 - Map of the application area. The areas cross-hatched yellow indicate the areas authorised to be cleared under the granted clearing permit.

2 Legislative context

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

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

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

Other legislation of relevance for this assessment include:

- *Biodiversity Conservation Act 2016* (WA) (BC Act)
- *Planning and Development Act 2005* (WA) (P&D Act).

The key guidance documents which inform this assessment are:

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

3 Detailed assessment of application

3.1. Avoidance and mitigation measures

In relation to whether alternatives that would avoid or minimise the need for clearing were considered, the Shire (2020a) advised that:

- the only practical alternative was to place the footpath directly on the beach. This was not deemed feasible as the path could get washed away;
- other options away from the beach were not possible due to encroachment of the upcoming Flinders Stage 3 development and restrictions with other private property;
  clearing was minimised by aligning some of the pathway in existing cleared footprints, such as underneath powerlines;
- where possible, the path was placed on the road shoulders.

The Delegated Officer was satisfied that the Shire made all reasonable efforts to avoid and minimise potential impacts of the proposed clearing on environmental values.

3.2. Assessment of impacts on environmental values

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

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

3.2.1. Environmental value: biological values (priority flora) – Clearing Principle (a)

Assessment:

Based on the similarities between the soil and vegetation types within the application area and those present in habitats for flora taxa recorded in the local area, the following conservation significant flora species were considered to potentially occur within the application area:

- *Banksia prolata* subsp. *calcicola*
- *Goodenia quadrilocularis*
- *Eucalyptus litorea*
- *Eucalyptus preissiana* subsp*. lobata*
- *Myosotis australis*.

Banksia prolata subsp. *calcicola* (Priority 4) is known to occupy white sand over limestone in coastal areas and flowers from July to September (Western Australian Herbarium, 1998-). Noting that the survey was undertaken during the flowering period of this species and it did not identify any individuals of *B. prolata* subsp. *calcicola,* the proposed clearing is not likely to have impacts on this flora taxon.

Goodenia quadrilocularis (Priority 2) occupies sand dunes, granite slope and outcrops, and flowers between September and December (Western Australia Herbarium, 1998-). The timing of the survey was not optimal for this taxon, but given *G. quadrilocularis* is a woody perennial herb, easily detectable and identifiable at any time of year, it would have been identified during the Flora survey had it been present within the application area. Therefore, the proposed clearing is not likely to have impacts on this species.

Eucalyptus litorea (Priority 2) occurs on calcareous sand, sandy clay loam and stones. This species is commonly associated with leeward of primary dunes around salt lakes (Western Australia Herbarium, 1998-). *E. litorea* is a species of mallee that has hard, rough grey bark on the trunk, smooth grey bark above, lance-shaped adult leaves, flower buds in groups of seven, white flowers and cylindrical or barrel-shaped fruit (iNaturalist, 2021). The Flora survey (Shire of Esperance, 2020b) did not identify any *E.* species within the application area. Noting the characteristics of *E. litorea*, if would have been identifiable during the Flora survey had it been present within the application area. Therefore, the proposed clearing is not likely to have impacts on this species.

Eucalyptus preissiana subsp*. lobata* (Priority 4) tends to occupy sandy soils on coastal limestone rises and sand dunes. This species flowers in November (Western Australia Herbarium, 1998-). Although the Flora survey (Shire of Esperance, 2020b) was not conducted during the flowering time of this species, given it is a species of mallee approximately 2.5 metres high (Western Australian Herbarium, 1998-) and is detectable at any time of year, it would

have been identified during the Flora survey (Shire of Esperance, 2020b) had it been present within the application area. Taking this into account, the proposed clearing is not likely to have impacts on this species.

Myosotis australis (Priority 4) tends to inhabit grey sand over limestone and flowers from August to November (Western Australian Herbarium, 1998-). This species is known from seven records, a majority of which occurs on islands such as Rottnest Island, Garden Island or Bald Island. A single occurrence of this species has been recorded within the local area; on Woody Island approximately 16 km from the application area. Taking into consideration the known distribution of *M. australis* and the location of the application area, the proposed clearing is not likely to impact the conservation status of this taxon.

The Flora survey summary is available in Appendix D.

Outcome:

Based on the above assessment, the Delegated Officer has determined that the proposed clearing is considered acceptable in relation to this environmental value.

Conditions:

No management conditions required.

3.2.2. Environmental value: biological values (fauna) – Clearing Principle (b)

Assessment:

Noting the habitat requirements, distribution of the recorded species, the mapped vegetation type and the condition of the vegetation within the application area, the application area may provide suitable habitat for the following conservation significant fauna species:

- *Falco peregrinus* (peregrine falcon)
- *Isoodon fusciventer* (quenda, southwestern brown bandicoot)
- *Acanthophis antarcticus* (southern death adder).

Peregrine falcon

Peregrine falcon is found in most habitats, from rainforests to the arid zone and at most altitudes, from the coast to alpine areas. It requires abundant prey and secure nest sites and prefers coastal and inland cliffs or open woodlands near water and may even be found nesting on high city buildings (Australian Museum, 2020). This species is widespread, highly mobile and is found in various habitats.

Quenda

Quenda is known to inhabit scrubby, swampy vegetation with low, dense understorey, located nearby watercourses, pasture, or forest/woodland that is regularly burnt and is in areas of pasture and cropland lying close to dense cover. (Department of Environment and Conservation, 2012a).

Southern death adder

This species is known to occur on areas of deep sands in forests and woodlands, grassland and heath (Wilson & Swan, 2017; Australian Reptiles Online Database (AROD), 2014). Noting the vegetation identified by the Shire during the Flora survey (2020b), the application area may provide suitable habitat for the Southern death adder.

Significant habitat refers to the resources (breeding, resting and feeding), connectivity or habitat area for a species that is critical for its survival (Department of the Environment (now the Department of Agriculture, Water and the Environment), 2013). Noting the extent of the application area and its location within a broader remnant containing vegetation of similar composition and condition as that proposed to be cleared, as well as the extent of remnant vegetation in the local area, the application area is unlikely to be significant for the survival of the above fauna species, or be necessary for the maintenance of their significant habitat.

The application area is adjacent to native vegetation that also comprises suitable habitat for fauna. Given this, the proposed clearing increases the risk of weed and dieback spreading into this vegetation.

Ecological linkage

According to available databases, the application area is mapped approximately 1.2 km south of a mapped South West Regional Ecological Linkage. Given the separation distance and the extent of vegetation in the application area, the proposed clearing is not likely to have an impact on the environmental value of this linkage.

Aerial imagery and spatial datasets indicate that a larger patch of remnant vegetation occurs immediately north of the application area. This patch is more likely to be used by fauna for movement across the landscape. Therefore, the proposed clearing is not likely to have an impact on vegetation acting as a key stepping stone for fauna movement.

Outcome:

Based on the findings of the assessment, the Delegated Officer determined that whilst not considered significant habitat for peregrine falcon, quenda and southern death adder, impacts to individuals of these species may occur at the time of clearing.

Conditions:

To minimise the potential impacts, the Shire will be required to undertake slow, progressive one directional clearing to allow terrestrial fauna to disperse ahead of the clearing activity should they occur on site at the time of clearing (as conditioned on the clearing permit).

Weed and dieback management practices will assist in mitigating impacts to adjacent vegetation.

3.3. Relevant planning instruments and other matters

Project background

A shared path was proposed to be constructed to connect the suburb of Castletown to the Bandy Creek Harbour. The Bandy Creek Harbour area is a strategic destination in relation to recreational activity. The proposal will connect the public boat ramp, commercial and recreational marina facilities, Department of Transport (DoT) offices, angling club rooms, recreational park with picnic BBQ and toilet facilities, recreational fishing, swimming, fish shop and Lucky Bay Brewery. Additionally, it will provide an amenity and additional trail within the area. The shared path was highlighted in the Regional 2050 Esperance Cycling Strategy as a high priority. Currently, there is no pathway and the proposed alignment traverses a future residential subdivision area between developed areas. After the proposed residential estate has been developed, it will be a key pathway for the new suburb (the Shire, 2020b).

The Shire has received funds from DoT to construct the asphalt component of the shared path (the Shire, 2020b).

Aboriginal sites of significance

Bandy (Barndi) Creek, Old Pad (Bandy Creek) and Old Camp (Bandy Creek) Aboriginal sites of significance have been mapped within the vicinity of 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.

Appendix A. Site characteristics

Characteristic	Details
Local context	The application area is mapped within the Esperance Plains IBRA bioregion and is part of a larger, approximately 95 ha in size, area of native vegetation. This area is surrounded by a residential development and the coastline. Spatial data indicate the local area (20 km radius of the application area) retains approximately 39.4 per cent (84,000 ha) of the original native vegetation cover.
Ecological linkage	The application area is not within mapped ecological linkages. The closest mapped ecological linkage is South Coast Linkage (axis ID 34) approximately 1.2 km north of the application area.
Conservation areas	Approximately 11.4 per cent of the local area (approximately 9,500 ha) occurs within DBCA managed estate. The application area is not part of any conservation area. The closest conservation area is Woody Lake Nature Reserve (Class A) located approximately 1.9 km north of the application area.
Vegetation description	The Flora survey conducted by the Shire (2020b) indicates the vegetation within the application area consists of immediate coastal fore-dune shrubland, with swales dominated by *Lepidosperma gladiatum* and *Tetragonia implexicoma*, the slopes by *Acacia cochlearis* and *Rhaggodia baccata*, and the ridges dominated by *Spyridium globulosum*. Representative photos are available in Appendix D. This is consistent with the Beard vegetation association 42 mapped in the application area which is described as shrublands; mallee & acacia scrub on south coastal dunes (Shepherd et al, 2001) The mapped vegetation type retains approximately 95 per cent of the original extent (Government of Western Australia, 2019). Representative photos and the Flora survey summary (Shire of Esperance, 2020b) are available in Appendix D.
Vegetation condition	The Flora survey (the Shire, 2020b) indicate the vegetation within the proposed clearing area ranges from very good (Keighery, 1994) to completely degraded (Keighery, 1994) condition. The full Keighery (1994) condition rating scale is provided in Appendix C Representative photos and the Flora survey summary (Shire of Esperance, 2020b) are available in Appendix D.
Climate and landform	*Rainfall:* 700 millimetres *Evapotranspiration:* 400 millimetres *Groundwater Salinity (Total Dissolved Solids):* 500-1000 milligrams per litre total dissolved solids
Soil description	The soil subsystem within the application area is mapped as Tooregullup 5 Subsystem (Department of Primary Industries and Regional Development, 2021) described as level plain with moderately inclined dune ridges and associated swales with occasional swamps Calcareous deep sands associated pale deep sands and minor calcareous shallow sands (Northcote et al., 1968).
Land degradation risk	The soils subsystem mapped in the application area has a high risk of water repellency, water storage and microbial purification and elevated risk of sub surface compact. Risks of salinity, flood, waterlogging, instability, water and wind erosion are very low.

Characteristic	Details
Waterbodies	No wetlands are mapped within the application area. The closest wetland is the Ramsar category wetland, Lake Warden System mapped approximately 2 km north of the application area. No watercourses intersect the application area. The closest watercourses from the application area is Bandy Creek mapped approximately 460 m northeast of the application area.
Hydrogeography	The application area is mapped within a proclaimed Esperance Groundwater Area and is not mapped within any proclaimed Surface Water Area.
Flora	According to available databases, 40 Priority listed flora species have been recorded within the local area. No flora species listed as threatened under the BC Act have been recorded in the local area. Based on the similarities shared between the soil and vegetation types within the application area and the habitats within which these flora taxa have been identified, some flora species may occur within the application area.
Ecological communities	Two federally listed TECs, which area also state listed Priority 3 ecological communities, have been mapped within the local area: • Proteaceae dominated kwongkan shrublands of the southeast coastal floristic province of Western Australia • Subtropical and Temperate Coastal Saltmarsh.
Fauna	According to available databases, 55 conservation significant fauna species have been recorded within the local area (DBCA, 2007). Given the boundary of the local area overlaps the ocean, the majority of the recorded species are exclusively associated with marine, estuarine or freshwater habitats that do not occur within the application area.

Vegetation extent

	Pre-European extent (ha)	Current extent (ha)	Extent remaining (%)	Current extent in all DBCA managed land (ha)	Current proportion (%) of pre-European extent in all DBCA managed land
IBRA bioregion*					
Esperance Plains	2,899,940.66	1,494,450.87	51.53	55.05	28.37
Vegetation complex					
Beard vegetation association 42 *	135,419.99	128,052.58	94.56	56.82	53.73
Local area (calculation - delete if not required)					
20km radius	33,006.73	83,818.7	39.38	9,513.68	11.35

*Government of Western Australia (2019)

Flora analysis table

With consideration for the site characteristics set out above, relevant datasets (see Appendix E.1), and biological survey information (the Shire, 2020b), impacts to the following conservation significant flora required further consideration.

Species name	Conservation status	Suitable habitat features ?	Suitable vegetation type?	Suitable soil type?	Distance of closest record to application area (m)	Are surveys adequate to identify?
Banksia prolata subsp. *calcicola*	4	Yes	Yes	Yes	3,898	Yes
Eucalyptus litorea	2	Yes	Yes	Yes	15,406	Yes
Eucalyptus preissiana subsp. *lobata*	4	Yes	Yes	Yes	17,483	Yes
Goodenia quadrilocularis	2	Yes	Yes	Yes	15,919	Yes
Myosotis australis	4	Yes	Yes	Yes	16,336	Yes

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

Fauna analysis table

Species name	Conservation status	Suitable habitat features?	Distance of closest record to application area (mm)	Are surveys adequate to identify?
Peregrine falcon	OS	Yes	2,426	No
Quenda, southwestern brown bandicoot	P4	Yes	7,324	No
Southern death adder	P3	Yes	4,840	No

CR: critically endangered, EN: endangered, VU: vulnerable, EX: Presumed extinct species, IA (M) Migratory birds protected under an international agreement, CD: Conservation dependent fauna, OS: Other specially protected fauna

Land degradation risk table

C	C1	C2	C3	C4
pH				
0-10 acidity	very strongly acid: 0 %	strongly acid: 0 %		
0-10 alkalinity	strongly alkaline: 0 %	alkaline: 79 %		
50-80 acidity	very strongly acid: 0 %	strongly acid: 0 %		
50-80 alkalinity	strongly alkaline: 8 %	alkaline: 71 %		
acidification risk	presently acid: 21 %	high: 0 %	moderate: 0 %	low: 79 %
SALINITY				
salinity risk	presently saline: 0 %	high: 0 %	moderate: 0 %	nil or partial: 100 %
surface salinity	extreme: 0 %	high: 0 %	moderate: 0 %	slight to nil: 100 %
SOME PLANT LIMITS				
rooting depth	very shallow: 0 %	shallow: 8 %	moderately shallow: 0 %	v deep to moderate: 92 %
sub surface compact	high: 0 %	moderate: 100 %	low: 0 %	
water repel	high: 91 %	moderate: 8 %	low: 0 %	nil: 1 %
water storage	extremely low: 78 %	very low: 1 %	low: 20 %	high to moderate: 1 %
EROSION				
flood risk	high: 0 %	moderate: 0 %	low: 0 %	low: 100 %
instability	high: 0 %	moderate: 0 %	low: 1 %	nil to very low: 99 %
water erosion	extreme; 1 %	very high: 5 %	high: 5 %	nil to moderate: 89 %
wind erosion	extreme; 0 %	very high: 0 %	high: 20 %	nil to moderate: 80 %
WATER & DRAINAGE				
site drainage	very poor: 0 %	poor: 1 %	moderate: 0 %	high: 99 %
waterlogging	very high: 0 %	high: 0 %	moderate: 0 %	nil to low: 99 %
OTHER QUALITIES				
excavation ease	very low: 6 %	low: 8 %	moderate: 7 %	high: 79 %
microbial purification	very low: 72 %	low: 8 %	moderate: 20 %	high: 0 %

C	C1	C2	C3	C4
phosphorus loss	extreme: 1 %	very high: 6 %	high: 5 %	nil to moderate: 88 %

*Note: (column 1 most limiting, 4 least)

Appendix B. Assessment against the clearing principles

Assessment against the clearing principles	Variance level	Is further consideration required?
Environmental value: biological values		
Principle (a): *"Native vegetation should not be cleared if it comprises a high level of biodiversity."* Assessment: The vegetation proposed to be cleared is not considered to be part of an ecological linkage and does not provide suitable habitat for threatened or priority ecological communities, assemblages of plants or significant habitat for conservation significant fauna. Based on the results of the Flora survey (Shire of Esperance, 2020b), conservation significant flora species are considered to have a low likelihood of presence within the application area.	Not likely to be at variance	Yes Refer to Section 3.2.1, above
Principle (b): *"Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna."* Assessment: The area proposed to be cleared does not contain foraging, roosting or breeding habitat for Carnaby's cockatoo or significant habitat for conservation significant fauna. Peregrine falcon and ground dwelling conservation significant fauna may utilise the application area.	May be at variance	Yes Refer to Section 3.2.2, above.
Principle (c): *"Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora."* Assessment: Noting the findings of the Flora survey (the Shire, 2020b), the application area is unlikely to contain habitat for threatened flora species listed under the BC Act.	Not likely to be at variance	No
Principle (d): *"Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a threatened ecological community."* Assessment: The application area does not contain species that can indicate the occurrence of a threatened ecological community listed under the BC Act.	Not likely to be at variance	No
Environmental value: significant remnant vegetation and conservation areas		
Principle (e): *"Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared."* Assessment: The extents of the mapped vegetation type and native vegetation in the local area are consistent with the national objectives and targets for biodiversity conservation in Australia.	Not likely to be at variance	No
Principle (h): *"Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area."* Assessment: Given the separation distance between the application area and conservation areas, the proposed clearing is not likely to have an impact on the environmental values of nearby conservation areas.	Not likely to be at variance	No
Environmental value: land and water resources		

Assessment against the clearing principles	Variance level	Is further consideration required?
Principle (f): *"Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland."* Assessment: Given no watercourses or wetlands are recorded within the application area, the proposed clearing is unlikely to impact on- or off-site hydrology and water quality.	Not likely to be at variance	No
Principle (g): *"Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation."* Assessment: The mapped soils are not susceptible to wind, water erosion, nutrient export or salinity. Noting the extent of the application area, the proposed clearing is not likely to have an appreciable impact on land degradation.	Not likely to be at variance	No
Principle (i): *"Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water."* Assessment: Given no watercourses or wetlands are recorded within the application area, the proposed clearing is unlikely to impact surface or ground water quality.	Not likely to be at variance	No
Principle (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."* Assessment: The mapped soils and topographic contours in the surrounding area do not indicate the proposed clearing is likely to contribute to increased incidence or intensity of flooding. Given no watercourses or wetlands are recorded within the application area, the proposed clearing is unlikely to contribute to waterlogging.	Not likely to be at variance	No

Appendix C. Vegetation condition rating scale

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

Considering its location, the scale below was used to measure the condition of the vegetation proposed to be cleared. 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 D. Photographs of the vegetation, Survey summary

Figure 1 - Representative photograph of the vegetation in the application area (Shire of Esperance, 2020b)

Figure 1 - Vegetation in the application area in degraded condition (Shire of Esperance, 2020b)

The Flora survey summary

The Flora survey was conducted in accordance with the Environmental Protection Authority's *Technical Guidance, Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia (2016)*.

The field work was undertaken on 15 July 2020. Whilst it was mid-winter, many plants were beginning to flower and many annual herb species were present with the wetter soil conditions. It was therefore considered that the timing of the survey was suitable to determine the presence or absence of any priority or threatened flora. Vegetation was thoroughly searched throughout the application area. Suitable habitat for threatened and priority flora determined in the desktop study were particularly focused on and extensively searched.

Due to the high diversity and complexity of Esperance's flora, all species were recorded to compile an incidental species list. All species unknown in the field were collected and identified ex situ, using keys, Western Australian

Herbarium's Florabase (DBCA 2020e), manuals and Esperance District Herbarium, to ensure no threatened and priority flora were missed.

Results

The Flora survey identify the following:

- using the Keighery (1994) vegetation condition scale, the vegetation within the application area appeared to be in:
    - very good (approximately 68 per cent)
    - good (approximately 9.6 per cent)
    - degraded (approximately 18.2 per cent)
    - completely degraded condition (approximately 3.4 per cent)
- a single vegetation community was identified within the application area: common immediate coastal fore-dune shrubland, with swales dominated by *Lepidosperma gladiatum* and *Tetragonia implexicoma,* the slopes by *Acacia cochlearis* and *Rhaggodia baccata,* and the ridges dominated by *Spyridium globulosum*
- the vegetation in the application area is mostly not susceptible to *Phytophthora cinnamomi* and would likely be classified as uninterpretable
- the vegetation in the application area did not meet key diagnostic criteria of any PEC or TEC mapped in the local area
- no threatened or priority flora were identified within the application area.

Appendix E. Sources of information

E.1. GIS databases

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

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