



Clearing Permit Decision Report

1. Application details and outcomes

1.1. Permit application details

Permit number:	9896/1
Permit type:	Purpose Permit
Applicant name:	Santos WA Southwest Pty Ltd
Application received:	29 September
Application area:	3.9427 hectares
Purpose of clearing:	Remediation, Rehabilitation and Associated Activities
Method of clearing:	Mechanical Removal, hand clearing and vehicular disturbance
Tenure:	Petroleum Production Licence TL/2
Location (LGA area/s):	Shire of Ashburton
Colloquial name:	Airlie Island Decommissioning Project

1.2. Description of clearing activities

Santos WA Southwest proposes to clear up to 3.9427 hectares of native vegetation within a boundary of 3.9427 hectares, for the purpose of remediation and rehabilitation works. The project is located on the 'C' class nature reserve, Airlie Island (Crown Reserve 40323), approximately 35 kilometres north-east of Onslow, within the Shire of Ashburton.

The application is to allow for access routes for mobile equipment (light vehicles, small drill rig and/or excavator) to undertake soil and groundwater monitoring, and investigation works (Santos, 2022). These works may followed by remediation and rehabilitation works before the area being relinquished back to the Department of Biodiversity, Conservation and Attractions (DBCA) (Santos, 2022).

1.3. Decision on application and key considerations

Decision:	Grant
Decision date:	3 November 2022
Decision area:	3.9427 hectares of native vegetation

1.4. Reasons for decision

This clearing permit application was made in accordance with section 51E of the *Environmental Protection Act 1986* (EP Act) and was received by the Department of Mines, Industry Regulation and Safety (DMIRS) on 29 September 2022. DMIRS advertised the application for a public comment for a period of 21 days, and no submissions were received.

In making this decision, the Delegated Officer had regard for the site characteristics (Appendix B), relevant datasets (Appendix E), supporting information provided by the applicant (Appendix A) including the results of a flora, vegetation and fauna monitoring, the clearing principles set out in Schedule 5 of the EP Act (Appendix D), proposed avoidance and minimisation measures (Section **Error! Reference source not found.**), relevant planning instruments and any other matters considered relevant to the assessment (Section 3.3).

The assessment identified that the proposed clearing may result in:

- the potential introduction and spread of weeds into adjacent vegetation, which could impact on the quality of the adjacent vegetation and its habitat values; and
- the loss of native vegetation that is suitable habitat for conservation significant seabirds, turtles and one reptile species.

After consideration of the available information, as well as the applicant's minimisation and mitigation measures (see Section 3.1), the Delegated Officer determined the proposed clearing is unlikely to lead to appreciable land degradation.

The Delegated Officer decided to grant a clearing permit subject to conditions to:

- avoid, minimise to reduce the impacts and extent of clearing;
- take hygiene steps to minimise the risk of the introduction and spread of weeds; and
- reduce the impact on nesting species by restricting clearing between October and April each year.

1.5. Site map

A site map of proposed clearing is provided in Figure 1 below.



Figure 1. Map of the application area. The yellow area indicates the area within which conditional authorised clearing can occur 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)
- *Conservation and Land Management Act 1984* (WA) (CALM Act)

- *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act)
- *The Petroleum and Geothermal Energy Resources Act 1967* (WA)
- *The Petroleum Pipelines Act 1969* (WA)

The key guidance documents which inform this assessment are:

- *A guide to the assessment of applications to clear native vegetation* (DER, December 2013)
- *Procedure: Native vegetation clearing permits* (DWER, October 2019)

3. Detailed assessment of application

3.1. Avoidance and mitigation measures

Evidence was submitted by the applicant, demonstrating that avoidance and mitigation measures such as those listed below will be undertaken:

- investigative activities will be undertaken and executed in alignment with the current in-force DMIRS approved Varanus Island Hub Operations Environmental Plan (State Waters);
- activities will be undertaken outside of the turtle and migratory bird nesting seasons (October – April);
- personnel accommodated on vessels offshore;
- activity footprint restricted to within the Airlie Island Lease boundary and previously disturbed areas will be prioritised where possible;
- as per routine practice the Santos Quarantine Management Plan and associated controls will be implemented for Airlie Island mobilisations;
- Santos activity risk assessment and hazard control procedures to be implemented for all aspects of the scope; and
- annual environmental monitoring campaigns (marine turtle, seabird and vegetation etc.) will continue on Airlie Island after the investigatory works program has been completed.

The Delegated Officer was satisfied that the applicant has made a reasonable effort 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 B) and the extent to which the impacts of the proposed clearing present a risk to biological, conservation, or land and water resource values.

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

3.2.1. Biological values (fauna) - Clearing Principles (b)

Assessment

In 1991, a lease was granted under the *Conservation and Land Management Act 1984* over a portion of the reserve for the purpose of constructing, operating, inspecting, maintaining and repairing the pipeline specified in Pipeline License 14 (R1) (Lease 1901/100) (Santos, 2022). Santos WA are required to have an Environmental Management Plan in place and conduct annual turtle monitoring, flora, vegetation and weed monitoring and seabird monitoring as per the lease conditions (Astron, 2021a; Astron, 2021b; Pendoley Environmental 2022; Santos, 2022). The applicant currently adheres to the approved *Varanus Island Hub Operations Environment Plan* (Version 9, EA-60-RI-00186) (or later revision approved by the Department of Mines, Industry Regulation and Safety). The environmental plan covers all infrastructure and operational activities for the care and maintenance activities on Airlie Island.

Ten conservation significant fauna species have been recorded on Airlie Island and therefore could potentially occur within the application area:

- wedge-tailed shearwater (*Ardenna pacifica*) (Marine, Migratory);
- crested tern (*Thalasseus bergii*) (Marine, Migratory);
- roseate tern (*Sterna dougallii*) (Marine, Migratory);
- osprey (*Pandion haliaetus*) (Marine, Migratory);
- green turtle (*Chelonia mydas*) (Marine, Migratory, Vulnerable);
- hawksbill turtle (*Eretmochelys imbricata*) (Marine, Migratory, Vulnerable);
- flatback turtle (*Natator depressus*) (Marine, Migratory, Vulnerable);
- Airlie Islands skink (*Ctenotus angusticeps*) (Priority 3);
- lesser crested tern (*Thalasseus bengalensis*) (Marine); and
- white-bellied sea eagle (*Haliaeetus leucogaster*) (Marine).

Airlie Island's sandy beaches are known to support nesting for three vulnerable turtle species: flatback turtle (*Natator depressus*); green turtle (*Chelonia mydas*); and hawksbill turtle (*Eretmochelys imbricata*) (Astron, 2022; Pendoley Environmental, 2022). Marine turtle nesting activity was primarily recorded on the south-west, south-east and north-east sides of Airlie Island (Pendoley Environmental, 2022).

Peak nesting on Airlie Island for green turtles each year occurs between November and March, flatback turtles nest each year between October and March and hawksbill turtles nest from October to February (Santos, 2022). Annual turtle monitoring was

conducted between 10-16 December 2021 and 14-20 March 2022 and a total 15 nests were identified, with nest density being greatest on the north-eastern beach of Airlie Island (Pendoley Environmental, 2022). Three hatchling nest fans belonging to two hawksbill and one unknown species were recorded during the 2021 turtle monitoring and one green turtle hatchling nest fan was recorded during the 2022 turtle monitoring (Pendoley Environmental, 2022). Restricting clearing of native vegetation between October and January may minimise impacts to nesting turtles. Potential impacts to conservation significant fauna as a result of the proposed clearing may be minimised by restricting the clearing between October and April.

Airlie Island is known as a nesting area for seabirds and in particular the Wedge-tailed Shearwater, Roseate Tern, Osprey, Silver Gull, Crested Tern, Lesser Crested Tern and White Bellied Sea Eagle (Santos, 2022; Astron 2021a; GIS Database). Monitoring of seabird colony nesting habitat and the number of breeding pairs on Airlie Island, Varanus Island and five control islands is carried out annually as per the lease conditions (Astron, 2021a).

Nesting habitat for the Wedge-tailed Shearwater has been identified within Airlie Island, with the birds nesting on Airlie Island from November to April (Quadrant Energy, 2016). Crested terns and lesser crested terns were recorded nesting on Airlie Island and control islands (Abutilon and Serrurier Islands) in 2021 (Pendoley Environmental, 2022). Santos (2022) commit to scheduling works outside of peak nesting periods. The majority of the vegetation within the application area has been previously cleared or disturbed, with vegetation immediately outside the application area in a better and healthier condition to provide habitat for conservation significant fauna species (Santos, 2022; GIS Database). Given the investigation works and potential remediation works as part of decommissioning and rehabilitation requirements will be beneficial to the conservation area, and the small size of the proposed clearing (3.9427 hectares), it is unlikely that the proposed clearing will have a significant impact on avifauna species.

Airlie Islands skink (*Ctenotus angusticeps*) is known from 12 locations in the north-west of Western Australia (DaWE, 2022). The most recent study was undertaken in 2011 and the population was estimated to consist of approximately 40 individuals (Quadrant Energy, 2016). Habitat for the skink is strongly associated with tussock grasses (Quadrant Energy, 2016). The species was found to prefer the western side of the island, however they were not necessarily confined to this area, and in locations near existing infrastructure and is presumed that the species is active year round (Quadrant Energy, 2016). The vegetation within the application area is mostly in areas of historic clearing and consists of vegetation regrowth (Santos, 2022; GIS Database), with suitable habitat for this species common outside the application area. Given the small size of the proposed clearing (3.9427 hectares), for the proposed works will be beneficial to the conservation area, the impacts on this fauna species is not considered significant. Potential impacts to conservation significant fauna as a result of the proposed clearing may be minimised by adherence to the environmental management plan such as mandated speed limits, noise and vibration limits.

Conclusion

Based on the above assessment, the proposed clearing will result in a potential impact on nine conservation significant avifauna species, three conservation significant turtle species and one conservation significant reptile. The proposed activities are for investigation works and potential remediation works as part of decommissioning and rehabilitation requirements. These activities are likely to lead to an improvement in the environmental values of the area.

For the reasons set out above, it is considered that the impacts of the proposed clearing on fauna habitat within the application area can be managed by a restricted clearing condition.

The applicant may have notification responsibilities under the EPBC Act for impacts to green turtle, hawksbill turtle and flatback turtle and their habitats, as set out in the EPBC Act.

Conditions

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

- clearing will not be authorised between October and April of each year.

3.3. Relevant planning instruments and other matters

The clearing permit application was advertised on 7 October 2022 by the Department of Mines, Industry Regulation and Safety inviting submissions from the public. No submissions were received in relation to this application.

There are no native title claims over the area under application (DPLH, 2022). The Petroleum Production Licence has been granted in accordance with the future act regime of the *Native Title Act 1993* and the nature of the act (i.e. the proposed clearing activity) has been provided for in that process, therefore, the granting of a clearing permit is not a future act under the *Native Title Act 1993*.

There are no registered Aboriginal Sites of Significance within the application area (DPLH, 2022). It is the proponent's responsibility to comply with the *Aboriginal Heritage Act 1972* and ensure that no Aboriginal Sites of Significance are damaged through the clearing process.

Other relevant authorisations required for the proposed land use include:

- An Environment Plan approved under the *Petroleum and Geothermal Energy Resources Act 1967* or the *Petroleum Pipelines Act 1969*.

It is the proponent's responsibility to liaise with the Department of Water and Environmental Regulation and the Department of Biodiversity, Conservation and Attractions, to determine whether a Works Approval, Water Licence, Bed and Banks Permit, or any other licences or approvals are required for the proposed works.

End

Appendix A. Additional information provided by applicant

Summary of comments	Consideration of comment
Phone call with proponent on 3 October 2020 to confirm boundary of the shapefile is not within ocean and that they are not applying for seagrass clearing. It was confirmed there will be no seagrass removal.	Confirmation of no seagrass removal.

Appendix B. Site characteristics

B.1. Site characteristics

Characteristic	Details
Local context	The application is located on the 'C' class nature reserve, Airlie Island (Crown Reserve 40323), approximately 35 kilometres north-east of Onslow, within the Shire of Ashburton (GIS Database). The area proposed to be cleared is part of an isolated patch of native vegetation and is surrounded by the ocean (GIS Database). The eastern portion of the island has been leased since 1991 to industry to support oil production from offshore fields (Santos, 2022). The proposed clearing area is located wholly within the previously disturbed areas (GIS Database).
Ecological linkage	According to available databases, the application area does not contain any mapped ecological linkages (GIS Database).
Conservation areas	The application area lies wholly within a conservation area, the 'C' class nature reserve, Airlie Island (GIS Database). The application area also occurs within the Island Exmouth Gulf and Rowley Shelf Environmentally Sensitive Area (Register of National Estate) (GIS Database).
Vegetation description	No beard vegetation association has been mapped for Airlie Island, however, the majority of the Pilbara Islands are mapped as Beard vegetation association 117: Hummock grasslands, grass steppe; soft spinifex (GIS Database). Annual vegetation monitoring have identified five vegetation types on Airlie Island: <ul style="list-style-type: none"> • beach association; • foredune association; • grassland; • low shrubland; and • open shrubland (Astron, 2021b).
Vegetation condition	Aerial imagery indicate the vegetation within the proposed clearing area is in Degraded to Good condition (GIS Database). The full Keighery (1994) condition rating scale is provided in Appendix D.
Climate and landform	The region experiences an arid-tropical climate and a mean annual rainfall of 303.8 millilitres (BOM, 2022).
Soil description	The soils within the application area have not been mapped (GIS Database). The soils have been described as sandy poor soils (Santos, 2022).
Land degradation risk	The application area has not been mapped as having land degradation risks (GIS Database).
Waterbodies	The desktop assessment and aerial imagery indicate that there are no watercourses, Ramsar wetlands or wetlands of national importance (ANCA wetlands) within the application area (GIS Database).
Hydrogeography	The application area is not mapped within a proclaimed groundwater area (GIS Database).
Flora	Flora and vegetation monitoring have identified 41 species of flora from 16 families (Astron, 2021b). No conservation significant flora species have been recorded within the application area (Astron, 2021b; GIS Database). Four weed species (<i>Aerva javanica</i> , <i>Flaveria trinervia</i> , <i>Cenchrus ciliaris</i> and <i>Eragrostis minor</i>) has been previously recorded during monitoring surveys (Astron, 2021b). Weed cover has significantly increased at one transect located on the Reserve due to the increase of <i>Cenchrus ciliaris</i> presence (Astron, 2021b).
Ecological communities	The application area is located within the buffer zone of the Priority 3 Ecological Community (PEC) 'Coastal dune native tussock grassland dominated by <i>Whiteochloa airoides</i> ' (GIS Database).

Characteristic	Details
	Database). Available databases indicate that the PEC is situated more towards the western side of the island (GIS Database).
Fauna	No mammal species have been recorded on Airlie Island, however the island supports high value habitats including nesting habitat for migrating birds and breeding habitat for marine turtle species (Astron, 2021a; Pendoley Environmental, 2022; Santos, 2022; GIS Database). Ten conservation significant fauna species occur on Airlie Island, and therefore potentially the application area (Astron, 2021a; Pendoley Environmental, 2022; Santos, 2022).

B.2. Vegetation extent

	Pre-European area (ha)	Current extent (ha)	Extent Remaining %	Current extent in all DBCA managed land (ha)	Current proportion (%) of pre-European extent in all DBCA Managed Lands
IBRA Bioregion - Pilbara	17,808,657.04	17,731,764.88	99.57	1,801,714.98	10.12
Beard vegetation associations - State					
Veg Assoc No. 117	919,517.05	886,005.79	96.36	131,013.19	15.47
Beard vegetation associations - Bioregion					
Veg Assoc No. 117	82,705.78	78,096.64	94.43	17,600.29	21.69

Government of Western Australia (2019)

Appendix C. Assessment against the clearing principles

Assessment against the clearing principles	Variance level	Is further consideration required?
Environmental value: biological values		
<p><u>Principle (a):</u> "Native vegetation should not be cleared if it comprises a high level of biodiversity."</p> <p><u>Assessment:</u></p> <p>The application area is located on Airlie Island, a small, isolated island with poor soils and hot, dry climate (Santos, 2022). The application area is located within the Roeburne subregion of the Pilbara Bioregion of the Interim Biogeographic for Australia (IBRA) (GIS Database). The subregion offshore islands are geologically diverse, however vegetation is generally <i>Spinifex longifolius</i> near beaches and <i>Triodia</i> hummock grasslands elsewhere (CALM, 2002).</p> <p>The application area comprises of five associations (Astron, 2021b). A total of 41 flora species from 16 families have been recorded on the island, no flora species of conservation significance has been recorded on Airlie Island and therefore within the application area (Astron, 2021b). Four weed species have been recorded on Airlie Island, one transect from the previous flora and vegetation monitoring event recorded a significant increase in weed cover.</p> <p>The application area is therefore not likely to contain a high level of biodiversity. However, the proposed clearing may increase the risk of weeds spreading into adjacent native vegetation and may be minimised by the implementation of a weed management condition.</p>	Not likely to be at variance	No
<p><u>Principle (b):</u> "Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna."</p> <p><u>Assessment:</u></p> <p>The application area may contain habitat for a number conservation significant fauna (Astron, 2021a; Pendoley Environmental, 2022; Santos, 2022; GIS Database).</p>	May be at variance	Yes
<p><u>Principle (c):</u> "Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora."</p>	Not likely to be at variance	No

Assessment against the clearing principles	Variance level	Is further consideration required?
<p><u>Assessment:</u></p> <p>No conservation significant flora have been recorded within the application area and on Airlie Island (Astron, 2021b; Santos, 2022).</p>		
<p><u>Principle (d):</u> <i>“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.”</i></p> <p><u>Assessment:</u></p> <p>The application area is not located within a threatened ecological community (Astron, 2021b; Santos, 2022; GIS Database).</p>	Not likely to be at variance	No
Environmental value: significant remnant vegetation and conservation areas		
<p><u>Principle (e):</u> <i>“Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.”</i></p> <p><u>Assessment:</u></p> <p>The application areas fall within the Pilbara Interim Biogeographic Regionalisation of Australia bioregion (GIS Database). No Beard vegetation association has been mapped for Airlie Island, however the majority of the Pilbara Islands are mapped as Beard vegetation association 117: Hummock grasslands, grass steppe; soft spinifex (GIS Database).</p> <p>Historically mapped vegetation on Airlie Island resembles this vegetation association. The Beard vegetation association 117 retains approximately 99% or above of their pre-European extent at both the state and bioregion level (Government of Western Australia, 2014). If it is assumed that the vegetation on Airlie Island is similar to that of Beard vegetation association 117, then the area proposed to be cleared is not a significant remnant of native vegetation.</p> <p>Assessment of aerial imagery confirms that the proposed clearing is within a previously degraded area and that the clearing of native vegetation will be predominately regrowth. Airlie Island has not been extensively clearing except for the area that is being remediated. Further clearing will not reduce the ecological linkages within the local area, and is unlikely to impact the conservation significance of the pre-European vegetation remaining within the local and regional area.</p>	Not at variance	No
<p><u>Principle (h):</u> <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.”</i></p> <p><u>Assessment:</u></p> <p>The application area is located within Airlie Island Nature Reserve, which is a class ‘C’ nature reserve (GIS Database). The application area also occurs within the Islands Exmouth Gulf and Rowley Shelf Environmentally Sensitive Area (Register of National Estate) (GIS Database). According to the Australian Heritage Database (2022) the small islands between Exmouth Gulf and the Mary Anne Group, including Airlie Island, have important seabird nesting areas (Australian Heritage Database, 2022).</p> <p>Despite the application area being on the Register of National Estate and a Nature Reserve, it is considered that the proposed clearing to enable investigation works which will inform decommissioning requirements and rehabilitation works will improve the environmental values of the application area. Given that the proposed clearing is of low impact and of a small scale, the clearing of a maximum of 3.9427 hectares of native vegetation is not likely to significantly impact on the environmental values of the area.</p>	Not likely to be at variance	No
Environmental value: land and water resources		
<p><u>Principle (f):</u> <i>“Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.”</i></p> <p><u>Assessment:</u></p> <p>According to available databases, there are no permanent watercourses or wetlands within the application area (GIS Database).</p>	Not at variance	No

Assessment against the clearing principles	Variance level	Is further consideration required?
<p><u>Principle (g):</u> <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.”</i></p> <p><u>Assessment:</u></p> <p>The proposed clearing of up to 3.9427 hectares of native vegetation within an application area of 3.9427 hectares is considered unlikely to cause any appreciable land degradation. Clearing and disturbance activities will be undertaken in areas already topographically modified since mid-1980’s (Santos, 2022). Given the application area has been historically cleared and disturbed, and the clearing is unlikely to result in large open area of disturbance that would lead to appreciable land degradation.</p>	Not likely to be at variance	No
<p><u>Principle (i):</u> <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.”</i></p> <p><u>Assessment:</u></p> <p>The application area is not located within a Public Drinking Water Source Area (GIS Database).</p> <p>There are no permanent watercourses or water bodies within the application area (GIS Database). Any surface water within the application areas is likely to only remain for short periods following significant rainfall events. The proposed clearing is not likely to cause deterioration in the quality of any surface water within or outside of the application areas.</p> <p>Given the low impact nature of the proposed clearing activities, the proposed clearing is not likely to cause deterioration in the quality of any underground water.</p>	Not likely to be at variance	No
<p><u>Principle (j):</u> <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.”</i></p> <p><u>Assessment:</u></p> <p>The application area consists of sandy soils and experiences a low rainfall (Santos, 2022). Given majority of the proposed clearing is over previously disturbed areas and the reasons stated above, the proposed clearing is not likely to be at variance to this Principle.</p>	Not likely to be at variance	No

Appendix D. 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.

Condition	Description
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 E. Sources of information

F.1. GIS databases

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

- Aboriginal Heritage Places (DPLH-001)
- Aboriginal Heritage Places (DPLH-001)
- Bush Forever (Regional Scheme) (DPLH-022)
- Clearing Regulations – Schedule One Areas (DWER-057)
- DBCA – Lands of Interest (DBCA-012)
- DBCA Legislated Lands and Waters (DBCA-01)
- Environmentally Sensitive Areas (DWER-046)
- Groundwater Salinity Statewide (DWER-026)
- Hydrographic Catchments – Catchments (DWER-028)
- Hydrography – Inland Waters – Waterlines
- Hydrography, Linear (DWER-031)
- Hydrological Zones of Western Australia (DPIRD-069)
- IBRA Vegetation Statistics
- Native Title (ILUA) (LGATE-067)
- Pre-European Vegetation Statistics
- Remnant Vegetation, All Areas
- RIWI Act, Groundwater Areas (DWER-034)
- RIWI Act, Surface Water Areas and Irrigation Districts (DWER-037)
- Soil Landscape Mapping – Best Available (DPIRD-027)
- Soil Landscape Mapping – Rangelands (DPIRD-064)
- WA Now Aerial Imagery

Restricted GIS Databases used:

- Threatened Flora (TPFL)
- Threatened Flora (WAHerb)
- Threatened Fauna
- Threatened Ecological Communities and Priority Ecological Communities
- Threatened Ecological Communities and Priority Ecological Communities (Buffers)

F.2. References

- BoM (2022) Bureau of Meteorology Website – Climate Data Online, Marble Bar. Bureau of Meteorology.
- Astron (2021a) Environmental Monitoring Program Varanus and Airlie Islands Seabird Monitoring Annual Report. Unpublished report prepared for Santos WA Energy Limited, June 2021.
- Astron (2021b) Santos Environmental Monitoring Program Airlie Island Flora, Vegetation and Weed Monitoring Annual Report. Unpublished report prepared for Santos WA Energy Limited, March 2021.
- Australian Heritage Database (2022) Department of the Environment. Australian Government, http://www.environment.gov.au/cgi-bin/ahdb/search.pl?mode=place_detail;place_id=10050. (Accessed 27 October 2022).
- Commonwealth of Australia (2001) *National Objectives and Targets for Biodiversity Conservation 2001-2005*, Canberra.
- DaWE (2022) Species Profile and Threats Database. Department of Agriculture, Water and the Environment. <http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl>
- Department of Environment Regulation (DER) (2013) *A guide to the assessment of applications to clear native vegetation*. Perth. Available from: https://www.der.wa.gov.au/images/documents/your-environment/native-vegetation/Guidelines/Guide2_assessment_native_veg.pdf
- Department of Planning, Lands and Heritage (DPLH) (2022) Aboriginal Heritage Inquiry System. Department of Planning, Lands and Heritage. <https://espatial.dplh.wa.gov.au/AHIS/index.html?viewer=AHIS> (Accessed 27 October 2022).
- Department of Primary Industries and Regional Development (DPIRD) (2022) NRInfo Digital Mapping. Department of Primary Industries and Regional Development. Government of Western Australia. URL: <https://dpiird.maps.arcgis.com/apps/webappviewer/index.html?id=662e8cbf2def492381fc915aaf3c6a0f> (27 October 2022).
- Department of Water and Environmental Regulation (DWER) (2021) Procedure: Native vegetation clearing permits. Joondalup. Available from: https://dwer.wa.gov.au/sites/default/files/Procedure_Native_vegetation_clearing_permits_v1.pdf
- Government of Western Australia (2019) 2018 Statewide Vegetation Statistics incorporating the CAR Reserve Analysis (Full Report). Current as of March 2019. WA Department of Biodiversity, Conservation and Attractions. <https://catalogue.data.wa.gov.au/dataset/dbca-statewide-vegetation-statistics>

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4. Glossary

Acronyms:

BC Act	<i>Biodiversity Conservation Act 2016</i> , Western Australia
BoM	Bureau of Meteorology, Australian Government
DAA	Department of Aboriginal Affairs, Western Australia (now DPLH)
DAFWA	Department of Agriculture and Food, Western Australia (now DPIRD)
DAWE	Department of Agriculture, Water and the Environment, Australian Government
DBCA	Department of Biodiversity, Conservation and Attractions, Western Australia
DER	Department of Environment Regulation, Western Australia (now DWER)
DMIRS	Department of Mines, Industry Regulation and Safety, Western Australia
DMP	Department of Mines and Petroleum, Western Australia (now DMIRS)
DoEE	Department of the Environment and Energy (now DAWE)
DoW	Department of Water, Western Australia (now DWER)
DPaW	Department of Parks and Wildlife, Western Australia (now DBCA)
DPIRD	Department of Primary Industries and Regional Development, Western Australia
DPLH	Department of Planning, Lands and Heritage, Western Australia
DRF	Declared Rare Flora (now known as Threatened Flora)
DWER	Department of Water and Environmental Regulation, Western Australia
EP Act	<i>Environmental Protection Act 1986</i> , Western Australia
EPA	Environmental Protection Authority, Western Australia
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i> (Federal Act)
GIS	Geographical Information System
ha	Hectare (10,000 square metres)
IBRA	Interim Biogeographic Regionalisation for Australia
IUCN	International Union for the Conservation of Nature and Natural Resources – commonly known as the World Conservation Union
PEC	Priority Ecological Community, Western Australia
RIWI Act	<i>Rights in Water and Irrigation Act 1914</i> , Western Australia
TEC	Threatened Ecological Community

Definitions:

{**DBCA (2019) Conservation Codes for Western Australian Flora and Fauna. Department of Biodiversity, Conservation and Attractions, Western Australia**):-

T **Threatened species:**

Listed by order of the Minister as Threatened in the category of critically endangered, endangered or vulnerable under section 19(1), or is a rediscovered species to be regarded as threatened species under section 26(2) of the *Biodiversity Conservation Act 2016* (BC Act).

Threatened fauna is that subset of ‘Specially Protected Fauna’ listed under schedules 1 to 3 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for Threatened Fauna.

Threatened flora is that subset of ‘Rare Flora’ listed under schedules 1 to 3 of the *Wildlife Conservation (Rare Flora) Notice 2018* for Threatened Flora.

The assessment of the conservation status of these species is based on their national extent and ranked according to their level of threat using IUCN Red List categories and criteria as detailed below.

CR **Critically endangered species**

Threatened species considered to be “*facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with criteria set out in the ministerial guidelines*”.

Listed as critically endangered under section 19(1)(a) of the BC Act in accordance with the criteria set out in section 20 and the ministerial guidelines. Published under schedule 1 of the *Wildlife*

Conservation (Specially Protected Fauna) Notice 2018 for critically endangered fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for critically endangered flora.

EN Endangered species

Threatened species considered to be “*facing a very high risk of extinction in the wild in the near future, as determined in accordance with criteria set out in the ministerial guidelines*”.

Listed as endangered under section 19(1)(b) of the BC Act in accordance with the criteria set out in section 21 and the ministerial guidelines. Published under schedule 2 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for endangered fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for endangered flora.

VU Vulnerable species

Threatened species considered to be “*facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with criteria set out in the ministerial guidelines*”.

Listed as vulnerable under section 19(1)(c) of the BC Act in accordance with the criteria set out in section 22 and the ministerial guidelines. Published under schedule 3 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for vulnerable fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for vulnerable flora.

Extinct Species:

EX Extinct species

Species where “*there is no reasonable doubt that the last member of the species has died*”, and listing is otherwise in accordance with the ministerial guidelines (section 24 of the BC Act).

Published as presumed extinct under schedule 4 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for extinct fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for extinct flora.

EW Extinct in the wild species

Species that “*is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; and it has not been recorded in its known habitat or expected habitat, at appropriate seasons, anywhere in its past range, despite surveys over a time frame appropriate to its life cycle and form*”, and listing is otherwise in accordance with the ministerial guidelines (section 25 of the BC Act).

Currently there are no threatened fauna or threatened flora species listed as extinct in the wild. If listing of a species as extinct in the wild occurs, then a schedule will be added to the applicable notice.

Specially protected species:

Listed by order of the Minister as specially protected under section 13(1) of the BC Act. Meeting one or more of the following categories: species of special conservation interest; migratory species; cetaceans; species subject to international agreement; or species otherwise in need of special protection.

Species that are listed as threatened species (critically endangered, endangered or vulnerable) or extinct species under the BC Act cannot also be listed as Specially Protected species.

MI Migratory species

Fauna that periodically or occasionally visit Australia or an external Territory or the exclusive economic zone; or the species is subject of an international agreement that relates to the protection of migratory species and that binds the Commonwealth; and listing is otherwise in accordance with the ministerial guidelines (section 15 of the BC Act).

Includes birds that are subject to an agreement between the government of Australia and the governments of Japan (JAMBA), China (CAMBA) and The Republic of Korea (ROKAMBA), and fauna subject to the *Convention on the Conservation of Migratory Species of Wild Animals* (Bonn Convention), an environmental treaty under the United Nations Environment Program. Migratory species listed under the BC Act are a subset of the migratory animals, that are known to visit Western Australia, protected under the international agreements or treaties, excluding species that are listed as Threatened species.

Published as migratory birds protected under an international agreement under schedule 5 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

CD Species of special conservation interest (conservation dependent fauna)

Fauna of special conservation need being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened, and listing is otherwise in accordance with the ministerial guidelines (section 14 of the BC Act).

Published as conservation dependent fauna under schedule 6 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

- OS Other specially protected species**
Fauna otherwise in need of special protection to ensure their conservation, and listing is otherwise in accordance with the ministerial guidelines (section 18 of the BC Act).
Published as other specially protected fauna under schedule 7 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.
- P Priority species:**
Possibly threatened species that do not meet survey criteria, or are otherwise data deficient, are added to the Priority Fauna or Priority Flora Lists under Priorities 1, 2 or 3. These three categories are ranked in order of priority for survey and evaluation of conservation status so that consideration can be given to their declaration as threatened fauna or flora.
Species that are adequately known, are rare but not threatened, or meet criteria for near threatened, or that have been recently removed from the threatened species or other specially protected fauna lists for other than taxonomic reasons, are placed in Priority 4. These species require regular monitoring.
Assessment of Priority codes is based on the Western Australian distribution of the species, unless the distribution in WA is part of a contiguous population extending into adjacent States, as defined by the known spread of locations.
- P1 Priority One - Poorly-known species**
Species that are known from one or a few locations (generally five or less) which are potentially at risk. All occurrences are either: very small; or on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, road and rail reserves, gravel reserves and active mineral leases; or otherwise under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes. Such species are in urgent need of further survey.
- P2 Priority Two - Poorly-known species**
Species that are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation, e.g. national parks, conservation parks, nature reserves and other lands with secure tenure being managed for conservation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes. Such species are in urgent need of further survey.
- P3 Priority Three - Poorly-known species**
Species that are known from several locations, and the species does not appear to be under imminent threat, or from few but widespread locations with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Species may be included if they are comparatively well known from several locations but do not meet adequacy of survey requirements and known threatening processes exist that could affect them. Such species are in need of further survey.
- P4 Priority Four - Rare, Near Threatened and other species in need of monitoring**
(a) Rare. Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection but could be if present circumstances change. These species are usually represented on conservation lands.
(b) Near Threatened. Species that are considered to have been adequately surveyed and that are close to qualifying for vulnerable but are not listed as Conservation Dependent.
(c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.

Principles for clearing native vegetation:

- (a) Native vegetation should not be cleared if it comprises a high level of biological diversity.
- (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.
- (c) Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora.
- (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.
- (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.
- (f) Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.

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