GOVERNMENT OF
WESTERN AUSTRALIA

CLEARING PERMIT

Granted under section 51E of the Environmental Protection Act 1986

Purpose Permit number:	CPS 9332/1
Permit Holder:	Parks Australia, Christmas Island National Park
Duration of Permit:	From 15 October 2021 to 15 October 2026

The permit holder is authorised to clear *native vegetation* subject to the following conditions of this permit.

PART I – CLEARING AUTHORISED

1. Clearing authorised (purpose)

The permit holder is authorised to clear *native vegetation* for the purpose of minefield rehabilitation.

2. Land on which clearing is to be done

Unallocated Crown Land (PIN 1097162), Christmas Island (former Mine lease ML116 Block 3 now called Field 22A (116B3)).

3. Clearing authorised

The permit holder must not clear more than 3.31 hectares of *native vegetation* within the area cross-hatched yellow in Figure 1 of Schedule 1.

PART II – MANAGEMENT CONDITIONS

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

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

(a) avoid the clearing of *native vegetation*;

(b) minimise the amount of *native vegetation* to be cleared; and

(c) reduce the impact of *clearing* on any environmental value.

5. Weed management

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

(a) clean earth-moving machinery of soil and vegetation prior to entering and leaving the area to be cleared;

(b) ensure that no known *weed*-affected soil, mulch, fill, or other material is brought into the area to be cleared;

(c) restrict the movement of machines and other vehicles to the limits of the areas to be cleared.

PART III - RECORD KEEPING AND REPORTING

6. Records that must be kept

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

Table 1: Records that must be kept

No.	Relevant matter	Specifications
1.	In relation to the authorised clearing activities generally	(a) the species composition, structure, and density of the cleared area; (b) the location where the clearing occurred, recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 1994 (GDA94), expressing the geographical coordinates in Eastings and Northings; (c) the date that the area was cleared; (d) the size of the area cleared (in hectares); (e) actions taken to avoid, minimise, and reduce the impacts and extent of clearing in accordance with condition 4; and (f) actions taken to minimise the risk of the introduction and spread of *weeds* in accordance with condition 5.

7. Reporting

The permit holder must provide to the *CEO* the records required under condition 6 of this permit when requested by the *CEO*.

DEFINITIONS

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

Table 2: Definitions

Term	Definition
CEO	Chief Executive Officer of the department responsible for the administration of the clearing provisions under the *Environmental Protection Act 1986*.
clearing	has the meaning given under section 3(1) of the EP Act.
condition	a condition to which this clearing permit is subject under section 51H of the EP Act.
department	means the department established under section 35 of the *Public Sector Management Act 1994* (WA) and designated as responsible for the administration of the EP Act, which includes Part V Division 3.
EP Act	*Environmental Protection Act 1986* (WA)
native vegetation	has the meaning given under section 3(1) and section 51A of the EP Act.
weeds	means any plant – (a) that is a declared pest under section 22 of the *Biosecurity and Agriculture Management Act 2007*; or (b) published in a Department of Biodiversity, Conservation and Attractions species-led ecological impact and invasiveness ranking summary, regardless of ranking; or (c) not indigenous to the area concerned.

END OF CONDITIONS

Mathew Gannaway
MANAGER
NATIVE VEGETATION REGULATION

Officer delegated under Section 20
of the Environmental Protection Act 1986

21 September 2021

Schedule 1

Plan 9332/1

The boundary of the area authorised to be cleared is shown in the map below.

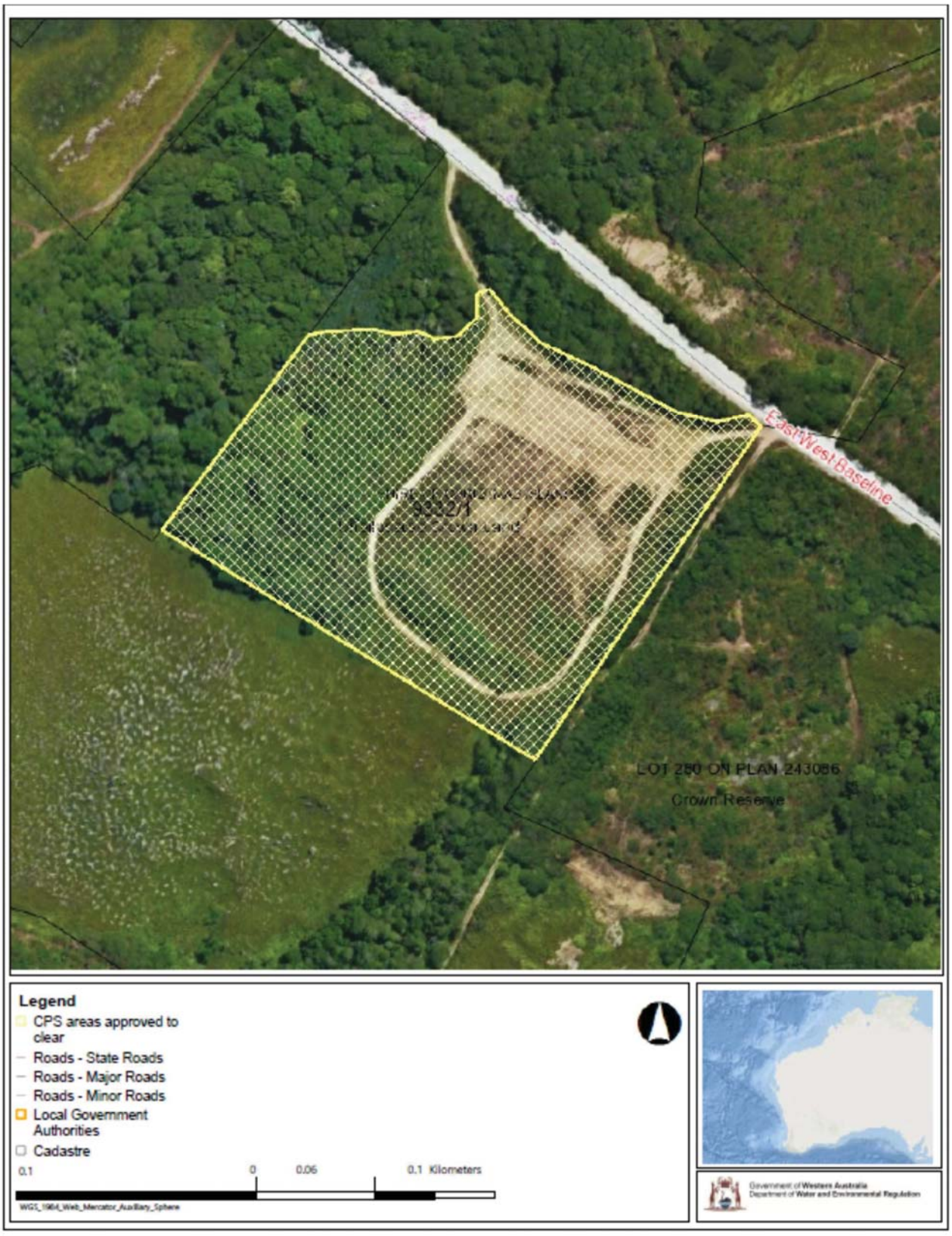

Figure 1: Map of the boundary of the area within which clearing may occur

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 9332/1
Permit type:	Purpose permit
Applicant name:	Parks Australia, Christmas Island National Park
Application received:	18 June 2021
Application area:	3.31 hectares of native vegetation
Purpose of clearing:	Minefield rehabilitation
Method of clearing:	Mechanical Removal
Property:	Unallocated Crown Land (PIN 1097162), Christmas Island (former Mine lease ML116 Block 3 now called Field 22A (116B3))
Location (LGA area/s):	Shire of Christmas Island
Localities (suburb/s):	Christmas Island

1.2. Description of clearing activities

The vegetation proposed to be cleared is contained within a single contiguous area and is surrounded by Christmas Island National Park (see Figure 1, Section 1.5).

1.3. Decision on application

Decision:	Granted
Decision date:	21 September 2021
Decision area:	3.31 hectares of native vegetation, as depicted in Section 1.5, below.

1.4. Reasons for decision

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

In making this decision, the Delegated Officer had regard for the site characteristics (see 0), relevant datasets (see Appendix E.1), and photographs provided by the applicant (see Appendix F), the clearing principles set out in Schedule 5 of the EP Act (see Appendix B), relevant planning instruments and any other matters considered relevant to the assessment (see Section 3). The Delegated Officer also took into consideration the purpose of the clearing which is to provide topsoil to support rehabilitation of cleared land within Christmas Island.

The assessment identified that the proposed clearing may result in the introduction and/or spread of weeds into adjacent conservation areas, which could impact on the quality of the adjacent vegetation and its habitat values.

After consideration of the available information, as well as the applicant's minimisation and mitigation measures (see Section 3.1), the Delegated Officer determined the proposed clearing is unlikely to have long-term adverse impacts on conservation areas, threatened fauna or flora and can be minimised and managed to be unlikely to lead to an unacceptable risk to environmental values.

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

- avoid, minimise to reduce the impacts and extent of clearing; and
- take hygiene steps to minimise the risk of the introduction and spread of weeds.

1.5. Site map

Figure 1 Map of the application area

The area crosshatched yellow indicates the area 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:

- *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act)

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

The applicant advised that 1.2 hectares of good quality regrowth within the stockpile area (total of 4.5 hectares) was excluded from the application area to minimise the potential impacts of the proposed clearing on native vegetation.

In addition, the applicant advised that as many native trees (especially where they are standing on less than 1m soil) will be avoided and where possible, they will aim to selectively manoeuvre around these to remove introduced weeds and recover soil (Parks Australia, 2021).

Post clearing, the application area will be rehabilitated with 10,000 native trees sourced from the Christmas Island National Park nursery. The aim of the proposed clearing and rehabilitation works is to improve the site and ecosystem function of the application area (Parks Australia, 2021).

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 0) and the extent to which the impacts of the proposed clearing present a risk to biological, conservation, or land and water resource values.

The assessment against the clearing principles (see **Error! Reference source not found.**) identified that the impacts of the proposed clearing present a risk to biological values (fauna, adjacent flora and vegetation) and conservation areas. 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, Flora) and conservation areas- Clearing Principles (b)(c) and (h)

Assessment

Fauna

Christmas Island provides habitat for several species of fauna indigenous to the island including fourteen native bird species and nine species of seabird which use the island for breeding. Four seabird taxa and nine land bird taxa are endemic to the island. A further 108 migratory or vagrant bird species have been recorded on the island. Six of the island's endemic birds are listed as threatened under the *Environment Protection and Biodiversity Conservation Act* 1999 (EPBC Act). One endemic native mammal, the Christmas Island Flying fox and five endemic reptiles, also occur on Christmas Island. Christmas Island also supports three conservation significant crab species, being the red crab, robber crab and blue crab. Blue crabs have a restricted range and do not occur within the application area.

Red Crabs (*Gecarcoidea natalis*) occur within the rainforest of Christmas Island, and also inhibit a variety of other habitats including limestone pinnacle areas on the coastal shore terraces and domestic gardens. The only habitat they are not found in are the areas cleared of rainforest and stripped of soil for phosphate mining. Current estimates of population size are about 50-60 million (Orchard, 2015). The application area is not located in areas where high densities of red crabs barrows have been previously recorded. No red crabs were observed within the proposed clearing area during three site visits between April and June 2021 conducted by Parks Australia (Parks Australia, 2021). However, several skeletons were found in the open area presumably from crabs that had died trying to cross the application area during the last migration. Given this and that the majority of the proposed clearing is dominated by an open area with a high weed cover, is not considered to provide significant habitat for this species.

The Christmas Island Pipistrelle (*Pipistrellus murrayi*) is an endemic bat species that is listed as Endangered under the EPBC Act. The pipistrelle roosts in primary rainforest under exfoliating bark on trunks, under dead fronds, beneath Strangler Figs against the trunk of a canopy tree and in a tree hollow (DotE, 2015). The application area is unlikely to contain critical habitat for this species given the lack of primary rainforest habitat.

The Giant Gecko (*Cyrtodactylus sadleiri*) has been recorded within 300 metres of the application area. The Giant Gecko is endemic to Christmas Island and is listed as endangered under the EPBC Act. This species is widespread

across Christmas Island, occurring in all habitats except areas lacking in tree or shrub cover (DotE, 2013). Cogger and Sadlier (1981) reported that in their 1979 sampling the Giant Gecko was most commonly encountered in primary rainforest on the plateau of Christmas Island – where population density was very high (DotE, 2013). Given the predominately degraded condition of the application area, it is unlikely to contain significant habitat for this species.

The Abbott's Booby (*Papasula abbotti*) is a long-lived seabird with the only known extant nesting colony on Christmas Island. This species is listed as Endangered under the EPBC Act. On Christmas Island, most nests are situated on the central and western areas, in the tall plateau forest, but they are also found along the north coast, in the upper terrace forest. Nest sites are largely restricted to areas above 150m, mostly on the sides of northwest facing slopes (DEH, 2004). Currently, most remaining habitat is protected within Christmas Island National Park.

Abbott's Booby pairs build a stick nest about 10-40 metres from the ground in an open crowned emergent tree. The pair moves nest sites only if they have been repeatedly unsuccessful, or the site has been destroyed. When displaced they move only a short distance (Nelson and Powell 1986, Reville et al. 1990) therefore it takes a pair many years to move away from an area of disturbance.

The Applicant has advised that during three site visits between April and June 2021, no bird nests of forest birds or Abbott's Booby were found (Parks Australia, 2021). Given the predominantly degraded condition of the vegetation under application and that it has been previously cleared, it is not considered likely for the application area to provide nesting sites or represent significant habitat for this species.

Southeast winds exist between April and November on Christmas Island. Wind tunnel experiments have demonstrated that clearing forest increases turbulence in the canopy (Brett, 1989 in Boland et al. 2012), lowering fidelity, and increasing adult mortality of Abbott's Booby nesting in surrounding areas (Reville et al. 1990 in Boland et al. 2012). Studies have shown that birds nesting within 300 metres of the areas cleared for mining activities suffered lower breeding success and increased mortality because of greater wind turbulence (Reville et al. 1990 and Brett, 1989 in Boland et al. 2012). Removal of stockpiles which are extensively covered by regrowth will create further openings within the forest and may result in increased wind turbulence, impacting nesting sites that occur downwind (DEH, 2004).

According to available databases, the closest nesting sites recorded for this species is 96, 263 and 289 meters to the northwest. An additional 16 recorded nesting sites occur within a 5 kilometre radius of the proposed clearing.

The vegetation within the application area has been previously cleared and disturbed by previous mining activities. The purpose of the proposed clearing is to clear weeds and degraded vegetation to access quality topsoil. This topsoil will be respread, and seeds will be planted to re-establish rainforest, improving the ecological function of the application area. Given this and the open and degraded condition of the existing vegetation within the application area, the proposed clearing is unlikely to significantly impact these Abbott's Booby nesting sites.

Flora
Christmas Island is home to 237 native plant species, including 17 endemic species which are not found anywhere else in the world (DotE, 2015a).

Christmas Island is home to three flora species listed as Threatened under the EPBC Act. These three species are *Asplenium listeri* (Christmas Island Spleenwort), *Tectaria devexa* var. minor and *Pneumatopteris truncate*. No priority flora species are listed for Christmas Island. The applicant has advised that a comprehensive search determined there are no threatened or rare native plants within the application area (Parks Australia, 2021).

Conservation Areas
The application area is adjacent to Christmas Island National Park which borders the application area on the northern and southern sides. Given this, the proposed clearing has the potential to introduce and/or spread weeds into the adjacent Christmas Island National Park, which could impact on the quality of the adjacent vegetation and its habitat values.

Conclusion
Based on the above assessment, the proposed clearing may result in the spread of weeds into the adjacent Christmas Island National Park. For the reasons set out above, it is considered that the impacts of the proposed clearing can be managed by taking steps to minimise the risk of the introduction and spread of weeds and does not constitute a significant residual impact. It is also noted that the purpose of clearing is to rehabilitate the proposed clearing area back to high value rainforest.

Conditions

To address the above impacts, a weed management condition will be placed on the permit.

3.3. Relevant planning instruments and other matters

The Shire of Christmas Island advised DWER that local government approvals are not required, and that they have no objections to the proposed clearing (Shire of Christmas Island, 2021).

There are no Aboriginal Sites of Significance or Native Title Claims on Christmas Island.

The proposal has not been referred to the Department of Agriculture, Water and the Environment under the EPBC Act.

End

Appendix A. Site characteristics

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

A.1. Site characteristics

Characteristic	Details
Local context	Christmas Island retains approximately 75 per cent native vegetation, of which 84 per cent (63 per cent of total island area) is protected as National Park. The proposed clearing area has previously cleared for the purpose of phosphate mining and consists of degraded regrowth and is surrounded by intact forest. Therefore, it is not considered to be an important remnant of native vegetation in a highly cleared landscape.
Ecological linkage	The application area is not part of a formal or informal ecological linkage.
Conservation areas	The application area is adjacent to Christmas Island National Park which borders the application area on the northern and southern sides.
Vegetation description	Photographs supplied by the applicant indicate the vegetation within the proposed clearing area predominantly (2.2 ha) consists of bare ground with low weeds (such as mile-a-minute vine *Mikania micrantha*) and the remainder (1.11 ha) is weed-dominated secondary regrowth. Common weeds in this area include False Coffee Bush (*Leucaena leucocephala*), Black Sage (*Cordia curassavica*), Yellow Guava (*Psidium guajava*), Jamaican Cherry (*Muntingia calabura*), 'Gotcha' sensitive weed (*Mimosa diplotricha*), snakeweed (*Stachytarpheta cayennensis*), and others. Swordfern (*Nephrolepis biserrata)* is extensive through the site (Parks Australia, 2021). Native species identified at the site include *Macaranga tanarius*, *Pittosporum ferrugineum, Dysoxylum gaudichaudianum, Pandanus elatus, Maclura cochinchinensis*, *Melochia umbellate, Pipturus argenteus, Claoxylon indicum, Arenga listeri,* and *Syzygium nervosum* (Parks Australia, 2021). Representative photos are available in Appendix DD. This is consistent with the below mapping: **Mixed weed and pioneer regrowth** — Regrowth vegetation with a mean tree height of <5m. Can vary between native and introduced species depending on the location and time since clearing. Tends to have a higher occurrence of weed species compared to the 'Regrowth' category. — *Muntingia calabura, Psidium sp.(Guava), Mimosa, Passionfruit, Macaranga* **Regrowth** — Generally, well developed regrowth vegetation over 5m mean tree height. May include some introduced or weed species. — Various species – dependent on adjacent vegetation **Not Vegetated** — Bare ground with weed species (Geoscience Australia, 2014)
Vegetation condition	Photographs supplied by the applicant indicate the majority of the vegetation within the proposed clearing area is in a degraded to good (Keighery, 1994) condition. The full Keighery (1994) condition rating scale is provided in Appendix CC. Representative photos are available in Appendix D.
Climate and landform	The Island is the summit of a submarine mountain. It rises steeply to a central plateau dominated by stands of rainforest. The plateau reaches heights of up to 361 metres and consists mainly of limestone with layers of volcanic rock. The Island's 80 kilometre coastline is an almost continuous sea cliff, ranging in height to 20 metres. In a few places

Characteristic	Details
	(about 13) breaks in the cliff give way to shallow bays and small sand and coral beaches. The largest of these bays forms the Island's port at Flying Fish Cove. The Island is surrounded by an encircling coral reef. There is virtually no coastal shelf and the sea plummets to a depth of about 5000 metres within 200 metres of the shore. The climate is tropical and temperatures range from 21°C to 32°C. Humidity is around 80-90% and south-east trade winds provide pleasant weather for most of the year. During the wet season, November to April, it is common for some storm activity to occur, producing a swell in seas around the island. The average rainfall is 2,000 mm per annum.
Soil description	The soil is mapped as unconsolidated material – mostly phosphatic soils.
Waterbodies	Perennial surface water features on Christmas Island are limited to spring fed streams on coastal or sloping areas of the Island. No watercourses are located within the application area. The desktop assessment and aerial imagery indicated that the closest wetland/watercourse is 'The Dales' RAMSAR wetland located 3.9km west of the application area.
Ecological communities	No threatened ecological communities occur on Christmas Island

A.2. Flora analysis table.

With consideration for the site characteristics set out above, relevant datasets (see Appendix E.1), impacts to the following conservation significant flora required further consideration.

Species name	Conservation status	Suitable habitat features? [Y/N]	Suitable vegetation type? [Y/N]	Suitable soil type? [Y/N]	Distance of closest record to application area (km)	Are surveys adequate to identify? [Y, N, N/A]
Tectaria devexa var. minor	Endangered under the EPBC Act	N	N	N	1.3km	Y
Asplenium listeri	Critically endangered under EPBC Act	N	N	N	0.9 km	Y
Pneumatopteris truncata	Critically endangered under EPBC Act	N	N	N	1.5 km	Y

A.3. Fauna analysis table

Species name	Conservation status	Suitable habitat features? [Y/N]	Suitable vegetation type? [Y/N]	Distance of closest record to application area (km)	Are surveys adequate to identify? [Y, N, N/A]
Abbott's Booby (*Papasula abbotti*)	Endangered	N	N	0.096	N/A
Red Crab (*Gecarcoidea natalis*)	Conservation significant	N	Y	within	N/A

Species name	Conservation status	Suitable habitat features? [Y/N]	Suitable vegetation type? [Y/N]	Distance of closest record to application area (km)	Are surveys adequate to identify? [Y, N, N/A]
Christmas Island Pipistrelle (*Pipistrellus murrayi*)	Critically Endangered	N	N	0.300	N/A
Giant Gecko *(Cyrodactylus sadleiri)*	Endangered	N	N	0.300	N/A

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 area proposed to be cleared is unlikely to contain significant flora, fauna, habitats, or assemblages of plants due to the predominately degraded condition of the vegetation.	Not likely to be at variance	No
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 proposed clearing may impact nesting habitat for conservation significant fauna listed under the EPBC Act.	May be at variance	Yes *Refer to Section 3.2.1, above.*
Principle (c): *"Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora."* Assessment: Given the predominantly degraded condition of the vegetation within the application area, the area proposed to be cleared is unlikely to contain habitat for flora species listed under the EPBC Act. .	Not likely to be at variance	Yes
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: No threatened ecological communities occur within Christmas Island.	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 extent of the mapped vegetation type and extent of native vegetation in the local area is consistent with the national objectives and targets for biodiversity conservation in Australia. The vegetation proposed to be cleared is not considered to be part of a significant ecological linkage in the local area.	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: The nearest conservation area to the application area is Christmas Island National Park which is adjacent to the application area. Given this, the proposed clearing may have an impact on the environmental values of this conservation area.	May be at variance	Yes *Refer to Section 3.2.1, above.*

Assessment against the clearing principles	Variance level	Is further consideration required?
Environmental value: land and water resources		
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, water quality or wetland dependent vegetation.	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 may be susceptible to water erosion. Noting the small extent of the application area and that it is surrounded by vegetation, the proposed clearing is not likely to have an appreciable impact on land degradation in the form of wind or water erosion, nutrient export or salinity.	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 or in close proximity to 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 or in close proximity to 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 Southwest 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 (Parks Australia, 2021)

Figure 3: Waypoint 1, looking SSW

Figure 5: Waypoint 3, looking East

Figure 6: Waypoint 4, looking SW. Note swordfern and Leucaena leucocephala amongst secondary regrowth.

Figure 11: Waypoint 9, looking NE

Figure 13: Waypoint 11, looking East

Figure 16: Waypoint 14, looking SW. Note that three-quarters of the site is bare ground with low weeds.

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)
- Cadastre (LGATE-218)
- Contours (DPIRD-073)
- Environmentally Sensitive Areas (DWER-046)
- Imagery
- Ramsar Sites (DBCA-010)

Restricted GIS Databases used:

- ICMS (Incident Complaints Management System) – Points and Polygons
- Threatened Flora (TPFL)
- Threatened Flora (WAHerb)
- Threatened Fauna
- Red Crab Burrow Density Grid
- Abbott Booby Nests (2012)
- Known Giant Gecko locations (2013)
- Known Abbotts Locations (2015)
- Red Crab Fence
- Vegetation Level 1 (2013)
- National Park Boundary
- RAMSAR Wetlands (2013)

E.2. References

Brett, D. (1989) Sea birds in the trees. Ecos 61:4–8

Boland C.R.J., Smith M.J, Maple D, Tiernan B and Napier F. (2012) An island-wide survey of Abbott's Booby *Papasula Abbotti* occupancy on Christmas Island, Indian Ocean.

Department of the Environment and Heritage (DotE) (2013) Conservation Advice for *Cyrodactylus sadleiri* (Giant Gecko). Department of the Environment and Heritage, Canberra

Department of the Environment and Heritage (DotE) (2015) National Recovery Plan for the *Pipistrellus murrayi.* Department of the Environment and Heritage, Canberra

Department of the Environment and Heritage (DotE) (2004) National Recovery Plan for the Abbott's Booby Papasula abbotti. Department of the Environment and Heritage, Canberra.

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 Water and Environmental Regulation (DWER) (2019). *Procedure: Native vegetation clearing permits*. Joondalup. Available from: https://dwer.wa.gov.au/sites/default/files/Procedure_Native_vegetation_clearing_permits_v1.PDF.

Keighery, B.J. (1994) *Bushland Plant Survey: A Guide to Plant Community Survey for the Community*. Wildflower Society of WA (Inc). Nedlands, Western Australia.

Geoscience Australia (2014). Christmas Island Vegetation and Clearing Map. Compiled May 2014. Prepared By Geoscience Australia in Collaboration with Christmas Island Phosphates and The Commonwealth Department of Environment.

Orchard, M (2015) Crabs of Christmas Island **Error! Hyperlink reference not valid.** (Accessed August 2021)

Parks Australia (2021) Clearing permit application CPS 9332/1 and supporting information, received 18 June 2021 (DWER Ref: DWERDT466862).

Reville, B., J. Tranter and H. Yorkston (1990). Impact of forest clearing on the endangered seabird Sula abbotti. Biological Conservation. 51:23-38.

Shire of Christmas Island (2021) Advice for clearing permit application CPS 9332/1, received July 2021 (DWER Ref: A2026840).