Report

Environmental Review Document

Bonney Downs Wind Farm

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Bonney Downs Wind Farm
Environmental Review Document

Proponent

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A	Draft for Fortescue Review	20/05/2025
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Task	Name	Company	Signature	Date
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EXECUTIVE SUMMARY

Pilbara Energy (Generation) Pty Ltd (PEG), a wholly owned subsidiary of Fortescue Limited (Fortescue), is proposing to develop the Bonney Downs Wind Farm, comprising a wind farm and associated supporting infrastructure (the Proposal). The Proposal is located approximately 9 km southwest of Nullagine (at the northern extent of the Proposal). The southern edge of the Proposal is adjacent to Fortescue's Christmas Creek Iron Ore Mine Expansion project (as per the Development Envelope approved by Ministerial Statement (MS) 1033).

The Proposal will involve the installation of up to 100 wind turbines and associated infrastructure, with a target installed renewable energy capacity of approximately 2.1 Gigawatts (GW). The Proposal will connect with the Nullagine Pilot Wind Farm to link into the wider Fortescue Integrated Power Network. The Proposal includes a Development Envelope (DE) of 89,973.86 ha within which an Indicative Disturbance Footprint (IDF) of 944.07 ha is anticipated.

Background and Context

The purpose of this Environmental Review Document (ERD) is to present an Environmental Impact Assessment (EIA) of the Proposal to support the referral of the Proposal to the Environmental Protection Authority (EPA) under section 38 of the *Environmental Protection Act 1986* (EP Act). This ERD has been prepared in accordance with the EPA's '*Instructions on how to prepare an Environmental Review Document*' (EPA, 2024a) and is based on project and study information available at the time of writing.

Overview of the Proposal

The physical, construction and operational elements required under section 38 of the EP Act are summarised in Table ES-1 and Table ES-2.

Table ES-1: Proposal Summary

Item	Description
Proposal Title	Bonney Downs Wind Farm
Proponent Name	Pilbara Energy (Generation) Pty Ltd
Short Description	The Proposal is for the construction and operation of the Bonney Downs Wind Farm to connect with the Fortescue Integrated Power Network. The Proposal comprises the installation of wind turbines, substations, 33 kV reticulation to collect power from wind turbines, associated supporting infrastructure, and linear supporting infrastructure such as roads, pipelines and corridors for overhead electrical reticulation. The Proposal is located approximately 9 km southwest of Nullagine (at the northern extent of the Proposal) in the Shire of East Pilbara and Palyku and Nyiyaparli Native Title Determination areas.

Table ES-2: Proposal Content Elements

Element	Location	Proposed Extent
Physical Elements		
Wind Farm elements: • Wind turbines and hardstands, • Overhead electrical reticulation (33 kV), and • Substations and switchyards.	Figure 3-2	Development Envelope of 89,973.86 ha, including: Indicative Disturbance Footprint up to 944.07 ha Clearing of native vegetation up to 910.25 ha, including: • 443.39 ha of permanent clearing, and • 466.86 ha of temporary clearing.
Supporting and ancillary infrastructure elements: • Access roads and service corridors, • Accommodation camps (construction and permanent), • Wastewater treatment plant, • Laydown areas, • Concrete batching, • Explosives storage, preparation facilities and hydrocarbon storage, • Waste management and landfill, • Borrow pits, • Meteorological masts, • Crushing and screening plant, • Topsoil stockpiles, • Communication towers, • Site offices and workshops, and • Battery energy storage system(s) (BESS)		
Construction Elements		
Water infrastructure (storage infrastructure (such as turkey's nests) and pipelines to transport water from the existing production bores to the storage infrastructure).	Figure 3-2	Up to 850 megalitre (ML)/annum during construction period.
Backup Power Supply: • Diesel Generators, and • BESS.	Figure 3-2	Up to 4 megawatts (MW) (instantaneous load requirement).
Operational Elements		
Wind Energy Generation	Figure 3-2	Individual wind turbines generating renewable electricity
Transmission and Energy Storage (substations and associated battery energy storage systems (BESS)).	Figure 3-2	Up to six substations including BESS.
Water infrastructure (storage infrastructure such as turkey's nests) and pipelines to transport water from the existing production bores to the storage infrastructure).	Figure 3-2	Up to 100 ML/annum during operational period.
Backup Power Supply • Diesel Generators, • Thermal Generators, and • BESS.	Figure 3-2	Up to 4 MW (instantaneous load requirement).

Proposal Elements with Greenhouse Gas Emissions*	
Construction Elements	
Scope 1:	Scope 1 emissions for the construction and installation phase of the Proposal is estimated to be 75,000 tCO_2-e per annum
No Scope 2 emissions are anticipated from the Proposal in construction as all electrical power will be self-generated.	No Scope 2 emissions are anticipated from the Proposal in construction as all electrical power will be self-generated.
Scope 3:	Emissions during manufacturing and construction of facility and equipment are expected to be less than 40,000 tCO_2-e per annum.
Operational Elements	
Scope 1:	Scope 1 emissions during operations are expected to be approximately 325 tCO2-e per annum.
Scope 2:	No Scope 2 emissions are anticipated from the Proposal in operations as all electrical power will be self-generated.
Scope 3:	Scope 3 emissions during operations are expected to be approximately 40,000 tCO2-e per annum.
Total Emissions (based on annual average Scope 1 and Scope 2)	
Approximately 85,000 tCO_2-e	
Rehabilitation	
Topsoil to be stored in allocated storage areas and used to rehabilitate areas disturbed for temporary facilities following construction. At the completion of the Proposal, any infrastructure no longer required will be removed and disturbed areas rehabilitated consistent with the surrounding landscape. Topsoil from permanent clearing will be spread consistent with the surrounding landscape or stockpiled.	
Commissioning	
The commissioning of the wind farm will commence with the completion of the wind turbine generators and main substation connecting the Proposal to the main power transmission network. Groups of wind turbines connected to the substations via the 33 kV overhead lines will be commissioned as power from the grid becomes available. Before any operational activity begins, comprehensive system testing will be conducted on all turbines, electrical infrastructure, and grid connections to ensure that all components meet safety, performance, and environmental standards. Performance testing, and noise emission testing will be completed after commissioning if required.	
Decommissioning	
At completion of the operational phase, the decommissioning of the wind farm will involve the removal of all wind turbines, towers, foundations (to a specified depth), transformers, cabling, and other above-ground infrastructure. Underground components, such as cables or foundations below a certain depth, may be left in place if deemed environmentally preferable, in line with regulatory guidelines. All removed materials will be handled responsibly, with recyclable components sent to appropriate facilities and non-recyclable waste disposed of according to local regulations. Additional options for the Proposal may include re-purposing of the wind farm through third party agreements where the wind turbines and supporting infrastructure will remain in situ based on Post Closure Land Use discussions and negotiations with relevant stakeholders. Works will be planned to minimise environmental impact and restore the site to its pre-development condition as much as feasible.	

* The emissions estimates are based on a layout of up to 200 wind turbines. The Proposal has since been refined to 100 turbines. As a result, the emission numbers reported are overestimated.

Other elements which affect extent on the environment		
Proposal time	Maximum project life	25-30 years At the end of life, the site will either be repowered or decommissioned.
	Construction phase	Approximately 34 months.
	Operations phase	Operations across the proposed site will be achieved once commissioning of all stages is complete. Infrastructure to be maintained and then replaced or decommissioned at the end of asset life (approximately every 30 years).
	Decommissioning phase	Approximately 24 months.

Summary of Potential Impacts, Proposed Mitigation and Outcomes

Table ES-3: Summary of Potential Impacts, Proposed Mitigation and Outcomes

Flora and Vegetation	
EPA Objective	To protect flora and vegetation so that biological diversity and ecological integrity are maintained.
Policy and Guidance	• Technical Guidance – Flora and Vegetation Surveys for EIA (EPA, 2016a). • Environmental Factor Guideline – Flora and Vegetation (EPA, 2016b).

Potential Impacts	• Direct Impacts:
	  ○ Clearing of up to 910.25 ha of native vegetation,
	  ○ Clearing of up to 7.34 ha of riparian vegetation, which includes 3.13 ha of groundwater dependent vegetation and 4.20 ha of potentially groundwater dependent vegetation,
	  ○ Clearing of up to 76.65 ha of the 'Four plant assemblages of the Wona Land System' Priority Ecological Community (PEC), sub-community Cracking clays of the Chichester and Mungaroona Range (Priority 1),
	  ○ Clearing of up to 9.61 ha of vegetation type VfAI which is potentially the 'Four plant assemblages of the Wona Land System' PEC sub-community Cracking clays of the Chichester and Mungaroona Range (P1),
	  ○ Clearing of up to 82.47 ha of significant habitat for Priority flora species,
	  ○ Clearing of Priority flora species, including:
	  ▪ *Paspalidium retiglume* (Priority 2): one individual,
	  ▪ *Neptunia longipila* (Priority 3): 10 individuals,
	  ▪ *Dolichocarpa* sp. Hamersley Station (A.A. Mitchell PRP 1479) (P3): 23 individuals,
	  ▪ Euphorbia inappendiculata var. queenslandica (Priority 3): 72 individuals,
	  ▪ *Lotasperma sessilifolium* (Priority 3): one individual,
	  ▪ *Swainsona thompsoniana* (Priority 3): 18 individuals, and
	  ▪ *Ptilotus mollis* (Priority 4): 35 individuals.
	• Indirect Impacts:
	  ○ Fragmentation of conservation significant flora species habitat,
	  ○ Edge effects on seven conservation significant flora species, totalling 526 individuals from three Priority flora species:
	  ▪ *Paspalidium retiglume* (P2) – 101 individuals,
	  ▪ Euphorbia inappendiculata var. queenslandica (P3) – 180 individuals, and
	  ▪ *Ptilotus mollis* (P4) – 105 individuals,

	○ Edge effects on 'Four plant assemblages of the Wona Land System' PEC, sub-community Cracking clays of the Chichester and Mungaroona Range (Priority 1) and vegetation type VfAl which is potentially the 'Four plant assemblages of the Wona Land System' PEC sub-community Cracking clays of the Chichester and Mungaroona Range (Priority 1), ○ Reduced health of riparian vegetation or groundwater dependent vegetation through changes to hydrology and hydrogeology, ○ Introduction or spread of weed species, ○ Increased dust generation and deposition during construction, and ○ Increased risk of bushfire incidents as a result of hot works during construction, or during operations. • Cumulative impacts: ○ Combined impacts to the remaining extent of pre-European vegetation associations associated with the Proposal and other developments in the surrounding area, ○ Combined clearing of Priority flora species individuals reducing the extent of occurrence of the species or changing its conservation status at a regional or species level, ○ Combined impacts to groundwater dependent vegetation and potentially groundwater dependent vegetation resulting from direct clearing of vegetation associated with the Proposal and other developments in the surrounding area, and ○ Combined impacts to 'Four plant assemblages of the Wona Land System' PEC (Priority 1, Priority 3) resulting from direct clearing of vegetation associated with the Proposal and other developments in the surrounding area.
Mitigation	• Avoidance: ○ The Proposal has been substantially reduced to avoid impacts wherever possible. This has included significantly reducing the number of turbines from 200 to 100 and implementation of large areas of exclusion zones around important areas of vegetation and habitat throughout the DE. As such, the IDF for the Proposal is less than half that of the originally proposed design. ○ Avoidance of known locations of Sheet-flow dependent mulga vegetation and Threatened flora species, Pilbara Foxglove (*Quoya zonalis*), through design refinement of the DE, ○ Where conservation significant flora or vegetation occurs close to the IDF 'no-go' zones will be demarcated prior to construction activities to protect the conservation significant flora species and vegetation from impacts such as accidental clearing or disturbance, and ○ Areas to be cleared will be demarcated on the ground (either physically or using GPS enabled methods). • Minimisation: ○ All clearing areas will be checked and confirmed post-clearing through inspection of aerial imagery of clearing areas and comparison to the IDF. Site inspection will be undertaken prior to and following clearing to confirm no-go areas are appropriately demarcated. Disturbance will be managed using Fortescue's Land Use Certificate system, ○ Comprehensive weed hygiene management through implementation of weed management measures (Reference: 45-PL-EN-0033), ○ Groundwater abstraction for construction and operational water requirements is approved by Groundwater Licence (GWL)171278(7) and will be managed under the conditions of this GWL and the accompanying Groundwater Operating Strategy (GOS) (BC-16018-RP-HY-0001),

	○ Dust deposition will be managed through standard construction measures (e.g., water application and exposed surface stabilisation) to minimise dust generation and avoid impacts on vegetation in line with standard dust management measures, and ○ Implementation of fire risk management measures will be undertaken. • Rehabilitation: ○ Rehabilitation of a total of 480.81 ha (this includes 13.94 ha of areas previously cleared by other activities not related to this Proposal) which will be undertaken progressively after each phase of the construction activities to reduce impacts to flora and vegetation over time, including potential fragmentation.
Outcomes	**FV-1 Environmental Outcome:** Clearing no more than 910.26 ha of native vegetation (including 881.32 ha of 'Good to Excellent') within DE, of which no less than 480.81 ha will be rehabilitated. **FV-2 Environmental Outcome:** The implementation of the proposal will not result in the change of conservation status of identified conservation significant vegetation, including: • Direct disturbance of no more than 76.65 ha of 'Four plant assemblages of the Wona Land System' PEC (P1), • Direct disturbance of no more than 9.61 ha of potential 'Four plant assemblages of the Wona Land System' PEC (P1), • Direct disturbance of no more than 3.13 ha of groundwater dependent vegetation, • Direct disturbance of no more than 4.20 ha of potential groundwater dependent vegetation, • Direct disturbance of no more than 82.47 ha of habitat for significant Priority flora species, including: ○ 22.62 ha of Area 1 (VfAl), ○ No disturbance of Area 2 (VfAl) ○ 8.19 ha of Area 3 (VfAl), ○ 47.02 ha of Area 4 (ElAbTl), ○ 4.64 ha of Area 5 (ElGwTe), and ○ No disturbance of Area 6 (VfAl) **FV-3 Environmental Outcome:** No direct or indirect disturbance to the Threatened flora species Quoya zonalis. **FV-4 Environmental Outcome:** The implementation of the proposal will not result in the change of conservation status of identified conservation significant flora species, including: • No more than 0.4% of Paspalidium retiglume (P2) will be cleared, • No more than 5.3% of Neptunia longipila (P3) will be cleared, • No more than 3.1% of Dolichocarpa sp. Hamersley Station (A.A. Mitchell PRP 1479) (P3) will be cleared, • No more than 4.0% of Euphorbia inappendiculata var. queenslandica (P3) will be cleared, • No more than 20% of Iotasperma sessilifolium (P3) will be cleared,

	• No more than 2.0% of Swainsona thompsoniana (P3) will be cleared, • No more than 0.5% of Ptilotus mollis (P4) will be cleared, **FV-5 Environmental Objective:** Implementation of the Environmental Management Plan monitor and minimise impacts on flora or vegetation from dust, weed spread, or changes to natural fire patterns when compared with existing environmental conditions.
Terrestrial Fauna	
EPA Objective	To protect terrestrial fauna so that biological diversity and ecological integrity are maintained.
Policy and Guidance	• Technical Guidance – Terrestrial vertebrate fauna surveys for EIA (EPA, 2020). • Environmental Factor Guideline – Terrestrial Fauna (EPA, 2016c). • Guidelines for Determining the Likely Presence and Habitat Usage of Night Parrot (*Pezoporus occidentalis*) in Western Australia (DBCA, 2024f). • Guidelines for Surveys to Detect the Presence of Bilbies and Assess the Importance of Habitat in WA (DBCA, 2017). • Technical Guidance – Sampling of Short-Range Endemic (SRE) Invertebrate Fauna (EPA, 2016d).

Potential Impacts	• Direct impacts:
	  ○ Clearing of critical habitat, critical supporting habitat and/or supporting habitat for conservation significant fauna species,
	  ○ Clearing of SRE habitat,
	  ○ Bird and bat collision with operational wind farm infrastructure, and
	  ○ Increased risk of vehicle strike during construction, maintenance and operational activities.
	• Indirect impacts:
	  ○ Habitat fragmentation and proposal infrastructure acting as a barrier to fauna movement,
	  ○ Increasing access and attraction of scavenger and feral animals,
	  ○ Introduction and/or spread of weeds,
	  ○ Disrupted behaviour of nocturnal fauna due to artificial light,
	  ○ Disturbance from noise and vibration,
	  ○ Alteration or creation of microclimates, and
	  ○ Increased risk of bushfires.
	• Cumulative impacts:
	  ○ Combined impacts from clearing of general fauna habitats associated with the Proposal and other developments in the surrounding area,
	  ○ Combined impacts from clearing of habitat critical to the survival of Threatened Species associated with the Proposal and other developments in the surrounding area, and

	○ Combined disturbance to Threatened and Migratory Species from construction and operational activities associated with the Proposal and other developments in the surrounding area.
Mitigation	• Avoidance: ○ The Proposal has undergone substantial redesign, resulting in a major reduction in scale, including a decrease in turbine numbers from 200 to 100 and a reduction in the IDF area from approximately 2,044 ha to 944.07 ha. ○ Prior to conducting ground disturbing activities, ensure known locations of environmental sensitive areas (such as habitat critical to the survival of species) to be retained and protected from disturbance are identified on the ground by appropriate signage, fencing or flagging. No-go zones will be demarcated on Proposal drawings and physically on site prior to clearing activities. • Minimisation: ○ Clearing and ground disturbing activities limited to the defined clearing limits and boundaries described within the approval documentation. The extent of the approved clearing will be clearly communicated in documentation and site inductions. Pre-clearing photos to be documented and post clearing inspections to be undertaken, ○ All site operatives and personnel attending the site will undergo an induction regarding Threatened fauna, and direct and indirect impacts (e.g., risk of vehicle strike, interaction with construction activities, waste management and introduction of feral animals), ○ Strict speed limits will be enforced during dawn and dusk in order to avoid fauna strikes during clearing and construction (Chapter 8), ○ Consideration will be given to the use of line marking along the internal electrical reticulation to increase visibility to birds and bats, and improve their ability to accurately perceive depth in relation to power lines. Ultraviolet (UV) line marking, if available, should also be considered, particularly with a view to minimising risks of nocturnal collisions (Dwyer *et al.*, 2020). The design of both power lines and poles will comply with recommendations developed by BirdLife International (BirdLife International, 2007) to minimise potential for impacts to birds, ○ Comprehensive weed hygiene management through implementation of weed management measures. All works will be undertaken in accordance with Fortescue's Weed Management Plan (Reference: 45-PL-EN-0033) as the standard operating procedure, ○ Implementation of fire risk management measures will be undertaken, ○ All food waste will be regularly removed from site and disposed of at a licenced landfill facility to minimise attraction of feral animals, ○ Lighting will be designed and managed in accordance with the National Light Pollution Guidelines for Wildlife (DCCEEW, 2023c), ○ Standard construction noise management measures will be implemented, ○ Operational measures to reduce potential impacts associated with collision of the wind turbine (see Section 8.6 for further detail), and ○ A Bird and Bat Management Plan (BBMP) will also be developed for the Proposal to minimise impacts to birds and bats, including collision impacts. • Rehabilitation:

	○ Rehabilitation of 480.81 ha (this includes 13.94 ha of areas previously cleared by other activities not related to this Proposal) after each phase of the construction activities will reduce impacts to fauna habitat over time, including potential fragmentation impacts.
Outcomes	**TF-1 Environmental Outcome:** Disturbance of critical fauna habitat not to exceed: • Clearing of no more than 1.42 ha of habitat identified as being critical to the survival of the Grey Falcon, • Clearing of no more than 14.95 ha of habitat identified as being critical to the survival of the Northern Quoll, • Clearing of no more than 238.24 ha of habitat identified as being critical supporting to the survival of the Northern Quoll, • Clearing of no more than 27.82 ha of habitat identified as being critical to the survival of the Ghost Bat and PLNB, • Clearing of no more than 27.82 ha of critical habitat for the Pilbara Olive Python within the DE will occur, • Clearing of no more than 281.81 ha iof habitat identified as being critical to the survival of the Night Parrot, • Clearing of no more than 1.42 ha of potential Australian Painted Snipe and Common Greenshank dispersal and foraging habitat, and • Clearing of no more than 27.82 ha of habitat identified as being critical to the survival of the Peregrine Falcon. **TF-2 Environmental Outcome:** Avoidance of habitat suitable for conservation significant fauna. Fauna Habitat Exclusion Zones (FHEZ) have been proposed to minimise impacts on critical fauna habitats and to ensure no disturbance occurs within these areas, these areas include: • FHEZ of 5,894.74 ha of Rocky Escarpment habitat (including 1 km buffer), • FHEZ of 5,441.33 ha of Major Drainage Line/River/Creek habitat (including 500 km buffer, which allows for clearing but no turbines to be installed), and • FHEZ of 1,815.59 ha of Hills/Ranges/Plateaux (including 1 km buffer). **TF-3 Environmental Objective:** Implementation of the Bird and Bat Adaptive Management Plan (BBAMP) to monitor and minimise collision risk impacts to species.
Social Surroundings	
EPA Objective	To protect social surroundings from significant harm.
Policy and Guidance	• Statement of Environmental Principles, Factors and Objectives (EPA, 2023a). • Environmental Factor Guideline – Social Surroundings (EPA, 2023b). • Technical Guidance: EIA of Social Surroundings – Aboriginal Cultural Heritage (EPA, 2023c).
Potential Impacts	Aboriginal Cultural Heritage and Cultural Values: • Direct impacts: ○ Unauthorised disturbance/access to Heritage Places and objects within the DE, ○ Disturbance to Mesas landforms of cultural significance, ○ Potential impacts to culturally significant plants and animals (including Migratory birds),

	○ Disturbance to creek lines or banks from proposed crossings or widening of existing tracks over creeks, and ○ Loss of culturally significant pools, including Bonnie Pool. ○ Potential loss of access to Country to undertake traditional activities (such as hunting or camping). • Indirect impacts: ○ Decline of plant health for culturally significant flora in high-risk areas, ○ Reduced aesthetics from seeing the Wind turbines and dust generated from activities at culturally significant places used by Traditional Owners, and wider landscape, ○ Excessive dust and noise levels during construction and operations impacting ability to undertake traditional activities within the area and specific locations (including Bonnie Pool), ○ Noise and vibration from operating wind turbines resulting in altered animal behaviour (discussed further in Chapter 10: Terrestrial Fauna),and ○ Altered hydrological regime of rivers and creek lines impacting health of culturally significant waterways and natural characteristics. Non-Aboriginal Heritage: • Potential direct impacts from the Proposal on Non-Aboriginal heritage include damage or degradation of Bonney Downs Homestead and Log Cabin from construction and operation of the Proposal. Amenity: • The Proposal will result in permanent changes to the landscape due to the placement of man-made structures in an otherwise natural landscape, • An increase in noise levels compared to baseline during construction, • An increase in noise levels compared to baseline during wind farm operations, • Increased noise levels and human discomfort during construction activities, due to elevated noise levels and ground-borne vibration at Bonney Downs Homestead, • Increased noise levels and human discomfort during operations, due to elevated noise levels and ground-borne vibration at Bonney Downs Homestead, and • There are potential impacts in relation to the Proposal resulting from dust on Bonney Downs Homestead.
Mitigation	Aboriginal Cultural heritage and Cultural Values: • Avoidance: ○ Undertake heritage surveys and consultation to identify Heritage Places and areas of cultural significance, ○ Undertake relevant impact assessments/studies to assess potential impacts as designs plan change (where applicable), ○ All Heritage Places and Heritage Restriction Zones (HRZs) will be identified in Fortescue's GIS system, ○ IDF designed to avoid Heritage Places and areas of cultural significance (where practicable),

- Fencing of Heritage Places in proximity to proposed works (where required) or demarcation of LUC activity area in accordance with Fortescue's Heritage LUC Demarcation Procedure (100-GU-HE-0010),
- Culturally significant water sources, areas of culturally significant flora and fauna, and areas requiring access to undertake traditional activities are recorded in Fortescue's GIS system as Heritage Places or HRZs,
- IDF designed to avoid Bonnie Pool,
- Culturally significant plants or animals which require ongoing management to be included in environmental management plan,
- Implementation of mitigation measures outlined in Chapter 7 (Flora and Vegetation) and Chapter 8 (Terrestrial Fauna),
- Heritage Places or areas of cultural significance that are dust, noise, visual, or vibration sensitive will be recorded as such in Fortescue's GIS system,
- Access to Bonnie Pool, creeks, and tributaries is maintained, and
- Access to Nullagine Mine Haul Road and surrounding area is maintained.

- Minimisation
  - Relevant Heritage conditions applied to Land Use Certificates (LUCs) prior to undertaking works in the DE,
  - Undertake Heritage LUC Audits during construction phase and ground disturbing activities (as required),
  - All personnel mobilised to site to undertake general and site-specific inductions regarding Fortescue's heritage management procedures,
  - Undertake blasting activities in accordance with Fortescue's Blasting Near Heritage Place Procedure (100-PR-HE-0003),
  - Where required, seek heritage approvals under relevant heritage legislation in consultation with Palyku and Nyiyaparli,
  - Proposal designed to minimise impacts to creeks by reducing the number of creek crossings and utilising existing crossings where practical,
  - Where creek crossings are required to provide connectivity to the turbines within the DE, they are designed to:
    - Utilise existing access tracks where possible,
    - Minimise impacts to heritage sites,
    - Maintain flow continuity and prioritise using floodways where possible,
    - Reduce disturbance footprint in watercourses,
    - Minimise gradient of road entry and exit points at crossing locations
  - Pole locations located outside of high flow areas, where required to be installed within rivers, as far as possible,
  - Turbine locations to avoid major watercourses and associated 1% Annual Exceedance Probability (AEP) floodplain area,
  - Turbine hardstand areas and supporting infrastructure to be positioned outside of noted flood prone areas
  - Turbine access track designed to minimise crossings of major watercourses and flow paths,
  - Implementation of a construction surface water and sediment management plan throughout the construction phase,
  - Establish appropriate criteria/thresholds for managing areas of culturally significant plants or animals in high-risk areas, that might be identified (where existing management strategies or procedures may not apply),

	○ Clearing of land kept to a minimum to reduce potential loss of traditional flora species and culturally significant fauna habitat, ○ Implement general dust management protocols to minimise dust generated from Fortescue activities in accordance Fortescue Dust Management Plan/Procedure, ○ The Proposal has been designed to ensure turbines will not located on hills or mesas. ○ Ensure consultation with PJAC and KNAC regarding Decommissioning Plan (where required), ○ Notifications for road closures will be provided to PJAC and KNAC during construction or maintenance activities, and ○ Access protocol to be developed with Palyku Traditional Custodians for continued access to Bonnie Pool • Rehabilitation: ○ Rehabilitation of a total of 480.81 ha (this includes 13.94 ha of areas previously cleared by other activities not related to this Proposal) which will be undertaken progressively after each phase of the construction activities to reduce impacts to flora and vegetation over time, including potential fragmentation. This will be undertaken in accordance with Fortescue's standard procedures including Rehabilitation and Revegetation Monitoring Procedure (Reference: 45-GU-EN-0009). • Amenity: ○ Fortescue is committed to mitigating noise exceedances at the Bonney Downs Homestead through the implementation of appropriate mitigation measures including potential modifications to the IDF design, such as the removal of turbines near the homestead, and/or the operational adjustment of wind farm turbines to ensure noise levels remain within the prescribed thresholds during operation, ○ Use of dust suppression to manage dust generation from construction activities, access roads and cleared areas, ○ Use of water sprays to manage dust generation from material transport and stockpiling, ○ Complete relevant dust assessments/modelling to identify potential impacts to dust sensitive sites in high-risk areas, ○ Limit the number and height of stockpiles, and ○ Vehicles confined to designated routes with speed limits strictly enforced.
Outcomes	**SS-1 Environmental Outcome:** No unauthorised disturbance to Aboriginal cultural heritage sites in the development envelope, unless consent is granted to disturb that site under WA legislation which specifically relates to Aboriginal heritage and has required informed consultation with relevant Traditional Owners. **SS-2 Environmental objective:** The proponent must undertake ongoing consultation and engagement with relevant Traditional Owners about the achievement of the outcomes and objectives SS-1, FV-5 and TF-3 for the life of the proposal. The proponent must take reasonable steps to consult with relevant Traditional Owners when revising the following environmental management plans: (1) Bonney Downs Environmental Management Plan (2) Bonney Downs Bird and Bat Adaptive Management Plan **SS-3: Environmental outcome:** Subject to implementation of health and safety protocols, no interruption of ongoing access to land utilised for traditional use or custom by relevant traditional owners.

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ABBREVIATIONS

Abbreviation	Definition
ABN	Australian Business Number
ABS	Australian Bureau of Statistics
ACHIS	Aboriginal Cultural Heritage Inquiry System
AEP	Annual Exceedance Probability
AH Act	*Aboriginal Heritage Act 1972*
AHD	Australian Height Datum
ALA	Atlas of Living Australia
ANZG	Australian and New Zealand Guidelines
APLIC	Avian Power Line Interaction Committee
ARI	Assessed on Referral Information
ARU	Autonomous recording units
ASS	Acid Sulfate Soil
BAM Act	*Biosecurity Agriculture and Management Act 2007*
BBMP	Bird and Bat Management Plan
BBSUS	Bird and Bat Site Utilisation Survey
BC Act	*Biodiversity Conservation Act 2016*
BDS	Bonney Downs Stations
BESS	Battery Energy Storage Systems
BIF	Banded Iron Formation
BoM	Bureau of Meteorology
CAMBA	China-Australia Migratory Bird Agreement
CEMP	Construction Environmental Management Plan
CEO	Chief Executive Officer
CO_2	Carbon Dioxide
CO_2-e	Carbon Dioxide Equivalent
CoA	Commonwealth of Australia
COI	Cytochrome C oxidase subunit I
CPI	Consumer Price Index
CR	Critically Endangered
Critical habitat	Habitat critical to the survival of a species
DAWE	Department of Agriculture, Water and the Environment
DBCA	Department of Biodiversity Conservation and Attractions
DCCEEW	Department of Climate Change, Energy the Environment and Water
DE	Development Envelope
DEC	Department of Environment and Conservation
DEED	Department of Energy and Economic Diversification
DEMIRS	Department of Energy, Mines, Industry Regulation and Safety

Abbreviation	Definition
DER	Department of Environmental Regulation
Development Envelope	The maximum area within which the footprint for the Proposal will be located
DEWHA	Department of the Environment, Water, Heritage and the Arts
DMA	Decision Making Authority
DMPE	Department of Mines, Petroleum and Exploration
DoE	Department of Environment
DoW	Department of Water
DPaW	Department of Parks and Wildlife
DPIRD	Department of Primary Industries and Regional Development
DNA	Deoxyribonucleic acid
DPLH	Department of Planning, Lands, and Heritage
DWER	Department of Water and Environmental Regulation
DSEWPaC	Department of Sustainability, Environment, Water, Population and Communities
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EN	Endangered
EP Act	*Environmental Protection Act 1986*
EPA	Environmental Protection Authority
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
ERD	Environmental Review Document
ESA	Environmentally Sensitive Area
Fortescue	Fortescue Limited
GDE	Groundwater Dependent Ecosystem
GDV	Groundwater Dependent Vegetation
GED	Green Energy Division
GL	Giga litre
GNH	Great Northern Highway
GOS	Groundwater Operating Strategy
GoWA	Government of Western Australia
GW	Gigawatts
GWL	Groundwater Licence
ha	Hectare
HBI	Harry Butler Institute
HRZ	Heritage Restrictions Zone
HSC	Heritage sub-committee
IBRA	Interim Biogeographic Regionalisation for Australia
IDF	Indicative Disturbance Footprint – The indicative location where ground disturbance for the physical elements of the Proposal will occur. The extent of this footprint is used to

Abbreviation	Definition
	determine impacts. The spatial location of this footprint may vary as the design is refined.
IRR	Impact Reconciliation Report
IUCN	International Union for Conservation of Nature
JAMBA	Japan-Australia Migratory Bird Agreement
JTSI	Department of Jobs, Tourism, Science and Innovation
km	kilometres
KNAC	Karlka Nyiyaparli Aboriginal Corporation
kV	Kilovolt
LCU	Landscape Character Unit
L/s	Litres per second
m	metre
mbgl	Metres Below Ground Level
MDCP	Mining Development and Closure Proposal
Met Mast	Meteorological Mast
MI	Migratory
ML	Mega litre
mm	Millimetre
MNES	Matter of National Environmental Significance
MS	Ministerial Statement
MW	Megawatt
NESP	National Environmental Science Program
Noise Regulations	Environmental Protection (Noise) Regulations 1997
NSW	New South Wales
NT	Northern Territory
Nyiyaparli	The native title holders, knowledge holders, or representatives of the Nyiyaparli People
OS	Other Specially Protected
P	Priority
Palyku	The native title holders, knowledge holders, or representatives of the Palyku People
PEC	Priority Ecological Community
PEG	Pilbara Energy (Generation) Pty Ltd
PEOF	Pilbara Environmental Offsets Fund
PJAC	Palyku-Jartayi Aboriginal Corporation
PLNB	Pilbara Leaf-nosed Bat
POI	Points of Interest
PV	Photovoltaic
RIWI Act	*Rights in Water and Irrigation Act 1914*
RNTBC	Registered Native Title Body Corporate
ROKAMBA	Republic of Korea – Australia Migratory Bird Agreement

Abbreviation	Definition
RSA	Rotor Swept Area
SRE	Short-range Endemic
TEC	Threatened Ecological Community
TEK	Traditional Ecological Knowledge
TPFL	Threatened and Priority Flora Database
TSSC	Threatened Species Scientific Community
UV	Ultraviolet
VIA	Visual Impact Assessment
VMO	Visual Management Objective
VU	Vulnerable
WA	Western Australia
WAPC	Western Australian Planning Committee
WG	Working Group
WTG	Wind Turbine Generators

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1 INTRODUCTION

Pilbara Energy (Generation) Pty Ltd (PEG), a wholly owned subsidiary of Fortescue Limited (Fortescue), is proposing to develop the Bonney Downs Wind Farm, comprising a wind farm and associated supporting infrastructure (the Proposal). The Proposal is located approximately nine kilometres (km) southwest of Nullagine (at the northern extent of the Proposal) in the Pilbara region of Western Australia (WA) (Figure 1-1). The southern boundary of the Proposal is approximately six km from Fortescue's Christmas Creek Iron Ore Mine Expansion project (Ministerial Statement (MS) 1033 boundary).

The Proposal will involve the installation of up to 100 wind turbines and substations, with a target installed renewable energy capacity of approximately 2.1 GW. The actual power generation of the Proposal may differ to the target capacity, depending on the efficiency of the turbine equipment once installed and throughout the life of the Proposal. The Proposal includes a Development Envelope (DE) of 89,973.86 ha within which an Indicative Disturbance Footprint (IDF) of 944.07 ha is anticipated.

Separately to this Proposal, Fortescue is developing the Nullagine Pilot Wind Farm (the Pilot). The Pilot comprises up to 17 wind turbines, 50 km of 220 kV transmission line to Christmas Creek Mine and associated electrical connection works and has been progressed under separate State approvals (Clearing Permit CPS 11067/1 issued under Part V of the *Environmental Protection Act 1986* and Mining Development and Closure Plan REG ID 500678 approved under the *Mining Act 1978*). The Pilot is a stand-alone proof-of-concept project with independent purpose and utility. It will generate operational data and learning to inform future decision-making on larger developments, while also replacing the requirement for diesel powered generators at Christmas Creek mine.

For the avoidance of doubt, the Pilot is not a staged "first phase" or component of the Bonney Downs Wind Farm and is excluded from the Bonney Downs referral and associated Development Envelope for the purposes of this ERD. The Pilot is shown on figures in this ERD for context only and, where relevant in the body of the ERD, the Proposal assessment adopts a conservative approach to cumulative and facilitated impacts that includes the existence of the Pilot as existing environment. Notwithstanding this exclusion, Fortescue confirms that the Bonney Downs project may connect to the Pilot 220 kV transmission line at the Pilot's nominated grid connection point, subject to the commitments and safeguards described in this ERD.

The Proposal will also include temporary infrastructure such as fuel storage, construction laydown areas, site offices, and permanent supporting infrastructure such as, accommodation camps, operations support offices, communications towers, landfill facilities, and a series of access roads and corridors for overhead electrical reticulation.

Water infrastructure for the Proposal may be required, including turkey's nests, abstraction bores and pipelines. Fortescue has an existing 5C groundwater licence (GWL) to take water under the *Rights in Water and Irrigation Act 1914* (RIWI Act) (GWL171278(7)) that will be sufficient for the supply of water for construction and operation of the Proposal. The existing production bores will supply the Proposal's construction, operational (i.e., road and corridor maintenance) and potable water (with the use of water treatment) requirements.

The spacing and proposed design layout of the proposed wind turbines has been informed by an assessment of existing topography, environmental and heritage constraints, and the continued collection of wind and climate data by Fortescue, specific to the Proposal site. Site data has been used to undertake energy modelling for the wind farm, with wind turbines

positioned to optimise efficiency and power output. It should be noted that as the design and assessment process has progressed, Fortescue have implemented the mitigation hierarchy, and the Proposal has been substantially reduced to avoid impacts where possible. This has included significantly reducing the number of turbines from 200 to 100 and implementation of large areas of exclusion zones around critical fauna habitat throughout the DE. As such, the IDF for the Proposal is less than half that of the originally proposed design.

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Legend

- Development Envelope
- Indicative Disturbance Footprint
- Approved Disturbance (Nullagine Pilot Wind Farm)
- GOV Towns
- Major Roads
- Fortescue Rail
- BHP Rail
- Rio Tinto Rail
- Roy Hill Rail

Data Source(s):
Aerial, ESRI
All other data, Fortescue, 2025

N

0 20 40 60 80 100
Kilometers

Figure 1-1
Proposal Location

Requested By: R. Dorji
Drawn By: R. Kerr
Revised By: rykerr
Approved By:
Scale: 1:2,750,000
Coordinate System: GDA 1994 MGA Zone 50
Project Name: 4519OP002_MP_EN_0093_PartIV
Document Name: 4519OP002_MP_EN_0093_001_r1_ProjectLocation

Date: 1/28/2026
Size: A4L
Revision: 1
Confidentiality: 0

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1.1 Purpose and Scope

The purpose of this Environmental Review Document (ERD) is to present an Environmental Impact Assessment (EIA) of the Proposal to support the referral of the Proposal to the Environmental Protection Authority (EPA) under section 38 of the *Environmental Protection Act 1986* (EP Act). This ERD has been prepared in accordance with the EPA's '*Instructions on how to prepare an Environmental Review Document*' (EPA, 2024a) and is based on project and study information available at the time of writing.

1.2 Proponent Details

Pilbara Energy (Generation) Pty Ltd (PEG) is the Proponent of the Bonney Downs Wind Farm Proposal, as detailed in Table 1-1.

Table 1-1: Proponent Details

Proponent	**Pilbara Energy (Generation) Pty Ltd (PEG)**
Australian Business Number (ABN)	31 631 303 305
Registered Address	Ground Floor, 256 St Georges Terrace, Perth WA 6000
Proponent Representative	
Name	[redacted]
Position	[redacted]
Email	[redacted]
Proponent Contact	
Name	[redacted]
Position	[redacted]
Email	[redacted]

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2 LEGISLATIVE CONTEXT

2.1 Environmental Impact Assessment Process

2.1.1 *Environmental Protection Act 1986*

The EP Act is the key legislative tool for environmental protection in Western Australia (WA). The EP Act provides for the prevention, control and abatement of pollution and environmental harm; and for the conservation, preservation, protection, enhancement and management of the environment. The Proposal has been referred under Part IV, section 38 of the EP Act.

This document has been prepared in accordance with the Environmental Impact Assessment (Part IV Divisions 1 and 2) Administrative Procedures 2024 (Government Gazette No. 153), the Procedures Manual (EPA, 2024b) and the Instruction: How to Prepare an Environmental Review Document (EPA, 2024a) to provide sufficient information for the EPA to assess this Proposal at Referral Stage.

This ERD is a supporting document describing the specific studies and investigations conducted by Fortescue in relation to the preliminary key environmental factors and has been prepared to a standard consistent with that of similar Environmental Reviews for mining developments in WA.

2.1.2 Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)

If a Proposal is likely to have a significant impact on a Matter of National Environmental Significance (MNES) it requires approval from the Commonwealth under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The Proposal will be referred to the Commonwealth under the EPBC Act due to potential impacts on MNES.

If the action is determined to be a Controlled Action, the action may be assessed in accordance with section 87 of the EPBC Act. Fortescue will not seek an accredited assessment if the action is determined to be a Controlled Action.

2.2 Other Approvals and Regulation

The Proposal will be required to comply with the requirements of relevant State legislation and regulations as shown in Table 2-1.

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Table 2-1: Other Approvals and Regulations

Decision making authority	Legislation	Type of approval	Proposed Activity	Can process mitigate impacts on environment?
Department of Water and Environmental Regulation (DWER)	EP Act (Part V)	Works Approvals and Operating Licences	Construction and operation of prescribed activities and premises. The Proposal includes the construction and operation of a new landfill, concrete batching plant, wastewater treatment plant, on-site mobile crushing and screening plant, and other supporting infrastructure which may require approval from DWER of applications for works approvals/licences under Part V of the EP Act.	**Yes** Decision Making Authority (DMA) can mitigate potential impacts to Inland Waters, Flora and Vegetation, Terrestrial Fauna, Terrestrial Environmental Quality, Social Surroundings, Human Health and Air Quality. Works Approvals and Licences regulate emissions and discharges to air, land or water and apply to 'prescribed premises' categories defined in Schedule 1 of the Environmental Protection Regulations. Assessment of the Works Approval and subsequent Licence applications includes a risk assessment of the identified emissions and discharges and their potential to cause environmental harm. Applications are open for public comment, and the public and licence holder can appeal decisions. DWER will seek comments and advice from people and public authorities deemed to be interested during the assessment. Assessments consider the environmental risk, public health and amenity and the controls proposed to mitigate these risks. Compliance monitoring and reporting are included in standard conditions of approval.
	RIWI Act	5C and 26D Licences.	Groundwater abstraction for dewatering during construction and abstraction of construction water. Fortescue's existing licence (GWL171278(7)) will be used to abstract groundwater for the Proposal.	**Yes** DMA can mitigate impacts to Inland Waters. RIWI Act licences set limits on the location and quantity of water abstraction to ensure impacts to groundwater levels and quality are minimised. Relevant licences related to the Proposal include licence to: • Take water (a 5C groundwater or surface water licence), and • Construct wells, including bores and soaks (a 26D licence).

Decision making authority	Legislation	Type of approval	Proposed Activity	Can process mitigate impacts on environment?
				As part of the consenting process, impacts on the water environment will be considered and assessed. These licences are legal documents with terms, conditions and limits which must be complied with. Abstraction of groundwater at the project site is permitted under the conditions of 5C licence GWL171278(7) and associated Groundwater Operating Strategy (GOS) ref.BC-16018-RP-HY-0001. The GWL allows for abstraction of 1.009 Gigalitre (GL)/yr, whilst abstraction impacts must be monitored and managed in accordance with the GOS. The GOS contains trigger levels for groundwater bore levels and quality, as a mechanism to prevent or minimise the impacts of abstraction on environmental receptors and other groundwater users.
	RIWI Act Rights in Water and Irrigation Regulations 2000	Surface water permits (Bed and Banks Permit)	Construction of watercourse crossings and/or floodway which will disturb the banks of rivers and multiple creeks.	**Yes** DMA can mitigate some potential impacts to Inland Waters. Permit applications consider the effect of the alteration to existing surface water catchments, surface water flow paths and sheet flow Conditions will be set with respect to the disturbance of waterway beds and banks (including vegetation clearing and surface water management). As part of the consenting process, impacts on the water environment will be considered and assessed.
Department of Planning, Lands, and Heritage (DPLH)	*Aboriginal Heritage Act 1972* (AH Act)	Section 18 Ministerial Consent	Potential disturbance of Aboriginal heritage sites.	**Yes** DMA can mitigate potential direct impacts to Aboriginal heritage sites. The assessment of direct impacts to heritage values will be completed under the AH Act. Fortescue is committed to minimising impacts on Heritage Places in all of its project areas which includes wherever possible avoidance of impacts on Heritage Places. Where the Proposal cannot avoid impact to Heritage Places or potential Heritage Places, Fortescue will consult with Palyku and

Decision making authority	Legislation	Type of approval	Proposed Activity	Can process mitigate impacts on environment?
				Nyiyaparli and apply for relevant approvals under the AH Act. Fortescue will comply with the AH Act and any approval conditions set by the Minister for Aboriginal Affairs at all times during construction and operation of the Proposal. Prior to submitting a Section 18 notice (if required), consultation with the Palyku-Jartayi Aboriginal Corporation and Karlka Nyiyaparli Aboriginal Corporation is required on: • The location, importance and significance of any Aboriginal heritage being impacted, • Management of any Aboriginal heritage being impacted, and • Comments on the Section 18 application (if required), including any objection, support and/or any suggested conditions and mitigation strategies. This consultation process is required by the Minister and Aboriginal Cultural Heritage Committee when evaluating the s18 submission.
Department of Biodiversity Conservation and Attractions (DBCA)	*Biodiversity Conservation Act 2016* (BC Act)	s40 Ministerial Authorisation	Clearing or disturbance of Threatened flora or fauna species.	**Yes** DMA can mitigate potential impacts to Flora and Vegetation and Terrestrial Fauna. The authority to issue a licence to take (flora and fauna) is assessed to determine whether the impact to the species or community will result in a significant impact. Applications for a section 40 authorisation that are associated with a wildlife licence type as defined in Part 4 of the Biodiversity Conservation Regulations 2018 will be considered against the requirements outlined in regulation 76. All applications will be considered in the context of the object of the BC Act in section 3(1)(a) to conserve and protect biodiversity and biodiversity components in the State. The BC Act provides the ability to impose conditions on authorisations to take Threatened species that mitigate or offset the impact of such action, as provided for in section 41 of

Decision making authority	Legislation	Type of approval	Proposed Activity	Can process mitigate impacts on environment?
				the BC Act of the relevant species in the state and on relevant habitat.
Department of Health DWER	*Health (Treatment of Sewage and Disposal of Effluent and Liquid Waste) Regulations 1974* EP Act	Health approvals	Operation of wastewater treatment facilities at construction and operation camps.	**Yes** DMA can mitigate potential impacts to Flora and Vegetation and Terrestrial Fauna. Sets conditions with respect to the construction and operation of wastewater treatment facilities to maintain human health standards and minimise impacts to the environment, including effluent quarter quality requirements and conditions in relation to reuse or irrigation of treated effluent. This minimises potential environmental risks or impacts from this activity.
Department of Mines, Petroleum and Exploration (DMPE) (formerly Department of Energy, Mines, Industry Regulation and Safety (DEMIRS))	*Mining Act 1978*	Mining proposal approval	Development on a tenement granted under the *Mining Act 1978*.	**Yes** DMA can mitigate some potential impacts to Inland Waters, Flora and Vegetation, Terrestrial Fauna and Terrestrial Environmental Quality on tenements granted under the *Mining Act 1978*. Mining Proposals address all Proposal elements and activities and consider the likely environmental impacts within an 'Environmental Group Site' (a grouping of mining tenements that make up a mining operation). DMPE aims to assess factors not regulated elsewhere (e.g., key environmental factors assessed under Part IV of the EP Act). The mining proposal must include an environmental risk assessment, site-specific environmental outcomes and a description of the management system that will be implemented to appropriately manage all environmental risks. Approval of a Mining Proposal will usually include environmental monitoring and reporting requirements. For example, the Nullagine Pilot Wind Farm has been granted approval through a Mining Development and Closure Plan (REG ID 500678) approved under the *Mining Act 1978*, which conditions implementation of a specific Bird and Bat Adaptive Management Plan (BBAMP) to mitigate and monitor potential collision impacts with avifauna.

Decision making authority	Legislation	Type of approval	Proposed Activity	Can process mitigate impacts on environment?
	EP Act - DMPE has delegated authority to administer the native vegetation clearing provisions for activities regulated under the *Mining Act 1978*	Native Vegetation Clearing Permit	Impacts associated with the clearing of native vegetation can be regulated under the EP Act Framework (Part V Division 2), however is administered by DMPE for activities regulated under the *Mining Act 1978*.	**Yes** Clearing of native vegetation in Western Australia is predominantly regulated under the EP Act. An authorisation under Part V of the EP Act is required to clear Native Vegetation, however, is administered by DMPE for activities regulated under the *Mining Act 1978*, with specific rules for mining leases, often requiring a Purpose Permit or Area Permit depending on land tenure. As part of the NVCP application, the Proposal will be assessed against the clearing principles, which prioritise avoiding clearing, then minimising impacts, and finally reducing residual environmental harm through actions like vegetation offsets. DMPE assesses applications against these ten principles, which cover impacts on high-value biodiversity, significant habitats, rare and threatened species, remnant vegetation, waterways, soil, and neighbouring conservation areas. For example, the Nullagine Pilot Wind Farm has been progressed under separate State approvals (Clearing Permit CPS 11067/1) issued under *Part V of the Environmental Protection Act 1986* which limits the amount of clearing to approved areas and conditions specific mitigation measures to minimise potential impacts on flora, vegetation and fauna.
	Dangerous Goods Safety Act 2004	Security sensitive ammonium nitrate storage licence Dangerous goods storage licence	Ammonium nitrate facility.	**Yes** DMA can mitigate some potential impacts to Inland Waters and Terrestrial Environmental Quality. Dangerous goods licence applications require completion of a risk assessment demonstrating the dangerous goods site can be operated with minimal risk to people, property and the environment. A licence to safely store ammonium nitrate as if it were an explosive.
		Dangerous goods storage licence	Fuel storage.	**Yes** DMA can mitigate some potential impacts to Inland Waters and Terrestrial Environmental Quality.

Decision making authority	Legislation	Type of approval	Proposed Activity	Can process mitigate impacts on environment?
				Dangerous goods licence applications require completion of a risk assessment demonstrating the dangerous goods site can be operated with minimal risk to people, property and the environment. Bulk fuel storage for the Proposal is estimated to be 110,000 litres, which exceeds the licensing threshold of 100,000 litres for combustible liquids.

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3 THE PROPOSAL

3.1 Justification

The proposed installed capacity has been determined to be sufficient to ensure a robust and dependable power supply for Fortescue's mining operations. Effective oversight of both the generation and transmission networks will be critical in harmonising renewable energy production with operational demand and ensuring overall power system stability.

Investing in wind farms and other renewable energy sources is a strategic move that significantly contributes to Fortescue's ambition of reducing carbon emissions and advancing towards its 2030 'real-zero' carbon goal. This objective is centred on the complete elimination of Scope 1 and 2 emissions by phasing out fossil fuels from Fortescue's Australian iron ore operations.

In Financial Year 2023, Fortescue's operations, including Australian iron ore and marine vessels, emitted a total of 2.55 million tonnes of carbon dioxide equivalent (CO_2-e). This included 2.2 million tonnes CO_2-e from Scope 1 sources, primarily from diesel-heavy mobile equipment, haul trucks, and stationary power, and 0.35 million tonnes CO_2-e from Scope 2 sources, which are associated with power purchases. Addressing these emissions through the proposed renewable energy initiatives is not only a crucial step towards meeting Fortescue's sustainability targets but also demonstrates commitment to minimising environmental footprint and leading the industry in climate action.

This approach is essential for meeting the targets set out in the United Nations Framework Convention on Climate Change Paris Agreement and the 2021 Glasgow Climate Pact. The Proposal also aligns with the Commonwealth and State Governments' commitments to reduce greenhouse gas emissions and reach renewable energy targets.

3.1.1 Benefits of the Proposal

One of the benefits of the Proposal includes a reduction in emissions and progress toward decarbonisation. By replacing diesel and gas-fired stationary power with renewable sources, the Proposal is projected to cut emissions by at least 1.5 million tonnes CO_2-e annually. This represents a significant step toward Fortescue's goal of achieving 'real-zero' carbon emissions by 2030.

The Proposal will also reduce fossil fuel dependency. The proposed 2.1 GW of renewable energy capacity will provide a new power source for Fortescue's operations in the Pilbara, ensuring a consistent energy supply critical for continuous mining operations.

Investing in renewable energy can lead to significant long-term cost savings by reducing reliance on expensive and volatile fossil fuels. Further, transitioning to renewable energy can enhance operational efficiency by modernising power infrastructure and integrating advanced technologies, which can improve overall performance and reduce maintenance needs.

The Proposal will have a positive environmental impact, reducing the reliance on fossil fuels which lowers environmental pollution and mitigates climate change impacts, contributing to broader ecological benefits and helping to preserve natural resources.

The Proposal will be developed to maximise power generation through innovative selection of wind turbine equipment, focusing on turbines that are designed to be the most efficient at the

wind speeds measured on site, whilst also designed to minimise wake losses and systematic losses.

Lastly, through the 'real zero' carbon goal, Fortescue is setting a precedent and leading the mining industry by demonstrating a commitment to sustainability and potentially influencing other companies to adopt similar practices.

3.1.2 Options and Alternatives Considered

Renewable energy projects are critical for the decarbonisation of mining operations, and therefore alternatives for this Proposal were restricted to location options and the type of renewable project. The footprint of the Proposal was reduced by the selection of a wind renewable project instead of solar photovoltaic (PV) infill and batteries, as wind allows for 24-hour generation and has a smaller footprint, therefore resulting in less clearing of native vegetation.

The location of a Proposal such as this is constrained by the following factors:

- Wind speeds must be high and consistent,
- Low vegetation cover is preferred,
- A remote location with a large area,
- Proximity to existing operations and grid, and
- Road access suitable for construction and ongoing maintenance is required.

3.1.2.1 Alternative Power Generation Project

Fortescue has previously considered alternative power supply sources. The greenhouse gas emissions associated with these alternatives are at odds with the Paris Agreement, which aims to limit global warming to well below 2°C above pre-industrial levels. The alternatives were also inconsistent with the EPA's Greenhouse Gas Guidance (EPA, 2023d). Alternative power options to the Proposal include:

- Purchase of power from existing third-party power generation infrastructure, which is dominated by power stations with high greenhouse gas emissions,
- Continuous operation of the Solomon Gas-fired Power Station at full capacity, as well as commissioning of additional thermal generation to cover Fortescue's increased load, and
- Net and Real zero options include conversion of Solomon Power Station to run on green ammonia/hydrogen, however covering all energy that would be provided by a wind generation site is not economically viable due to the high cost of green ammonia as a fuel.

In addition, use of alternative renewable sources was considered in the form of solar PV infill in and around mining operations, however as discussed, this option was constrained by requiring a larger footprint and having reduced operating hours.

3.1.2.2 No Development Option

The 'No Development Option' would mean continuing with the existing power sources for Fortescue's mining operations in the region. Without advancing the Proposal, the anticipated benefits of switching to renewable energy would be lost, leading to ongoing carbon emissions, or an increase in carbon emission where additional power is required to support current operations and growth, and exacerbating global and local climate change through mining operations.

The Proposal forms part of Fortescue's Pilbara Energy Connect project, which represents a crucial step in addressing this issue and furthering Fortescue's decarbonisation goals by expanding the main power transmission infrastructure to create an integrated transmission network that will allow renewable electricity generated at any of Fortescue's sites to be shared across operations.

Under a 'no development' scenario, Fortescue's current and future operations would rely on current power sources, specifically on-site diesel and/or gas power stations, for the entire lifespan of the mines. This reliance would significantly impede Fortescue's efforts to achieve carbon neutrality across its operations by 2030, in line with the Paris Agreement's aim to limit global warming to well below 2°C compared to pre-industrial levels.

3.1.2.3 Proposal Site Selection

An analysis of publicly available wind data in the Pilbara was cross referenced with terrain profiles to identify areas which have the potential to support an economically viable wind farm. These potential areas were then further filtered by distance to Fortescue's existing infrastructure, tenure status, cyclone regions and identified social, heritage and environmental considerations. As a result, four potential site options were selected for further analysis. Due to commercial sensitivities, further detail cannot be provided.

Remote sensing devices were placed on each site to measure wind speed. A further site comparison process was conducted in March 2023 to identify which of the wind sites under consideration offered the lowest levelized cost of energy and to consider the schedule associated with each location. To achieve this, concept designs were produced for each site, the respective costs estimated, and the generation profiles calculated. These evaluations were used as inputs to a demand response model to determine the maximum renewable penetration for a set of given scenarios based on a predicted operational load.

The Proposal location was chosen as the preferred area for reasons including the following:

- It maintains the most favourable wind resource of the sites assessed which will assist in achieving Fortescue's decarbonisation targets and minimise the infrastructure required to be constructed. Fortescue commissioned a 148 metre (m) Meteorological Mast (Met Mast) onsite in October 2023 and this unit, combined with a ground monitoring unit onsite, has verified the DE is acceptable for wind power generation of the magnitude required,

- Relative proximity to Fortescue's existing mining operations, compared to other options,

- Lower cyclone risk compared to other locations as it is located further from the coast,

- The underlying land is of lower environmental value in comparison to other sites, due to native vegetation impacted by pastoral activities,
- Relatively flat terrain compared to other options which reduces construction costs, and
- Favourable transport and logistic options.

3.2 Proposal Description

3.2.1 Summary and Key Elements

The Proposal is for the construction and operation of a renewable energy wind generation hub, to power the Fortescue mining operations in the Pilbara region. The key elements of the Proposal are summarised in Table 3-1 and provided in the proposal content document (see Overview of the Proposal).

The total expected area of vegetation to be cleared for the Proposal is 944.07 ha (33.81 ha within the DE is previously cleared). Following completion of construction, 480.81 ha (this includes 13.94 ha of areas previously cleared by other activities not related to this Proposal) will be rehabilitated, resulting in 443.39 ha of permanent clearing of native vegetation.

Table 3-1: Key Elements of the Proposal

Key elements	Proposed extent
Renewable infrastructure	Indicative Disturbance Footprint up to 944.07 ha Clearing of native vegetation up to 910.26 ha, including: • 443.39 ha of permanent clearing, and • 466.86 ha of temporary clearing.
Supporting electrical infrastructure	
Supporting infrastructure	
Water infrastructure	Construction water demand is ~850 ML/annum. Operational water demand is ~100 ML/annum (includes potable water use for the accommodation facilities and maintenance activities). Water for construction and operation of the Proposal will be abstracted under existing GWL171278(7).
Operation & maintenance	The operation phase of the Proposal is expected to commence in 2028 and will operate 24 hours per day.
Decommissioning & rehabilitation	Has an expected operational life of 25-30 years (with asset life extension, can operate indefinitely).

The Proposal will consist of the following elements, discussed in further detail below:

- Renewable energy generation infrastructure consisting of up to 100 wind turbines,
- Supporting electrical infrastructure consisting of:
  - 33 kV reticulation systems and collector substations,
  - Up to six 220/33 kV substations, and
  - Battery energy storage systems (BESS).

- Supporting infrastructure consisting of:
    - Corridors for overhead electrical reticulation,
    - Access tracks and internal roads,
    - Accommodation and associated wastewater treatment plant,
    - Hydrocarbon and chemical storage,
    - Landfill facilities,
    - Communication towers and in-ground fibre optic cabling,
    - Meteorological monitoring masts,
    - Laydown areas,
    - Site offices,
    - Borrow pits and on-site mobile crushing and screening plant,
    - Concrete batching facilities,
    - Ammonium nitrate facility,
    - Diesel electricity generation infrastructure, and
    - Topsoil stockpiles.

Separately to this Proposal, Fortescue is developing the Nullagine Pilot Wind Farm (the Pilot). The Pilot comprises up to 17 wind turbines and associated electrical connection works and has been progressed under separate State approvals (Clearing Permit CPS 11067/1 issued under Part V of the Environmental Protection Act 1986 and Mining Development and Closure Plan REG ID 500678 approved under the Mining Act 1978). The Pilot is a stand-alone proof-of-concept project with independent purpose and utility: it will generate operational data and learning to inform future decision-making on larger developments.

3.2.2 Renewable Energy Generation Infrastructure

The Proposal will involve the installation and operation of up to 100 wind turbines to harness wind energy for power generation.

It is anticipated that up to 2 ha of temporary clearing will be required to facilitate construction of each turbine. This temporary clearing is required as construction for each turbine, being up to 290m in height (to the tip of blade), requires access for cranes in order to hoist the turbine blades, nacelles, and towers.

Depending on the geotechnical characteristics of each turbine location, different foundation types will be utilised. These may include:

- A Nabrawind Self Erecting Tower (Nabralift) design may be utilised for the wind turbines. Nabralift contains a three-column framed structure installed under the

uppermost part of the tubular tower (an indicative Nabralift Tower is shown in Plate 3-1 and Plate 3-2). This option requires significantly less concrete than a traditional monopole,

- Mass gravity foundations requiring approximately 25 m diameter foundations that are approximately 4 m deep. These foundations are expected to have the largest volume of concrete required, consisting of approximately 1,100 m^3 of concrete and requiring reinforcement and an anchor cage,

- Rock anchor foundations which require significantly less concrete. However, they require drilling to depths of up to 35 m. Approximately 25 bore holes with a diameter of 200 mm may be required for each of these foundations, and

- Piled foundations which will also require significantly less concrete than mass gravity foundations. However, they also require drilling to depths of up to 35 m. Approximately 12 bore holes, with a diameter of 1200 mm may be required for each of these foundations.

Earthing grids for each turbine will be installed in parallel to the foundation. Excess excavated material will be appropriately stored and used as fill where suitable or spread locally to tie into the existing landscape, within the IDF area.

During operations, turbines will have a permanent footprint of up to 1 ha per turbine. Turbines will be arranged in rows that are spaced and orientated to maximise power generation. An IDF is provided in Table 3-1 and Figure 3-1. The final wind farm design will be completed following studies of environmental and heritage constraints. It is anticipated that there will be sufficient flexibility within the wind farm design to enable micro-siting to avoid environmental or heritage constraints additional to those identified in this ERD.

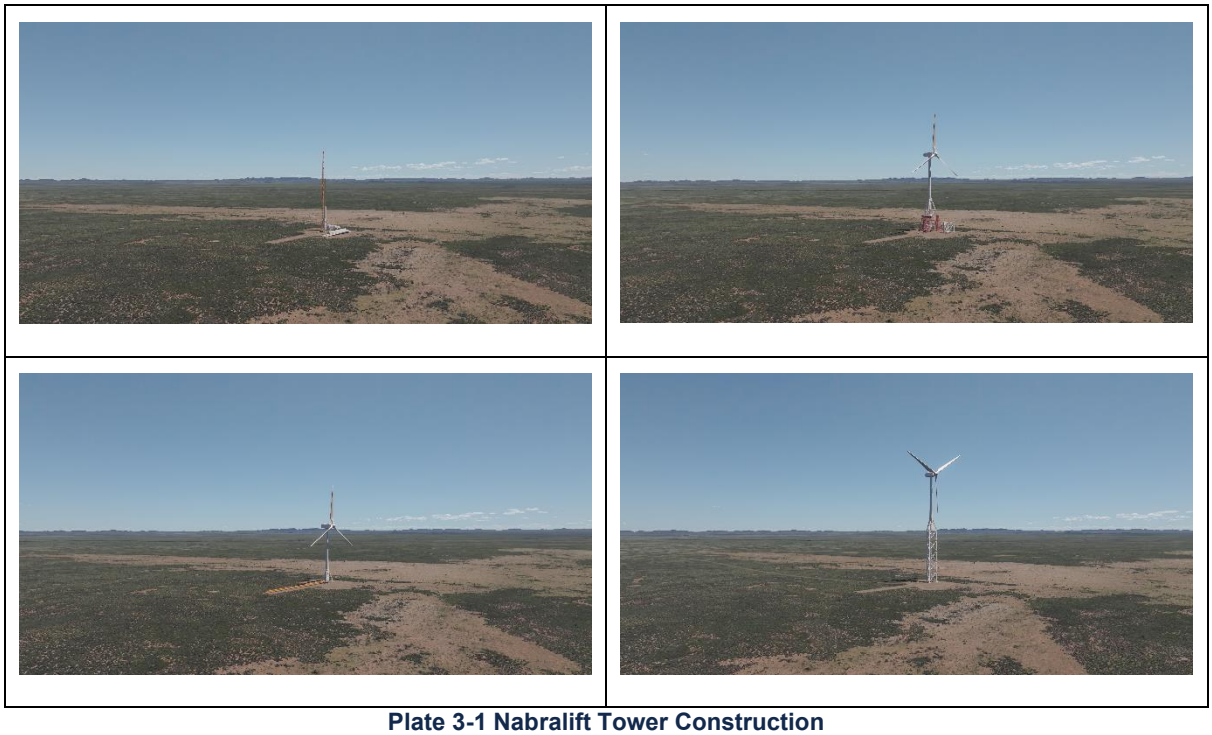

Plate 3-1 Nabralift Tower Construction

Plate 3-2 Nabralift Tower

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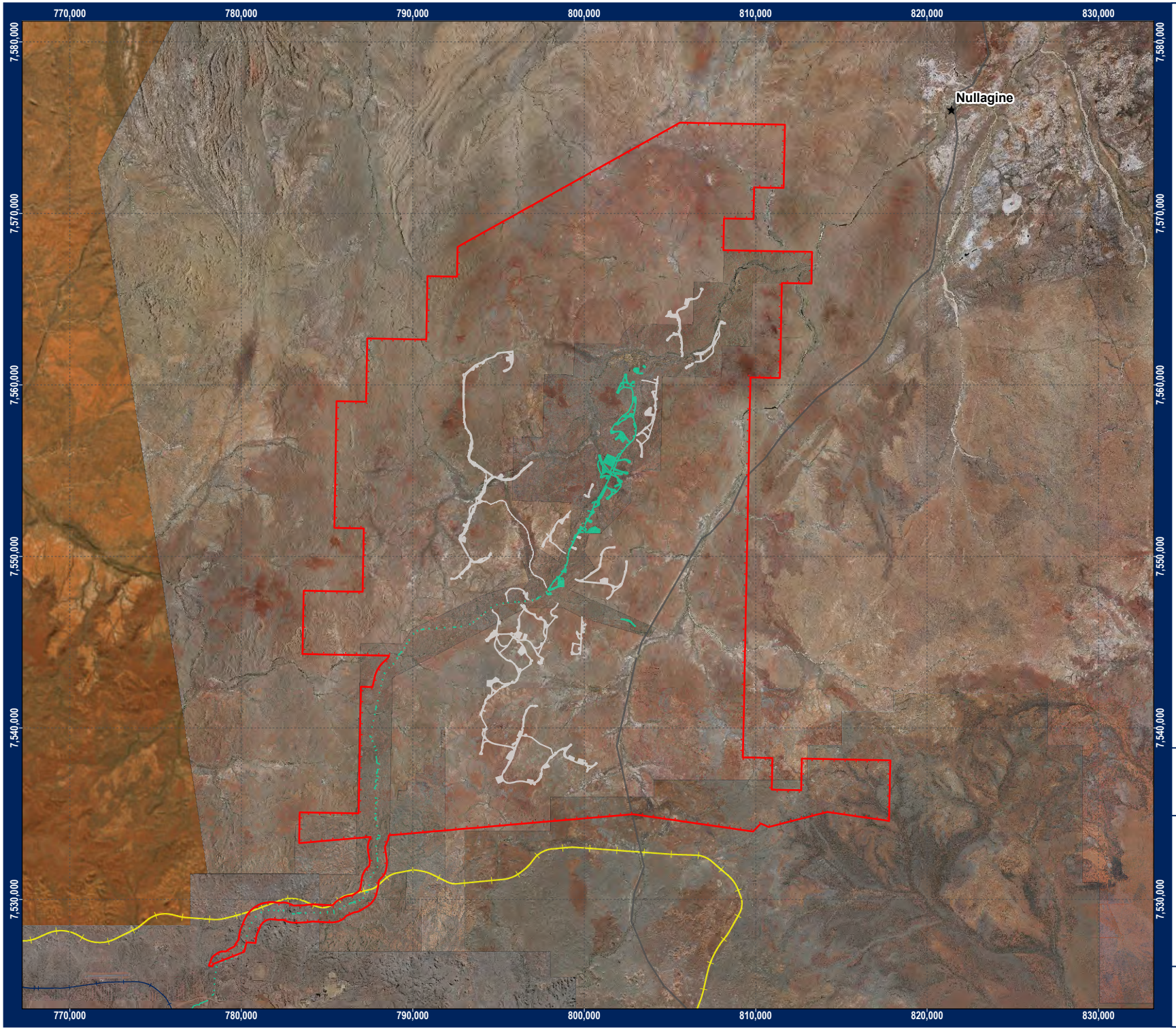

Legend

- Development Envelope
- Indicative Disturbance Footprint
- Approved Disturbance (Nullagine Pilot Wind Farm)
- GOV Towns
- Major Roads
- Fortescue Rail
- Roy Hill Rail

Data Source(s):
Aerial, Fortescue and ESRI
All other data, Fortescue, 2025

N

0 2 4 6 8 10
Kilometers

Figure 3-1
Indicative Disturbance Footprint

Requested By: R. Dorji
Drawn By: R. Kerr
Revised By: rykerr
Approved By:
Scale: 1:300,000
Coordinate System: GDA 1994 MGA Zone 50
Project Name: 4519OP002_MP_EN_0093_PartIV
Document Name: 4519OP002_MP_EN_0093_002_r1_IDF

Date: 1/28/2026
Size: A4L
Revision: 1
Confidentiality: 0

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3.2.3 Supporting Electrical Infrastructure

Supporting electrical infrastructure for the Proposal will include infrastructure for distribution and control, and energy storage.

3.2.3.1 Distribution and Control Associated with Wind Turbines

Each wind turbine will have associated infrastructure to support the safe transmission of energy from the turbine via overhead electrical reticulation and substations to Fortescue Integrated Power Network. Onsite energy storage will be located near substations along the network.

All wind turbines will be connected via 33 kV reticulation systems to collector substations, so that electrical power generated by the wind turbines can be collected. The 33 kV reticulation consists mainly of overhead lines with short sections of underground cables at each end of the lines to the wind turbine electrical kiosk.

The typical height of the 33 kV electrical reticulation that Fortescue currently employs across operations is 30 m. It incorporates steel poles with an average span length of 200 m (between the poles). An approximate 6 m wide access track may be cleared for the construction and maintenance of the overhead line where tracks do not already exist.

Each electrical reticulation pole will require a 20 x 20 m pad. The 33 kV overhead lines also require clearing of a 20 m-wide easement corridor, with the centre of the overhead line aligned with the centre line of the corridor.

3.2.3.2 Connection to Fortescue's Power Network and Energy Storage

Fortescue is currently developing the Nullagine Pilot Wind Farm, consisting of 17 turbines and approximately 50 km 220 kV transmission line to Christmas Creek Mine. The Pilot is a stand-alone proof-of-concept project with independent purpose and utility, generating operational data and learnings to inform future decision-making on larger developments.

The wind farm will be connected via up to six 220/33 kV substations located within the DE, to the 220 kV transmission line constructed as part of the Nullagine Pilot Wind Farm. All 220/33 kV collector substations at the wind farm are proposed to be interconnected in a ring configuration.

The substations require a 120 x 120 m pad. An additional temporarily cleared area of approximately 50 x 100 m is required for construction of each pad, which will be rehabilitated once construction is completed.

All substations will be fenced and are proposed to be equipped with gas-insulated 220 kV switchgear, which allows the substation footprint to be smaller compared to air-insulated technology. The internal transmission corridors will include an access track for maintenance and will be located to maintain clearance from other infrastructure, to minimise interruption of the prevailing wind.

BESS are proposed to be located at substations for the storage of energy to help balance load requirements throughout the transmission network.

3.2.4 Water Infrastructure

Fortescue has an existing 5C licence to take water (GWL171278(7)) that will be sufficient for the supply of water for construction and operation of the Proposal. The existing production bores will supply the Proposal's construction, operational (i.e., road and corridor maintenance) and potable water (with the use of water treatment) requirements. Water demand will be greatest during construction largely associated with construction of concrete foundations for the wind turbines and buildings, and construction of access tracks, while operational requirements will be significantly less and will vary throughout the life of the Proposal dependent on the operational/maintenance activities.

Construction water demand is expected to be approximately 850 megalitre (ML)/annum. Operational water demand is approximately 100 ML/annum which includes potable water use for the accommodation facilities and maintenance activities associated with the Proposal infrastructure. Accommodation facilities are discussed further in Section 3.2.5.2.

Water infrastructure for the Proposal is likely to consist of storage infrastructure (such as turkey's nests) and pipelines to transport water from the existing production bores to the storage infrastructure. Water infrastructure will be accommodated within the proposed IDF.

3.2.5 Supporting Infrastructure

Further to the above, additional supporting infrastructure and facilities will be required for the Proposal as discussed in Paragraphs 3.2.5.1 to 3.2.5.12 and shown on Figure 3-2.

3.2.5.1 Access and Internal Roads

The main access to the Proposal is via Great Northern Highway (GNH) or Fortescue's Rail Maintenance Track (which runs parallel to the GNH), and the Shire of East Pilbara road network (including Hillside Woodstock Road, Marble-Bar Woodstock Road, Hillside-Marble Bar Road and Bonney Downs-Hillside Road), which will enable transport of turbines and other infrastructure to the Proposal from port facilities at Port Hedland. There are additional existing roads and access tracks that will allow for Proposal traffic and delivery Proposal components and materials. Marble Bar Road will also be used for transportation of machinery and materials to the Proposal.

An internal network of site access tracks will connect the infrastructure during construction and operational activities, which will connect to the public road network at a suitable location. Existing cleared roads and tracks will be used where possible.

New internal access tracks will be unsealed. The layout of the access roads will minimise the overall track length required to provide access to all turbines, while also balancing cut to fill quantities. Access tracks within the DE have been designed to avoid areas subject to flooding where practical. However, where crossings are required, surface water infrastructure (floodways and culverts) will be used to ensure flow volume and velocity is not unreasonably impeded.

Typically, access tracks required for construction may be approximately 20 m wide and suitable for two-way traffic, including allowances for batters, shoulders and drains. During operation, this width will be reduced to 6-10 m with the remainder rehabilitated. An example of access roads to the wind turbines is shown in Plate 3-3.

Plate 3-3 Access roads to the wind turbines

3.2.5.2 Accommodation

The Proposal will require an accommodation camp to house workers during construction and operations. During construction, the camp will have capacity for up to 1,000 personnel, which will reduce to an operational workforce capacity of up to 100 personnel. Areas cleared for the construction camp will be utilised for the operations camp. Where areas are not required for operations, they will be rehabilitated once construction activities are complete.

Wastewater will be processed through a wastewater treatment plant. The plant will produce effluent suitable for land irrigation and discharged through a spray field or reused for dust suppression purposes. This wastewater treatment plant will be subject to a Works Approval and Operating Licence under Part V of the EP Act.

The Proposal will utilise existing infrastructure and coexist with existing users of infrastructure wherever possible.

3.2.5.3 Hydrocarbon and Chemical Storage

Fuel storage and refuelling areas will be required for servicing construction vehicles, and maintenance vehicles during operations. Fuel for light vehicles and mobile plant will be stored on site.

All fuel will be stored in bunded facilities in a manner that complies with relevant environmental, health and safety regulations including the *Dangerous Goods Safety Act 2004*, Dangerous Goods Safety (Storage and Handling of Non-explosives) Regulations 2007, and Australian Standard AS1940-2004: The storage and handling of flammable and combustible liquids (AS1940). Consideration will be given to alternative fuel sources for on-site vehicles over time in line with Fortescue's decarbonisation strategy and commitments.

3.2.5.4 Waste Management

Waste management for the Proposal will seek to minimise the generation of waste and the disposal of waste to landfill, which may include making use of regional recycling facilities. An on-site landfill facility will be required for disposal of solid waste that cannot be otherwise appropriately managed. Although the location of the landfill facility has not been determined at this stage of the design process, the expected clearing requirements have been accounted for within the IDF, and no additional clearing is anticipated to be required.

As discussed in Section 3.2.5.2, a wastewater treatment plant will also be constructed to treat wastewater associated with the accommodation camp, which has been accounted for within the IDF.

3.2.5.5 Communications

Communication towers supporting radio, telephone and internet will be installed to support operational requirements. In-ground fibre optic cabling will also be installed within the IDF area.

3.2.5.6 Weather Monitoring

Several meteorological monitoring masts of up to 200 m in height may also be constructed within the DE to support ongoing operations.

3.2.5.7 Temporary Infrastructure

During construction, various temporary works will be required for the Proposal such as fuel storage, construction laydown areas and site offices. At completion of the construction works, all construction facilities that are no longer required for operational purposes will be removed and the areas rehabilitated.

3.2.5.8 Laydown Areas

Laydown areas will be required to store and stage wind turbine modules and electrical infrastructure modules as part of the installation and assembly process. These areas will be sited with consideration of environmental and heritage values during detailed construction planning. Some laydown areas utilised during construction will become permanent offices and associated ablutions during operation of the Proposal. Laydown areas will be rehabilitated once no longer required.

3.2.5.9 Borrow Pits

The Proposal will require suitable fill material (aggregate and rock) for construction of roads, pads, hardstand and laydowns. Sourcing of aggregate and rock will be informed by the results of geotechnical investigations and in agreement with key stakeholders including Traditional Owners. It is proposed that aggregate and rock be processed through an on-site mobile crushing and screening plant.

3.2.5.10 Dangerous Goods and Storage

An ammonium nitrate facility is proposed to store explosive materials required for quarrying and excavation in hard rock during construction. Storage facilities will be located to meet required separation distances for safe storage of dangerous goods in line with the Safe Storage of Solid Ammonium Nitrate code of practice (DMIRS, 2021). The ammonium nitrate facility will require a security sensitive ammonium nitrate storage licence and potentially a

dangerous goods storage licence if the amount of security sensitive ammonium nitrate stored exceeds manifest quantities (DMIRS, 2021).

3.2.5.11 Temporary Power Supply

The Proposal considers the need for power supply during construction of up to 4 megawatts (MW) of instantaneous load, which is likely to be provided by diesel electricity generation infrastructure. Fortescue will develop and apply approaches to continue to reduce emissions from its construction activities, utilising renewable energy where practicable.

3.2.5.12 Topsoil Stockpiles

Clearing of vegetation and topsoil is required to construct and install the proposed infrastructure. Vegetation and topsoil will be stripped and stored separately in designated stockpiled areas and used to progressively rehabilitate temporarily disturbed areas following completion of construction activities.

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Legend

- Development Envelope
- Turbine Locations
- GOV Towns
- Major Roads
- Fortescue Rail
- Roy Hill Rail
- Indicative Disturbance Footprint
- Approved Disturbance (Nullagine Pilot Wind Farm)

Supporting Infrastructure

- Laydown
- Fuel Storage
- Explosive Storage
- Borrow Areas
- Maintenance Area
- Material Stockpiles
- Site Office
- Substations
- Turkeys Nests

Data Source(s):
Aerial, Fortescue and ESRI
All other data, Fortescue, 2025

N

0 2 4 6 8 10
Kilometers

Figure 3-2
Supporting Infrastructure of the Proposal

Requested By: R. Dorji
Drawn By: R. Kerr
Revised By: rykerr
Approved By:
Scale: 1:300,000
Coordinate System: GDA 1994 MGA Zone 50
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3.2.6 Proposal Timelines

The Proposal is a critical component of Fortescue's decarbonisation commitments for achieving net-zero emissions from mining operations by 2030.

Construction works will commence following the receipt of all necessary approvals which has been estimated to be late 2026. Construction activities are expected to take approximately 34 months. Generation and electrical transmission infrastructure will be progressively commissioned during construction.

It is anticipated that renewable energy generation and supporting electrical infrastructure will be maintained and then replaced at the end of the infrastructure's operational life. The proposed lifespan of the Proposal (approximately 25-30 years) is based on the tenure duration of miscellaneous licences under the *Mining Act 1978*. However, the operational lifespan of the Proposal is anticipated to be longer as the wind resources are expected to be available at the Site for the foreseeable future. Should an extension be required, appropriate approvals will be sought.

3.2.7 Operation and Maintenance

The operation phase of the Proposal is expected to commence in 2028 and will operate 24 hours per day. Operational personnel will consist of a local workforce that reside in an accommodation camp. Activities associated with the operational and maintenance phase include:

- Operation of wind farm and supporting electrical infrastructure (including re-powering),
- Transfer of wind generation energy via substations to the Fortescue Integrated Power Network,
- Dangerous goods storage/chemical system and hazardous materials and waste handling,
- Groundwater abstraction (included in existing licence),
- Treatment of groundwater,
- Raw and demineralised water storage in above ground tanks,
- Maintenance of permanently cleared vegetation, and
- Maintenance of access tracks and internal roads.

3.2.8 Decommissioning and Rehabilitation

The Proposal is expected to operate up to 25-30 years and, with asset life extension (including turbine replacement and repowering), can operate indefinitely. It is intended to restore the environmental values of the Proposal area following the lifespan of the Proposal. Requirements for decommissioning will be established through consultation with relevant stakeholders. A decommissioning management plan will be developed in the years leading up to decommissioning the Proposal.

Rehabilitation will be undertaken for the Proposal following Fortescue's Rehabilitation guideline (45-GU-EN-0009). Progressive rehabilitation will be undertaken during the construction phase, including the rehabilitation of temporary cleared areas following completion of construction activities within specific locations of the wind farm. Rehabilitation will be undertaken once construction has been completed within separate construction areas, rather than after completion of the construction of the entire wind farm. Rehabilitation activities will include all temporary pads and tracks reprofiled back to the natural hillside/terrain, and any excavations backfilled and recontoured to achieve a gentle slope consistent with the surrounding natural landscape, to reduce erosion. Vegetation and topsoil removed during construction will be spread over cleared areas, and all potentially contaminated soil will be removed to an appropriately licensed facility, and rubbish will be removed from the site and disposed of appropriately. All compacted areas will be ripped / scarified to loosen compacted soil and promote vegetation growth. Monitoring of rehabilitated areas will be undertaken during wind farm operations to ensure vegetation becomes self-sustaining.

At such a time as the Proposal is not required and has reached end of life, decommissioning activities will include:

- Agreements for Post-Development Land Use with relevant stakeholders,
- Removal of all infrastructure, vehicles and machinery, unless otherwise agreed with relevant stakeholders,
- Removal from site and recycling, or appropriate disposal, of all infrastructure and waste,
- Decommissioning or repurposing of production bores (covered under existing licence), and
- Rehabilitation / restoration of disturbed areas.

All decommissioning activities will be developed in consultation with relevant stakeholders for Post-Development Land Use. Agreements with stakeholders may include handover of certain Proposal infrastructure (such as access tracks). The responsibility for ongoing maintenance and eventual decommissioning of such Proposal infrastructure will then sit with the relevant stakeholder.

3.2.9 Exclusions

The scope of the Proposal excludes:

- The Nullagine Pilot Wind Farm, consisting of 17 turbines and approximately 50 km of 220 kV transmission line to Christmas Creek Mine.
- Geotechnical and hydrogeological investigations to provide technical data for the Proposal
- Environmental, heritage and other studies and investigations involving fieldwork.

3.3 Location and Regional Context

3.3.1 Physical Environment

3.3.1.1 Climate

The Pilbara is a semi-arid and arid region, which experiences approximately 300 mm of rainfall annually (McKenzie *et al.*, 2003). The weather station at Marble Bar (Site 004106) shows a long-term (from 2000 to 2024) annual rainfall of 386 mm, with rain experienced predominately in January, February and March (Bureau of Meteorology (BoM), 2024). Rainfall at the Christmas Creek mine site weather station shows a long term (2012 to 2022) annual rainfall of 401 mm. Annual mean temperatures within the region range from 12.1°C in winter to 42.1°C in summer (BoM, 2024). Plate 3-4 outlines the monthly rainfall and temperature averages for the Marble Bar station (BoM, 2024).

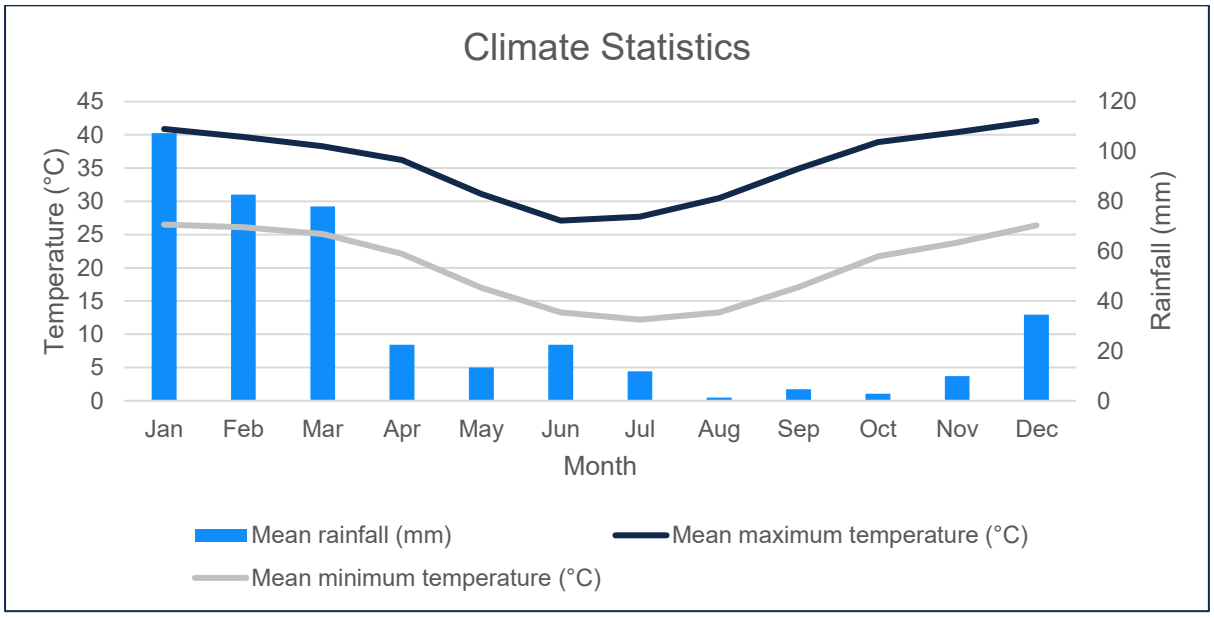

Plate 3-4 Marble Bar Climate Data (Site No. 004106) (BoM, 2024)

3.3.1.2 Geology, Soil and Land Systems

The Pilbara region is formed by a basement of Archanean granite and volcanics, overlain by massive deposits of Proterozoic sediments and volcanics (Semeniuk & Brocx, 2019). The DE comprises of nine geological units described in Table 3-2 and Figure 3-3 (DMIRS, 2018).

There are 12 land systems within the DE (DPIRD, 2022), of which Rocklea and Bonney systems covers more than 76% of the total DE (Table 3-3 and Figure 3-4).

Table 3-2: Geological Units in the Development Envelope (DMIRS, 2018)

Geological units	Description	Area within the DE (ha)	Proportion within the DE (%)
Black Range Dolerite Suite	Dolerite dyke; local gabbro; weakly metamorphosed	18.65	0.02%
Euro Basalt	Basalt, komatiitic basalt, serpentinized peridotite; local dolerite and gabbro sills; minor	108.97	0.12%

Geological units	Description	Area within the DE (ha)	Proportion within the DE (%)
	felsic volcaniclastic rocks and chert; metamorphosed		
Golden Eagle Orthogneiss	Layered orthogneiss derived from tonalite, granodiorite, monzogranite, and pegmatite; includes layers and lenses of amphibolite and ultramafic schist	93.61	0.10%
Hardey Formation	Sedimentary and felsic volcanic rocks; local intrusive rocks	1,529.06	1.70%
Jeerinah Formation	Siliciclastic sedimentary rocks, mafic volcanic rocks and minor felsic volcanic rocks; local carbonate rocks, chert, and dolerite sills	1,697.19	1.89%
Kylena Formation	Massive, amygdaloidal, and vesicular basalt and basaltic andesite; local komatiitic basalt, dacite, and rhyolite	14,773.47	16.42%
Maddina Formation	Massive, amygdaloidal, or vesicular basalt and basaltic andesite; local komatiitic basalt, dacite, and rhyolite	58,475.22	64.99%
Marra Mamba Iron Formation	Chert, banded iron-formation, mudstone, and siltstone; minor carbonate; metamorphosed	11.97	0.01%
Tumbiana Formation	Basaltic volcanic rocks and carbonate rocks	13,265.71	14.74%

Table 3-3: Land Systems Within and Adjacent to the Development Envelope (van Vreeswyk *et al.* 2004).

Land system	Description	Area within the DE (ha)	Proportion within the DE (%)
Bonney system	Low rounded hills and undulating stony plains supporting soft spinifex grasslands	17,802.18	19.79%
Capricorn system	Rugged sandstone hills, ridges, stony footslopes and interfluves supporting low acacia shrublands or hard spinifex grasslands with scattered shrubs	1,427.28	1.59%
Elimunna system	Stony plains on basalt supporting sparse acacia and cassia shrublands and patchy tussock grasslands	292.96	0.33%
Granitic system	Rugged granitic hills supporting shrubby hard and soft spinifex grasslands	77.48	0.09%
Laterite system	Low lateritic plateaux, mesas, buttes and gravelly rises and plains supporting sparse mulga shrublands	880.19	0.98%
McKay system	Hills, ridges, plateaux remnants and breakaways of meta sedimentary and sedimentary rocks supporting hard spinifex grasslands with acacias and occasional eucalypts	5,704.65	6.34%
Newman system	Rugged jaspilite plateaux, ridges and mountains supporting hard spinifex grasslands	159.82	0.18%

Land system	Description	Area within the DE (ha)	Proportion within the DE (%)
River system	Narrow, seasonally active flood plains and major river channels supporting moderately close, tall shrublands or woodlands of acacias and fringing communities of eucalypts sometimes with tussock grasses or spinifex	499.67	0.56%
Robe system	Low plateaux, mesas and buttes of limonite supporting soft spinifex and occasionally hard spinifex grasslands	4,320.07	4.80%
Rocklea system	Basalt hills, plateaux, lower slopes and minor stony plains supporting hard spinifex and occasionally soft spinifex grasslands with scattered shrubs	51,065.60	56.76%
Spearhole system	Gently undulating gravelly hardpan plains and dissected slopes supporting groved mulga shrublands and hard spinifex	274.61	0.31%
Wona system	Basalt upland gilgai plains supporting Roebourne Plains grass and Mitchell grass tussock grasslands, minor hard spinifex grasslands or annual grasslands/herbfields	7,469.36	8.30%

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Legend

- Development Envelope
- GOV Towns
- Major Roads
- Fortescue Rail
- Roy Hill Rail
- Indicative Disturbance Footprint
- Approved Disturbance (Nullagine Pilot Wind Farm)

Geological Units

- Black Range Dolerite Suite
- Euro Basalt
- Golden Eagle Orthogneiss
- Hardey Formation
- Jeerinah Formation
- Kylena Formation
- Maddina Formation
- Marra Mamba Iron Formation
- Tumbiana Formation

Data Source(s):
Aerial, Fortescue and ESRI
All other data, Fortescue, 2025

N

0 2 4 6 8 10
Kilometers

Figure 3-3
Geological Units
within the Development Envelope

Requested By: R. Dorji	Date: 1/28/2026
Drawn By: R. Kerr	Size: A4L
Revised By: rykerr	Revision: 1
Approved By:	Confidentiality: 0
Scale: 1:300,000	
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Project Name: 4519OP002_MP_EN_0093_PartIV	
Document Name: 4519OP002_MP_EN_0093_004_r1_Geological_Units	

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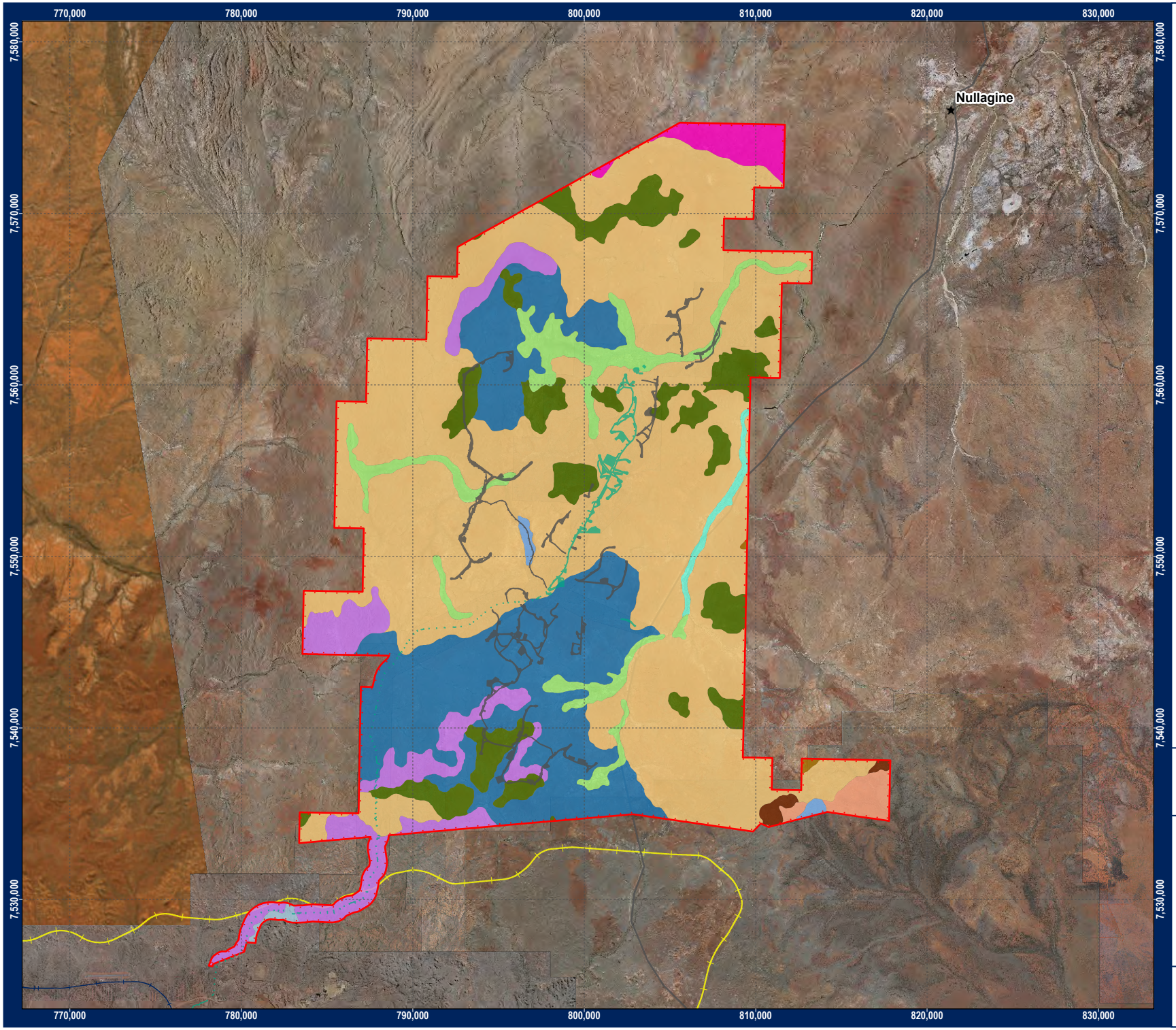

Legend

- Development Envelope
- GOV Towns
- Major Roads
- Fortescue Rail
- Roy Hill Rail
- Indicative Disturbance Footprint
- Approved Disturbance (Nullagine Pilot Wind Farm)

Land Systems

- Bonney System
- Capricorn System
- Elimunna System
- Granitic System
- Laterite System
- McKay System
- Newman System
- River System
- Robe System
- Rocklea System
- Spearhole System
- Wona System

Data Source(s):
Aerial, Fortescue and ESRI
All other data, Fortescue, 2025

N

0 2 4 6 8 10
Kilometers

Figure 3-4
Land Systems
within the Development Envelope

Requested By: R. Dorji
Drawn By: R. Kerr
Revised By: rykerr
Approved By:
Scale: 1:300,000
Coordinate System: GDA 1994 MGA Zone 50
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3.3.1.3 Hydrology and Hydrogeology

The DE is located within the Pilbara Surface Water Area and Pilbara Groundwater Area proclaimed under the RIWI Act (DWER, 2018a; DWER, 2018b). The DE is not located within any Public Drinking Water Source Areas and does not intersect any Rivers proclaimed under the RIWI Act (DWER, 2024a; DWER, 2018b). The DE occurs within the De Grey River Basin and the Fortescue River Basin (DWER, 2018c), and it overlaps four catchments: (1) Coongan River, (2) Shaw River, (3) Fortescue River and (4) Nullagine River (DWER, 2024c).

Groundwater at the site is contained within fractured and weathered zones in the Fortescue Group basalts. The existing bores target these zones, with depths ranging from 34 to 114 m. Groundwater levels typically range from 5 to 17 m below ground level (mbgl) with groundwater quality ranging from fresh to brackish 522 µS/cm to 2,930 µS/cm.

Inland Waters is discussed further in Chapter 10.1 (Other Factors).

3.3.1.4 Environmentally Sensitive Areas

The Proposal does not intersect any mapped Environmentally Sensitive Areas (ESAs) (DWER, 2021b). The nearest ESA is approximately 9.3 km south of the DE and associated with the Fortescue Marsh.

3.3.1.5 Conservation Reserves

The Proposal does not intersect any DBCA managed conservation estate, private conservation reserves or lands of conservation interest to the State (DBCA, 2024a; DBCA, 2024b). The closest DBCA conservation estate to the DE is the Fortescue Marsh Nature Reserve, located approximately 9.3 km south of the DE. The closest land of conservation interest is a parcel of land formally part of the Hillside Pastoral Lease and now classed as Unallocated Crown Land (proposed for conservation), located approximately 7.76 km southwest.

3.3.1.6 Wetlands

The DE does not intersect any State or Nationally Important Wetlands, with the closest being Fortescue Marshes which is approximately 9.3 km south of the DE (DBCA, 2018). The DE also does not overlap any Ramsar Wetlands; however, the Fortescue Marshes Draft Proposed Ramsar Addition is approximately 6 km southwest of the DE. The DE overlaps the Fortescue River catchment, which contains the Fortescue Marshes.

3.3.1.7 Contaminated Sites and Acid Sulfate Soils

No contaminated sites listed on the Contaminated Sites Database (DWER, 2024b) are within the DE. The closest known contaminated site is 100 km south of the DE in Newman.

Acid Sulfate Soils (ASS) are naturally occurring soils and sediments which contain metal sulfides. When potential ASS is exposed to air, the iron sulphides within the soil react with oxygen and water, producing a variety of iron compounds and sulphuric acid (ANZG, 2018). The Atlas of Australian Acid Sulfate Soils describes the national map of available ASS mapping on coastal states and territories and ASS qualification inferred from surrogate databases based on national and state soils, hydrography and landscape coverages for the remaining Australian territory. The vast majority of the DE (87.05%) is described as having an extremely low probability for occurrence of ASS. However, this classification has a confidence level 4, which means that this is a provisional classification inferred from surrogate data with

no on-ground verification (Fitzpatrick *et al.*, 2011). The detailed classification is described in Table 3-4 and Figure 3-5.

Table 3-4: Acid Sulfate Soils within the Development Envelope

Classification*	Probability of occurrence in mapping unit	Area within DE (ha)	Description
An(p4)	High Probability of occurrence - >70% chance of occurrence in mapping unit.	27.59	ASS generally within upper 1 m in wet / riparian areas with Sodosols, Chromosols and Dermosols (Isbell, 1996).
Bn(p4)	Low Probability of occurrence - 6-70% chance of occurrence in mapping unit.	11,626.63	ASS generally within upper 1 m in wet / riparian areas with Sodosols, Chromosols and Dermosols (Isbell, 1996).
Cn(p4)	Extreme low probability of occurrence - 1-5% chance of occurrence in mapping unit with any occurrences in small, localised areas.	72,877.90	ASS generally within upper 1 m in wet / riparian areas with Sodosols, Chromosols and Dermosols (Isbell, 1996).
Cq(p4)		5,441.74	ASS generally within upper 1 m in wet / riparian areas with Kandosols, Ferrosols, Tenosols, Rudosols and Podosols (Isbell, 1996).

*P - Potential acid sulfate soil = sulfidic material; 4 - No necessary analytical data are available, and classifier has little knowledge or experience with ASS, hence classification is provisional.

Legend

- Development Envelope
- GOV Towns
- Major Roads
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- Approved Disturbance (Nullagine Pilot Wind Farm)

Acid Sulfate Soils

- An(p4)
- Bn(p4)
- Cn(p4)
- Cq(p4)

Data Source(s):
Aerial, Fortescue and ESRI
All other data, Fortescue, 2025

N

0 2 4 6 8 10
Kilometers

Figure 3-5
Acid Sulfate Soils
within the Development Envelope

Requested By: R. Dorji	Date: 1/28/2026
Drawn By: R. Kerr	Size: A4L
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Document Name: 4519OP002_MP_EN_0093_006_r1_Acid_Sulfate	

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3.3.2 Biological Environment

3.3.2.1 Bioregions

There are 89 recognised Interim Biogeographic Regionalisation for Australia (IBRA) regions that have been defined (DCCEEW, 2023a).

The DE lies within the Pilbara Bioregion, and the Chichester and Fortescue Subregions defined by the IBRA, Version 7 (DCCEEW, 2023a). The Pilbara Bioregion is characterised as extensive coastal plains, mountain ranges, and active drainage in the Ashburton, Fortescue and De Grey River systems. The vegetation predominately consists of low mulga woodlands or snappy gum over tussock and hummock grasses (McKenzie *et al.*, 2003).

The Chichester subregion (PIL1) is described by Kendrick and Mckenzie (2001) as "undulating Archaean granite and basalt plains include significant areas of basaltic ranges". The vegetation within this subregion consists of shrub steppe characterised by *Acacia inaequilatera* over *Triodia wiseana* (formerly known as *Triodia pungens*) hummock grasslands, with *Eucalyptus leucophloia* tree steppes on ranges. Land use within the area includes grazing, native pasture, conservation, urban and mining (Kendrick & Mckenzie, 2001).

The Fortescue subregion (PIL2) is described by Kendrick (2001) as "Alluvial plains and river frontage". Extensive salt marsh, mulga-bunch grass, and short grass communities on alluvial plains in the east. Deeply incised gorge systems occur in the western (lower) part of the subregion. River gum woodlands fringe the drainage lines. This subregion is noted as being the northern limit of Mulga (*Acacia aneura*). The Millstream aquifer, an extensive calcrete aquifer (originating within a palaeo-drainage valley), lies between the Chichester and Hamersley Ranges and feeds numerous permanent springs in the central Fortescue, supporting large permanent wetlands with extensive stands of river gum and cadjeput (*Melaleuca)* woodlands. The Fortescue Marsh is the key feature of the subregion within the local area of the Proposal. Land use within the area includes grazing, native pasture, unallocated crown land, crown reserves, conservation and Aboriginal land (Kendrick, 2001).

3.3.2.2 Pre-European Vegetation

Pre-European vegetation mapping based on Beard (1975; 1990) describes five vegetation associations within the DE. The DE is predominantly composed of vegetation association 173 (98.34%). The remainder of the DE is comprised of vegetation associations 18, 29, 93 and 562. All other vegetation associations each represent less than 1.0% of the DE. The pre-European vegetation associations within the DE and their current extent are discussed further in Chapter 7 (Flora and Vegetation).

3.3.2.3 Threatened and Priority Ecological Communities

A description of Threatened and Priority Ecological Communities (PECs) within the DE is provided in Chapter 7 with a summary provided below.

Six PECs were identified within approximately 50 km of the DE, including one overlapping the DE:

1. 'Four plant assemblages of the Wona Land System' (Priority (P) 1, P3) in multiple locations throughout the DE. This PEC comprises four assemblages:
    - Cracking clays of the Chichester and Mungaroona Range (P1),

- Annual Sorghum grasslands on self-mulching clays with a moderate-dense overlay of rocks (P1),
- Mitchell grass plains (*Astrebela* spp.) on gilgai (P3), and
- Mitchell grass and Roebourne Plain grass (*Eragrostis xerophila*) plain on gilgai (P3).

2. 'Fortescue Marsh (Marsh Land System)' (P1) located approximately 9.3 km southwest of the DE,
3. 'Stony saline clay plains of the Mosquito Land system' (P3): approximately 5.63 km northeast and outside of the DE,
4. 'Narbung Land System' (P3): approximately 37 km south of the DE,
5. 'Freshwater claypans downstream of the Fortescue Marsh - Goodiadarrie Hills on Mulga Downs Station.'(P1): approximately 30 km south of the DE, and
6. 'Vegetation of sand dunes of the Hamersley Range/Fortescue Valley' (P3): approximately 51 km south and outside of the DE.

Ecologia (2025a) recorded vegetation type VfAl (6,809.26 ha within the DE), which is consistent with the DBCA listed community 'Four plant assemblages of the Wona Land System' (P1) and more specifically to the 'Cracking clays of the Chichester and Mungaroona Range' (P1).

3.3.2.4 Threatened and Priority Flora

A description of Threatened and Priority flora within the DE is provided in Chapter 7 with a summary provided below.

Threatened Flora

The desktop survey identified one Threatened flora species within 50 km of the DE. There are three records of *Quoya zonalis* (Pilbara Foxglove), listed as Endangered under the *Biodiversity Conservation Act 2016* (BC Act) and EPBC Act, 9 km north of the DE. Ecologia (2025a) recorded 21 individuals within the survey area, however, they were recorded 4.5 km north, outside of the DE.

Priority Flora

The desktop survey identified 59 Priority flora species listed by DBCA and/or Fortescue databases that have previously been recorded within approximately 50 km of the DE, of which ten species occurred within the DE. Ecologia (2025a) recorded 13 Priority flora species within the DE, including five species which were previously recorded.

3.3.2.5 Threatened and Priority Fauna

A description of Threatened and Priority fauna within the DE is provided in Chapter 8 with a summary provided below.

Threatened Fauna

Four Threatened fauna and two Migratory species protected under the BC Act were recorded during the surveys within the DE, including Grey Falcon (*Falco hypoleucos*); Northern Quoll (*Dasyurus hallucatus*); PLNB (*Rhinonicteris aurantia*); Pilbara Olive Python (*Liasis olivaceus barroni*); Fork-tailed Swift[2] (*Apus pacificus*); and the Oriental Plover (*Charadrius veredus*).

Based on the likelihood of occurrence assessment undertaken, a further three Threatened fauna species protected under the BC Act are considered to have a moderate or above likelihood of occurrence in the DE, including Night Parrot (*Pezoporus occidentalis*); Australian Painted Snipe (*Rostratula australis*); and Common Greenshank (*Tringa nebularia*).

One 'Other Specially Protected' species (Peregrine Falcon (*Falco peregrinus*)), and eight Migratory species, listed under the BC Act are considered to have a moderate or above likelihood of occurrence in the DE.

Priority Fauna

Four Priority fauna species listed by DBCA have been recorded within the DE, including Brush-tailed Mulgara (*Dasycercus blythi*); Western Pebble-mound Mouse (*Pseudomys chapmani*); Northern Short-tailed Mouse (*Leggadina lakedownensis*) and Gane's Blind Snake (*Anilios ganei*). In addition, the Long-tailed Dunnart (*Antechinomys longicaudata*) is considered to have a high likelihood of occurrence within the DE.

3.3.3 Social Context

A description of social surroundings values within the DE is provided in Chapter 9 with a summary provided below.

3.3.3.1 Native Title

The DE is located within the following native title determination areas which have the Palyku-Jartayi Aboriginal Corporation (PJAC) as the registered native title body corporate:

- Palyku Part A native determination area (WCD2019/002), determination date March 2019.

The DE is also located within the following native title determination area which has the Karlka Nyiyaparli Aboriginal Corporation (KNAC) as the registered native title body corporate:

- Nyiyaparli People native title determination area (WCD2018/008), determination date September 2018.

[2] Ecologia (2025b) and the BBSUS (Ecologia, 2026) refer to the species as Fork-tailed Swift, whereas HBI (2026a) and the BBAMP refer to it as Pacific Swift. For the purposes of this report, the species is referred to as Fork-tailed Swift.

Consultation with Palyku-Jartayi Aboriginal Corporation (PJAC) and Karlka Nyiyaparli Aboriginal Corporation (KNAC) has been undertaken for the Proposal and is detailed in Section 4.3.

3.3.3.2 Land Use

The Proposal is sited within the Nullagine locality and the northern-most edge of the DE is located approximately 9 km southwest of Nullagine town (at the northern extent of the DE). The Proposal is located in the Shire of East Pilbara. The main town sites within the Shire are Newman, Marble Bar and Nullagine. The Aboriginal communities of Goodabinya and Irrungadji are located on the edge of Marble Bar and Nullagine townsites respectively.

Dominant land uses in the region include pastoralism, mining and conservation reserves (DPIRD, 2023). The Shire is rich in mining and pastoral activities, providing a significant contribution to the State and National economies. There are 109 active iron ore mines located within the East Pilbara, producing half of the Pilbara's total iron ore production and generating $57.6 billion in commodities in 2020 (Shire of East Pilbara, 2022).

The DE is situated on the Bonney Downs, Hillside and Roy Hill pastoral leases.

The southern edge of the DE is adjacent to the Christmas Creek Iron Ore Mine Expansion DE (as per MS 1033). Additional operational mines within 50 km of the DE are associated with East Pilbara Iron Ore (Fortescue), Marillana Agate, McPhee Creek and Roy Hill Iron Ore (DMIRS, 2024).

4 STAKEHOLDER ENGAGEMENT

4.1 Key Stakeholders

A stakeholder identification process was undertaken by Fortescue to identify community and government stakeholders with an interest in the Proposal, or those that may be directly and/or indirectly affected. These key stakeholders have been and will continue to be engaged with throughout the assessment process and life of the Proposal (Table 4-1).

Table 4-1: Key Stakeholders Identified for the Proposal

Stakeholder Category	Organisation	Primary Area of Interest
Government Agencies	Department of Water and Environmental Regulation (DWER) – EPA Services, Licencing, Regional Services	Understanding of impacts to Preliminary Key Environmental Factors Environmental impact assessment Watercourse Water Protection
	Department of Biodiversity, Conservation and Attractions (DBCA)	Environmental impact assessment Environmental approvals
	Department of Mines, Petroleum and Exploration (DMPE) (formerly Department of Energy, Mines, Industry, and Safety (including Worksafe) (DEMIRS))	Environmental risk assessments
	Department of Energy and Economic Diversification (DEED) (formerly Department of Jobs, Tourism, Science and Innovation (JTSI)	Development of renewable energy asset
	Department of Climate Change, Energy, Environment and Water (DCCEEW).	Understanding of impacts to MNES Environmental impact assessment Responsible for environmental approvals
	DPLH	Appropriate land use Endorsement in line with existing and future planning requirements
	WA Treasury	Economic impacts of the Proposal (WA Treasury)
	Pilbara Development Commission	Remit to manage drive and growth in the Pilbara region
Native Title Holders	Palyku People	• Native Title rights and access to country. • Management of Aboriginal Cultural Heritage and Cultural Values. • Potential impacts to values including flora, fauna and water, and changes to land use. • Contract opportunities.
	Nyiyaparli People	
Local Government	Shire of East Pilbara	• Project development. • Project economic benefits during construction and operations phases.
Landholders	Bonney Downs Pastoral Station	

Stakeholder Category	Organisation	Primary Area of Interest
	Hillside Pastoral Station	Pastoral lease holder - impacts to pastoral activity
	Roy Hill Pastoral Station	
Community and Special Interest Groups	Association of Mining and Exploration Companies (WA)	Potential impacts to environmental values, Threatened species and communities. Environmental management.
	Chamber of Minerals and Energy (WA)	Potential impacts to environmental values, Threatened species and communities. Environmental management.
	Beeliar Group	Potential impacts to environmental values and Threatened species.
	Conservation Council WA	Potential impacts to environmental values in particular listed plants and vegetation communities
	Australian Conservation Fund	Potential impacts to environmental values and Threatened species
	Wildflower Society	Potential impacts to environmental values and Threatened species.
	World Wildlife Fund (Australia)	Potential impacts to environmental values, Threatened species and communities. Environmental management.
	Greening Australia	Potential impacts to environmental values, Threatened species and communities. Environmental management.
	Kimberley Pilbara Cattlemen's Association	• Potential impacts to pastoral activities and viability of pastoral stations. • Land use.
	Pilbara Mesquite Management Committee	Potential environmental impacts such as weed introduction and spread.
	Rangelands NRM	Potential impacts and changes to land use. Potential environmental impacts such as weed introduction and spread, fire management, feral species, Threatened species habitat.
	Save the Bilby Fund	Potential impacts to environmental values in particular Bilby Habitat.
	The Wilderness Society of WA Inc	Potential impacts to environmental values and Threatened species
	Birdlife WA	Potential impacts to environmental values in particular Threatened birds including the Night Parrot and Migratory birds that may utilise Fortescue Marsh.
	Australian Wildlife Conservancy	Potential impacts to environmental values and Threatened species.
	Care for Hedland	Potential impacts to environmental values and Threatened species.

4.2 Stakeholder Engagement Process

Fortescue commenced consultation for the proposal in early 2023 through a combination of face-to-face meetings, presentations and letters to key community stakeholders.

Consultation undertaken to date has provided Fortescue with the opportunity to discuss the Proposal with stakeholders and gain valuable feedback. This feedback was considered during the development of the Proposal.

In order to undertake effective consultation, a consultation program was developed specifically for this Proposal. The objectives of the consultation program included the following:

- To identify and engage key stakeholders,
- To identify and verify areas of stakeholder feedback for social and environmental values,
- To establish a robust consultation approach and demonstrate that appropriate consultation has been undertaken,
- To assess stakeholder issues/concerns so that proposed impacts are minimised to 'as low as reasonably practicable',
- Key consultation activities included the following:
    - Correspondence to potentially impacted parties providing information on the Proposal, requesting feedback and offering detailed briefings, and
    - Meetings with decision making authorities to discuss and obtain feedback on the Proposal.

One-on-one briefings and feedback sessions with specific stakeholders.

4.3 Stakeholder Consultation

Detailed consultation has been undertaken with key Federal, State and Local regulatory authorities in addition to consultation with Traditional Owner groups and key landholders. Consultation on the Proposal will continue throughout the environmental impact assessment and for the life of the Proposal. A summary of consultation undertaken to date is shown in Table 4-2.

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Table 4-2: Stakeholder Consultation Undertaken for the Proposal

Stakeholder	Date	Engagement Type & List of Participants	Topics raised / Discussed	Response / Outcome
Government Agencies and Regulators				
Department of Climate Change, Environment, Energy and Water (Cth) (DCCEEW)	6 June 2024	In Person Meeting: DCCEEW: • Kylie Calhoun (Branch Head, Nature Positive Regulation Division) • Candice Cooke (Director, Nature Positive Regulation Division) Fortescue: • Matthew Dowling – Manager Environment Primary Approvals • Jarrod Pittson – Group Manager Environment and Governance	Meeting to provide an update on the following projects: • East Pilbara Generation Hub • Bonney Downs Wind • Nullagine Pilot Wind • NSJ West Solar (now Turner River Solar Hub) • Mindy South and Nyidinghu • Western Hub	DCCEEW expressed support for the design principles for the proposed solar and wind projects.
	2 December 2025	Email from Katie Williams (DCCEEW Assistant Director) to Matt Dowling re Nullagine Pilot Wind Farm	DCCEEW confirmed no more information re the Nullagine Pilot Wind Farm project was required. DCCEEW recommended to include a clear description and definition of the proposed action, specifying which components are included and excluded.	Fortescue withdrew Bonney Downs wind farm referral and resubmitted following DCCEEW recommendations.
Department of Water and Environment Regulation – EPA	23 April 2023	In person meeting:	Updates provided on decarbonisation project definition and timeframes	The outcomes of the meeting relevant to Bonney Downs were:

Stakeholder	Date	Engagement Type & List of Participants	Topics raised / Discussed	Response / Outcome
Services (Green Energy Division (GED))		• Alicia Dudzinska – Manager Solar and Wind, • Samara Rogers – Senior Environmental, and • Koby Anderson Senior Environmental. Fortescue: • Matthew Dowling – Manager Environment, Primary Approvals and Governance, • Parveen Bauer – Manager Environmental Mining Approvals, and • Jacob Azzarello – Principal Environment.	Projects discussed included: • Solomon Solar Farm, • Cloudbreak Solar Farm, • NSJ West Solar Farm (now Turner River Solar Hub), • EPGH Wind Farm, • Nullagine Pilot Wind Farm, • Bonney Downs Wind Farm, • Discussion on using current Ministerial Statements to support solar developments within current mining areas, • Query on regulatory agency co-operation on streamlining green energy approvals between DWER and DEMIRS.	EPA / GED was generally supportive of the proposed projects and approvals pathway. Suggestion to have pre-referral meeting prior referral to go through defined projects and potential impacts on preliminary environmental factors.
	30 October 2023	Meeting with Fortescue to discuss decarbonisation and detailed environment discussions. DWER: • Shaun Meredith, • Tracey Hassell, • Tania Ashworth, and • Carrie Sunderland.	Follow-up meeting from 12/10/23 to discuss current level of environmental information and level of engineering design of the projects. Discussion mainly focused on preferred environmental approval pathways and what information is required to achieve an “Assessed on Referral Information” (ARI). Key projects discussed included: • NSJ West Solar Farm (now Turner River Solar Hub),	The outcomes of the meeting relevant to the Bonney Downs were: • The EPA is concerned about the life cycle of green energy technologies and the waste streams that will result from the maintenance or replacement of infrastructure, • GED recommend a follow up meeting in early 2024 to discuss the scope of the impact assessment in

Stakeholder	Date	Engagement Type & List of Participants	Topics raised / Discussed	Response / Outcome
		Fortescue: • Jarrod Pittson – Group Manager Environment and Governance, and • Matt Dowling – Manager Environment, Primary Approvals and Governance.	• EPGH, • Bonney Downs Wind Farm, • Cloudbreak Solar Farm, and • Solomon Solar Farm.	order to get agreement on the studies and assessment methodology ahead of referral, and • GED recommended Fortescue investigate the supply chain and logistics associated with the proposal. Additional approvals may be required to support the importation and transport of infrastructure.
	16 January 2024	In person meeting: EPA / GED: • Tania Ashworth – Manager Solar and Wind, • Samara Rogers – Senior Environmental, and • Koby Anderson Senior Environmental. Fortescue: • Jarrod Pittson – Group Manager Environment and Governance, • Lazaro Rogue-Albelo – Functional Lead	Overview of environmental studies, bird and bat research project and project definition and timeframes Projects discussed included: • NSJ West Solar Farm, • EPGH Wind Farm, and • Bonney Downs Wind Farm. Preliminary key environmental factors (flora and vegetation, terrestrial fauna and social surroundings), sensitive receptors identified, surveys outcomes discussed and ongoing work. Proposed approval pathway of ARI was discussed and how to minimise requests for further information.	The outcomes of the meeting relevant to Bonney Downs were: • EPA / GED was generally supportive of the proposed projects and approvals pathway. Suggestion to have pre-referral meeting prior referral to go through defined projects and potential impacts on preliminary environmental factors, • Support to streamline approval pathway and reduce request for further information by providing as much information up front as possible and highlighting any outstanding information that is pending, and • Supportive of accredited assessments with the Commonwealth.

Stakeholder	Date	Engagement Type & List of Participants	Topics raised / Discussed	Response / Outcome
		Biodiversity & Science, • Jacob Azzarello – Principal Environment, and • Rikki Hughes - Environmental Advisor.		
	30 October 2024	In person meeting EPA/GED • Sam Rycken • Helen Lafuente • Tayla Hunter Fortescue • Matt Dowling – Manager Primary Approvals • Jacob Azzarello – Principal Environment • Sofie Springer – Senior Environmental Advisor	Meeting held at EPA premises to provide an overview on Fortescue's decarbonisation proposals including: • Turner River Solar Hub • East Pilbara Generation Hub • Nullagine Pilot Wind Farm	EPA were supportive of the concept to submit detailed proposals and proposed approval timeframes.
	8 September 2025	Online meeting EPA/GED • Lindsay Bourke - Manager (Wind and	Pre-referral presentation to discuss the approvals pathway for the Bonney Downs Part IV Referral. Fortescue provided an overview of the Proposal, studies to date and environmental impact assessment.	The GED were supportive of Fortescue's approach to submit a detailed referral and proposed approvals pathway.

Stakeholder	Date	Engagement Type & List of Participants	Topics raised / Discussed	Response / Outcome
		Solar) – Green Energy Approvals • Ben Gates - A/Manager (Hydrogen) Green Energy Fortescue • Matt Dowling – Manager Primary Approvals • Sofie Springer – Principal Environment		
	22 January 2026	In person meeting EPA/GED • Ben Gates – A/Manager Green Energy • Nicole Zago • Tayla Hunter Fortescue • Matt Dowling – Manager Primary Environmental Approvals • Jacob Azzarello – Principal Environment	Pre-referral presentation to discuss the revised Proposal which has been updated to: • Significantly reduce disturbance footprint and number of turbines. • Propose fauna habitat exclusion zones • Exclude Nullagine pilot wind farm from the Proposal • Include outstanding studies/management plans that were not available in 2025.	The GED were supportive of Fortescue's approach to submit an updated referral with the changes outlined.

Stakeholder	Date	Engagement Type & List of Participants	Topics raised / Discussed	Response / Outcome
		• Vlad Rios Vera – Senior Environmental Advisor		
JTSI	12 October 2023	Meeting with JTSI, DWER and DEMIRS JTSI: • Lakshmi Jones – Project Support Officer Green Energy Major Projects, and • David Alexander. DWER: • Shaun Meredith – Executive Director Green Energy Directorate. DEMIRS: • Dan Endacott - General Manager Mining Environment. Fortescue: • Matthew Dowling – Manager Environment, Primary Approvals • Jacob Azzarello – Principal Environment.	Presentation of key Decarbonisation Projects to the Green Energy Directorate (GED), Department of Energy, Mines, Industry and Safety (DEMIRS) and JTSI. Assessment pathways for the proposed decarbonisation projects were discussed outlining the preferred approach; key projects discussed included: • Seeking assessment on referral information. Main goals for the decarbonisation projects include: • Fortescue requires ~1 GW solar and ~1 GW of wind, planned to be built in tranches - 2023 - 2028 to achieve 2030 Business Decarbonisation target. Support for efficient and accelerated approval pathways - interagency cooperation	The outcomes of the meeting relevant to Bonney Downs were: • No objections from Traditional Owners are seen as a key component, • DEMIRS verbally indicated that parallel processing could be undertaken for Mining Proposals while Part IV assessments were being completed. Indicating that approval of the Mining Proposal could not be given until Ministerial approval was granted, and • DEMIRS verbally indicated submission of Mining Proposals prior to tenure grant was possible (e.g. PTP 4 Strategic Mining Proposal) for assessment, however approval of Mining Proposal still requires tenure grant. Supportive of Fortescue Decarbonisation projects however indicated that sufficient information for projects will be required to facilitate streamlined approvals / assessments.

Stakeholder	Date	Engagement Type & List of Participants	Topics raised / Discussed	Response / Outcome
	28 January 2025	In person presentation Representatives from JTSI's State Agreement and Green Energy teams	No State Agreement approvals required for Bonney Downs scope. JTSI, as administrator of Fortescue's State Agreements, was briefed on Fortescue's Social Impact Assessment of the Pilbara Decarbonisation Program, of which Bonney Downs is a key component. Christmas Creek mine was developed and operates under the Chichester State Agreement and will receive energy from the Bonney Downs project.	The presentation was received favourably, and JTSI requested to be updated on the rollout of the Social Impact Assessment to relevant impacted stakeholders of the Program.
	25 June 2025	In person presentation JTSI: • Gerard Treacy – General Manager • Guy Chandler – Project Manager Green Energy Major Projects Fortescue: • Leigh Dowie – Senior Manager Green Power Delivery • Matthew Dowling – Manager Primary Approvals • Diana Ting – Manager Port and State Approvals • Zena Harman – Senior Manager Sustaining	Fortescue presentation of key decarbonisation projects and approvals pathways to JTSI Green Energy Major Projects team.	Presentation was well received by JTSI and JTSI will continue discussions around limited transport capacity for wind turbine blades with the Department of Transport (DoT). In particular, the potential constraints around OSOM movements and the need for improved coordination of transport logistics for renewable energy projects in the Pilbara.

Stakeholder	Date	Engagement Type & List of Participants	Topics raised / Discussed	Response / Outcome
		Environmental Approvals		
Local Government				
Shire of East Pilbara (SoEP)	20 May 2025	Pre-referral notification letter sent via email. Matt Dowling to Steve Gould	Notification of the environmental assessment process for the Proposal and update on Fortescue's plan to submit a referral under Part IV of the EP Act to the Western Australian EPA.	The letter was acknowledged during meeting with the SoEP on 21 May 2025. No queries raised.
	21 May 2025	Online meeting: SoEP: • Steven Harding – CEO • Etienne Vorster - Director of Infrastructure Services • Steven Gould – Manager of Strategy and Partnerships Fortescue: • Katie Voss – Manager Communities Australia • Jacob Azzarello – Principal Environment • Ben Nicholson – Principal Communities • Adrian Marcello – Development Manager Green Power • Stephen Borovac – Senior Project	Fortescue and Shire of East Pilbara monthly meeting. Fortescue provided updates on the following: • Decarbonisation projects updates including hillside access road modifications and Bonney Downs Wind Farm. • Fortescue Communities update including Welcome to Newman, Community Grants and Community Development Plan	The outcomes of the meeting relevant to Bonney Downs Wind Farm were: • SoEP supportive of ongoing engagement with Palyku and Nyiyaparli and Pastoralists regarding the Bonney Downs Wind Farm. • Interest in significant fauna recorded, however no concerns raised. • No concerns raised regarding visual impacts from Marble Bar Road.

Stakeholder	Date	Engagement Type & List of Participants	Topics raised / Discussed	Response / Outcome
		Engineer Decarbonisation • Janelle Fell – Senior Tenements Specialist		
Surrounding Landowners				
Bonney Downs Pastoral (BDS) Station	11 Mar 2025	In person meeting: • Bonney Downs and Corunna Downs. Pastoralist: • Erica Goyder (Owner / Director), • Mike Smith (Tenement Manager), and • Robert Edel (Consultant/Lawyer). Fortescue: • Damon Edwards (General Manager Tenure and Access), • Max Coyne (Manager Pastoral Access), • Leigh Dowie (Senior Manager Green Power Delivery), and • Matthew Dowling (Manager Primary Environmental Approvals).	Meeting to provide an update on to present project updates and environmental impacts for the East Pilbara Generation Hub (EPGH) and Bonney Downs Wind Farm. • BDS noted general concerns will all relevant social surroundings factors (visual, noise, dust and vibration) BDS noted turbine locations are generally on ridges. Queried feasibility of road access to ridges and management of associated erosion.	The outcomes of the meeting relevant to Bonney Downs were: • Fortescue responded that it could assess surroundings factors (visual, noise, dust and vibration) in areas of importance as nominated by BDS. • Fortescue response to turbine locations: ○ Road access is planned to accommodate max gradient for cranes and is not considered a risk, ○ Surface runoff will be dealt with in corresponding studies and Bonney Downs is invited to comment on any areas of particular concern for Fortescue assessment, and ○ Fortescue invited BDS to nominate areas of importance (as mentioned above) for further or more focussed social surrounds assessment. • Fortescue committed to send a letter or email inviting BDS to nominate areas of importance for

Stakeholder	Date	Engagement Type & List of Participants	Topics raised / Discussed	Response / Outcome
				further or more focussed social surrounds assessment
	14 Mar 2025	Email sent to BDS from Matthew Dowling (Manager Primary Environmental Approvals).	Email requesting BDS to provide nominated areas of importance for focussed social surroundings assessments	No response.
	30 Jun 2025	Email sent to Pastoralist by M Coyne, reviewing minutes/actions from March meeting, seeking feedback to M Dowling's request, noting next meeting was due post response to M Dowling's email	Further meeting request by Fortescue	No reply re meeting, Pastoralist responded to social surround assessment as below.
	30 Jun 2025	Email received from Bonney Downs responding to Matthew Dowling (Manager Primary Environmental Approvals)	Email from Erica Goyder requesting Fortescue to conduct studies in the areas proposed by Matt Dowling.	Fortescue has undertaken studies requested: • Noise and vibration assessments • Dust assessment • Visual impact assessment • Surface water or groundwater assessment.
	19 Aug 2025	Email sent by M Coyne, further meeting request		Pastoralist noted back in Per Aug 29th, will check with her lawyer's availability and advise soon.
Hillside Pastoral Station	22 May 2025	Pre-referral notification letter sent via email. Matt Dowling (Fortescue) to Brent Smoothy; Panorama Station Owner	Notification of the environmental assessment process for the Proposal and update on Fortescue's plan to submit a referral under Part IV of the EP Act to the Western Australian EPA	No response.
Roy Hill Pastoral Station	22 May 2025	Pre-referral notification letter sent via email. Matt Dowling	Notification of the environmental assessment process for the Proposal and update on	Fortescue has provided a map with the Roy Hill Pastoral Station extent and Proposed

Stakeholder	Date	Engagement Type & List of Participants	Topics raised / Discussed	Response / Outcome
		(Fortescue) to Shirene Backhouse Administrator for Roy Hill Pastoral Station.	Fortescue's plan to submit a referral under Part IV of the EP Act to the Western Australian EPA. Roy Hill requested the Development Envelope Spatial File.	Bonney Downs Wind Farm Development Envelope in notification letter.
Native Title / Traditional Owners				
Nyiyaparli	10 May 2023	Meeting • Nyiyaparli Heritage Sub-Committee (HSC), and • Karlka Nyiyaparli Aboriginal Corporation (KNAC).	Introduction to proposed transmission line (PTP8) required to support the proposed Bonney Downs Wind project to the Nyiyaparli HSC. Overview of previous heritage surveys undertaken in the area was provide. Fortescue requested HSC to confirm if previous reports can be used for PTP8 project. Opportunity was also provided for on-ground consultation for the proposed infrastructure. KNAC requested confirmation that Fortescue has appropriate tenure in northern section of PTP alignment in Nyiyaparli country. KNAC requested confirmation that access to Sandy Creek is maintained.	Fortescue to provide due diligence assessment on PTP8 for KNAC to review use off previous surveys.
	9 Aug 2023	Meeting • Nyiyaparli Working Group, and • KNAC.	Introduction to proposed transmission line (PTP8) required to support the proposed Bonney Downs Wind project to the Nyiyaparli Working Group. Fortescue noted the transmission line would follow the existing Nullagine Mine Haul Road. The Project is in early phase with surveys, investigations and approvals still progressing.	Fortescue acknowledged on going consultation with Nyiyaparli will be required for heritage surveys and would continue to update as the project progresses.
	8 Nov 2023	Meeting • Nyiyaparli Working Group, and • KNAC.	Fortescue provided an update on the PTP8 transmission line required for Bonney Downs Wind project. Still progressing with investigations however, it was noted that some areas had already been heritage surveyed.	Fortescue agreed to provide an update on the status of decarbonisation projects (solar and wind) at the next working group meeting.

Stakeholder	Date	Engagement Type & List of Participants	Topics raised / Discussed	Response / Outcome
			KNAC raised questions regarding the use of previous heritage surveys for decarbonisation project requirements and requested further information on decarbonisation prioritisation within Fortescue. KNAC also raised questions about potential visual impacts of the Wind Farm and diminishing access to country and sought clarity from Fortescue on the prioritisation of engagements with regard to decarbonisation and mining projects.	
	9 Apr 2024	Meeting • Nyiyaparli Working Group, and • KNAC.	Fortescue provided an update on decarbonisation projects as requested from the November 2023 Working Group meeting. This included an update on all solar and transmission projects on Nyiyaparli country, including PTP8 associated with Bonney Downs. The Working Group (WG) raised concerns about whether camping grounds used by Nyiyaparli would be impacted and how could Fortescue ensure this wouldn't happen if consultation hasn't occurred.	Fortescue agreed to notify KNAC of any Nullagine Mine Haul Road closures during construction, ensuring continued access for KNAC representatives.
	17 Jul 2024	Meeting • Nyiyaparli Working Group, and • KNAC.	Fortescue provided further update on PTP8 noting that construction would aim to start in July 2025. Fortescue noted that heritage surveys have been commenced, and that on-ground consultation would occur for potential visual impacts from the proposed development, including Bonney Downs Wind farm.	Fortescue has included three viewpoints in the Visual Impact Assessment on Nyiyaparli Country, including one POI located north of Soda Springs.

Stakeholder	Date	Engagement Type & List of Participants	Topics raised / Discussed	Response / Outcome
			KNAC requested that a visual impact assessment be undertaken for the wind farm at Bonney Downs from Nyiyaparli Country.	
	17-18 Sept 2024	On-Country Consult • Nyiyaparli representatives, and • KNAC.	On-country social surrounds consultation for the Bonney Downs Wind Farm Project, including PTP8 transmission line. Consultation including Nyiyaparli representatives, KNAC staff and their consultants, and Fortescue subject-matter experts. Key objectives of this consult were to identify social and cultural values in the project area of importance to Nyiyaparli and understand any concerns Nyiyaparli may have regarding the proposed project. The trip also provided opportunity to provide an update on studies undertaken to date and proposed management strategies that will be implemented to avoid or minimise environmental impact. Nyiyaparli requested the proposed transmission line is kept to the western side of Nullagine Mine Haul Road. Nyiyaparli further requested that notification was provided (through KNAC) or any road closures along the Nullagine Mine Haul Road during construction as Nyiyaparli use this road to access the area for hunting. Nyiyaparli confirmed there were no concerns regarding visual impacts to cultural values from the PTP8 transmission line, or the proposed wind turbine locations being include the Nullagine Pilot Wind Project. However, Nyiyaparli requested inclusion of Soda Springs in the Visual Impact Assessment	Fortescue has designed the transmission line alignment to keep to the west of the Nullagne Mine Haul Road where practicable. Fortescue agreed to notify KNAC of any Nullagine Mine Haul Road closures during construction, ensuring continued access for KNAC representatives. Fortescue has included POI VIA_I a location approximately 2 km north of the boundary of Soda Springs in the VIA.

Stakeholder	Date	Engagement Type & List of Participants	Topics raised / Discussed	Response / Outcome
			(VIA) to understand potential visual impacts resulting from proposed wind turbines from the Bonney Downs Wind Farm Project, at this location.	
	9 Oct 2024	Meeting • Nyiyaparli HSC, and • KNAC.	Fortescue provided an update on heritage survey work for PTP8 noting all ethnographic and archaeological surveys have been completed.	No feedback from Nyiyaparli HSC.
	7 Nov 2024	Meeting • Nyiyaparli Working Group, and • KNAC.	Fortescue updated the WG on project details for PTP8 and confirmed that a social surrounds consultation was completed in September for PTP8 and the Bonney Downs Wind Project.	Consultation on the project will continue.
	1 Apr 2025	Meeting • Nyiyaparli Working Group, and • KNAC.	Fortescue updated the WG on project details for PTP8, including the MDCP for PTP8 and Nullagine Pilot Wind Project and the outcomes of the relevant social surrounds consultation undertaken in September 2024. KNAC queried the timeline for feedback on VIA images. Fortescue advised that images have been taken, and they will need to know which images to provide as soon as possible. Nyiyaparli requested an understanding of Nullagine Mine Haul Road closures for Bonney Downs wind farm and PTP8 construction activities. KNAC asked Fortescue to confirm if they had received the relevant reports for heritage surveys undertaken along the PTP8 alignment as Fortescue's slide outlines that all Heritage Places are avoided.	Fortescue agreed to notify KNAC of any Nullagine Mine Haul Road closures during construction, ensuring continued access for KNAC representatives. Fortescue confirmed that the relevant heritage survey reports had been received and were aware of 2 new heritage sites that were avoidable.
Palyku	2 Mar 2023	Meeting	Fortescue presented plans for decarbonisation and renewable energy projects across	Fortescue to provide further details of the project including windfarm location showing

Stakeholder	Date	Engagement Type & List of Participants	Topics raised / Discussed	Response / Outcome
		• Palyku Working Group, and • Palyku-Jartayi Aboriginal Corporation (PJAC).	Fortescue operations and within Palyku country. This included development of a wind farm. Four potential options being explored on Palyku country were presented. The WG requested more information on how Palyku can benefit from green energy projects and if these projects will be used to power communities. Fortescue further outlined to the need to measure wind levels to then understand what is possible for building a wind farm. Fortescue explained purpose of the met mast installation to collect this data and outlined that heritage and environmental surveys would occur to clear the area first. Fortescue is keen to discuss the heritage survey schedule for the project with PJAC and what this would look like.	creeks, stream flows, roads, turbines. This action was completed by the following Palyku WG meeting held on 9 March 2023.
	31 May 2023	Meeting • Palyku HSC, and • PJAC.	Fortescue presented five areas being considered for the proposed wind farm within Palyku country. Fortescue provided further details on the Met Mast and potential locations, noting that archaeological surveys has been completed over the preferred Met Mast location. Heritage surveys required for the remaining two Met Mast options were also presented.	PJAC to confirm suitable dates for Palyku monitors to be present for the Met Mast installation. Met Mast consultation ongoing.
	18 Jul 2023	Meeting • Palyku Working Group, and • PJAC.	Fortescue presented selected area for investigation for the proposed wind farm, this being Bonney Downs. Fortescue discussed various parts of the project area that are suitable for wind turbines, noting further	No specific outcomes in relation to Bonney Downs wind farm, although the WG requested further information on predicted mining energy usage versus decarbonisation energy production levels.

Stakeholder	Date	Engagement Type & List of Participants	Topics raised / Discussed	Response / Outcome
			investigations are needed to select the groupings. Fortescue provided further details on the Met Mast and potential locations, noting heritage surveys these areas had been completed and installation of the Met Mast was looking to commence in September 2023. An update on heritage and environmental surveys was also provided.	
	13 Oct 2023	Meeting • Palyku HSC, and • PJAC.	Fortescue provided an update on the proposed wind farm project including selected location being Bonney Downs and looking to include about 200 turbines being created. Fortescue confirmed installation of the met mast is in underway. Fortescue noted commencement of social surrounds consultation in 2024 for the proposed Bonney Downs project.	Fortescue commitment to undertake social soundings consultation, Traditional Ecological Knowledge (TEK) surveys, and other environmental studies such as Flora and Vegetation, Terrestrial Fauna, and Bird and Bat surveys. Fortescue to provide a full list of survey requirements for Palyku in 2024 calendar year.
	3 Nov 2023	Meeting • Palyku Working Group, and • PJAC.	Fortescue provided an overview of the decarbonisation targets and major projects currently proposed including introducing the Bonney Downs Wind Farm project to the WG. This included commencement of social surrounds consultation in 2024. PJAC advised that the impacts to the Seven Sisters heritage place should be avoided. Fortescue advised that they would be seeking to undertake a Cultural Constraints mapping trip to better understand the Bonney Downs project area and any highly sensitive heritage areas. Palyku requested further information on potential impacts to bird life as studies progress.	Fortescue committed to coordinate a meeting with PJAC to discuss the social surroundings process, including consultation requirements and expected outputs. Fortescue to provide examples of social surroundings from other NTGs. Fortescue to determine if proposed Bonney Downs wind farm can avoid Palyku #2 determination area. The WG advised of their preference for overhead powerlines over underground as they are less destructive to the land. Further request for Fortescue to consider exploring the option of putting powerlines on the ground in pipework.

Stakeholder	Date	Engagement Type & List of Participants	Topics raised / Discussed	Response / Outcome
	7 May 2024	Meeting • Palyku HSC, and • PJAC.	Fortescue provided a Decarb project overview.	No comments about Bonney Downs.
	8 May 2024	Meeting • Palyku Working Group, and • PJAC.	Fortescue provided an update on the Bonney Downs Wind Project. The WG noted that [Bonnie] creek through the BC Iron mining area has high cultural value. Fortescue advised that the wind project would avoid the creekline as much as possible but some road crossings with culverts may be required. The WG raised concerns about culverts and the potential impacts. Fortescue advised that the Nullagine Camp would be reopened for the project. PJAC asked about construction materials. Fortescue confirmed that materials would be shipped to Port Hedland and transported via road train to the site. Some road upgrades would be required, however no sealed roads were planned at present.	Fortescue committed to advise PJAC of any proposed shire road upgrades (Hillside-Woodstock and Hillside-Bonney Downs roads) including any tenure requirements once known, and the impact on access roads for the public. Fortescue confirmed an 8-week review period would be provided for PJAC to review major approval submissions and offered to pay for an independent consultant if required.
	24 – 28 Jun 2024	On site consult • Palyku representatives, • PJAC, and • Terra Rosa.	First social surrounds consultation for proposed Bonney Downs Wind Project (2024_PAL_SSC_Trip2). Consult included presentations on Social Surroundings Factor, project details, approvals strategy and timeline, and status of social surroundings studies to date. Field visits were undertaken at the direction of Palyku and included helicopter flights over the proposed turbine, transmission line and associate infrastructure footprint; a visit to old	Palyku consider the wind project will have significant impact on the cultural values of Bonnie Pool, mesas and other places of significance in the cultural landscape. As a result of the social surrounds trip, Palyku requested: • Subsequent on-country consultation between PJAC Board and Elders,

Stakeholder	Date	Engagement Type & List of Participants	Topics raised / Discussed	Response / Outcome
			BC Iron Mine; a visit to Bonnie Pool; and driving the alignment of the proposed PTP8 transmission line following BC Iron Rd to Palyku's native title boundary. During the trip, Palyku raised concerns about potential visual impacts of the wind turbines on the cultural landscape for Palyku and other groups who live locally and travel along Marble Bar Rd to and from Nullagine. Concerns regarding potential impacts to water ways and catchment flows, groundwater levels and quality, and impacts to birds' flight patterns were also discussed.	• Fortescue to consider the use of augmented reality to consult on potential visual impacts, • Continued access to Bonnie Pool and Fortescue to maintain an access road to the pool, and • Avoid crossing creeks if possible, otherwise design the project to minimise the number of creek crossings. Fortescue will continue investigations and studies to address the above outcomes of the social surrounds trip and continue consultation with Palyku and PJAC on the project.
	19 Jul 2024	Email PJAC	PJAC advise all SSC and TEK trips to be put on hold until further notice, due to limited capacity of heritage team and Palyku representatives, and preferred consultancy, to undertake surveys and consults to agreed schedule. PJAC also requested more engagement on the design of social surrounds consultation.	Fortescue acknowledged request and postponed survey/consultation trips until further notice. PJAC to provide dates for meeting to discuss consultation framework for social surrounds trips.
	24 Jul 2024	Email PJAC	PJAC requested workshop with Fortescue and PJAC's consultants to discuss the social surroundings and the consultation process.	Workshop and meeting proposed for 2 Aug 2024.
	2 Aug 2024	Meeting • PJAC, and • Terra Rosa Consulting (Terra Rosa).	Workshop held with PJAC, their consultant, and Fortescue to discuss the social surrounds consultation process and concerns raised by Palyku during Bonney Trip 1 (2024_PAL_SSC_Trip2). The workshop addressed the ongoing nature of social surrounds consultation and that there will be more opportunities for Palyku to provide	It was acknowledged by all parties this is an ongoing consultation process and further information about the project would be provided at subsequent consults. PJAC requested opportunity to review presentation materials prior to social surrounds trips to better inform the Palyku representatives that will be attending on the

Stakeholder	Date	Engagement Type & List of Participants	Topics raised / Discussed	Response / Outcome
			feedback on the proposed activities. It was also noted that the purpose of the first trip was to document Palyku's concerns on a range of social surroundings values such as access and use of country, culturally significant plants and animals, and other concerns about the project. This information will inform the studies and assessments Fortescue will undertake to address Palyku's concerns and present these at future consultation.	objectives of the trip. Fortescue agreed to schedule pre-survey meetings to review presentation materials. PJAC also requested more information on the location of the wind turbines and whether alternative locations were considered.
	20 Sep 2024	Email • PJAC.	PJAC advised that 2024_PAL_SSC_Trip4 (Bonney Trip 2) rescheduled for 1 – 4 Oct 2024 to be cancelled / rescheduled again, due to availability of Palyku representatives.	Fortescue acknowledged cancellation and noted the trip dates proposed for November 2024, would become 2024_PAL_SSC_Trip4 (Bonney Trip 2).
	26 Sept 2024	Meeting • Palyku Working Group, and • PJAC.	Fortescue provided an update on the proposed Bonney Downs Wind project, including details of the project activities that were presented during the social surrounds consult in June 2024. Fortescue noted the project layout will be redesigned to avoid culturally sensitive mesas. An update on the ongoing research on the bird and bat studies in collaboration with Murdoch Uni and requirements for road updates to transport turbine blades was also provided. The WG raised concern about traffic and safety while transporting the blades on public roads and the potential for unauthorised personnel accessing sensitive cultural areas.	Fortescue agreed to Palyku monitors being present for ground clearing activities for the Bonney Downs project and for the road upgrades. Further consultation is required between Fortescue and Palyku regarding concerns over the use of Hillside-Bonney Downs Road.
	11 Oct 2024	Meeting • Palyku HSC, and • PJAC.	Fortescue provided an update on heritage surveys and social surrounds consultation conducted to date for the Bonney Downs project. The update included ongoing studies and investigations being undertaken to address	The WG requested consideration for the PJAC directors to be onsite for social surrounds consultation, and providing opportunity for larger numbers to attend. Fortescue to continue surveys and collaboration with Palyku to progress and

Stakeholder	Date	Engagement Type & List of Participants	Topics raised / Discussed	Response / Outcome
			the concerns raised to date by Palyku during consultation.	minimise concerns relating to the project development.
	31 March – 3 April 2025	On site consult • Palyku representatives, • PJAC, and • Terra Rosa.	Second social surrounds consultation for proposed Bonney Downs Wind Project (2025_PAL_SSC_Trip1). The consult included updates on the project design to address concerns raised by Palyku on previous consultations, present the outcomes of completed studies, and inform Palyku of management actions to be included in the ERD prior to receiving the draft for review. Field visits were undertaken to Bonnie Creek, Bonnie Pool, and various locations to view augmented reality images of the proposed Wind Turbines as part of the Visual Impact Assessment (VIA). During the trip, Palyku raised concerns about access to hunting areas; possible disturbance of traditional food sources due to noise impacts; expressed their presence for minimising creek crossings with the understanding that that would increase total disturbance; and to minimise disturbance of water in the landscape.	As a result of the social surrounds trip, Palyku requested ongoing consultation with the PJAC board and suggested a visit to a working wind farm. • To manage impacts to waterflow, Palyku requested Fortescue not place poles within creeks and creek crossings to be either low level floodways or box style culverts. • During the consultation, Fortescue confirmed continued access to Bonnie Pool would be maintained and that TEK surveys will be undertaken. Fortescue will continue investigations and studies to address concerns raised during the social surrounds trip and continue consultation with Palyku and PJAC on the project.
	21 – 22 May 2025	Meeting • Palyku HSC, • Palyku Working Group, and • PJAC.	Fortescue provided a project update on Bonney Downs Wind Farm and PTP8, noting the completion of geotechnical investigations and commencement of early works. This update also provided information regarding the status of relevant Approvals including environmental approvals (NVCP and Mining Proposal/Closure Plan) and Heritage approvals (survey works). An overview of the project technical details and milestones with a timeline was also presented	Fortescue noted that PJAC is provided the same opportunity to input into ERD applications as other Native Title Parties. Fortescue clarified that there was no intention to restrict access and acknowledged the firm decision regarding the project location. Fortescue committed to maintaining transparency and providing

Stakeholder	Date	Engagement Type & List of Participants	Topics raised / Discussed	Response / Outcome
			with an approvals overview for Bonney Downs project. Lastly, Fortescue outlined the outcomes from the Social Surrounds Consultation undertaken to date, with the most recent trip occurring 31 March – 3 April 2025 (Trip 2) PJAC queried the process around the ERD submission and if they will be provided the same input as other Native Title Parties with similar submissions. PJAC raised concerns to the proposed project location, specifically regarding traditional activities such as hunting and pastoral operations. PJAC noted the proposed mitigation measures to specific values do not adequately address the potential loss of cultural heritage and intergenerational connection to the land. PJAC noted that the initial understanding of the project was limited, and subsequent information has revealed a more significant impact than originally anticipated.	ongoing updates to the PJAC Working Group. Fortescue noted that feedback from cultural and environmental surveys and Working Group meetings has been incorporated into the project design to minimise impacts where possible.
	20 – 21 August 2025	Meeting – Working Group (Day 1) and ERD review workshop (Day2) Palyku Working Group, and Palyku-Jartayi Aboriginal Corporation (PJAC).	Fortescue noted that PJAC had been provided with an early version of the ERD document and sought comments from the Board and formal response from PJAC. Board members had various questions about the project, and requested further advice to be provided at the subsequent working group meeting, including: - Carbon credits and the financial benefit of decarbonisation. Project Manager (PM) agreed to provide this.	PJAC will provide response to ERD review formally to Fortescue on 22 August 2025. Fortescue representatives agreed to provide advice on each of the points raised by Palyku representatives at the subsequent Working Group meeting.

Stakeholder	Date	Engagement Type & List of Participants	Topics raised / Discussed	Response / Outcome
			- How the base of the turbines will be secured to ensure unauthorised entry will be managed. PM to provide this. - What environmental monitoring will be undertaken through the project life. Manager Primary Environmental Approvals to provide. - Opportunities to fund a Palyku Ranger team to support works in the BD area. First Nations Team to advise on process and considerations for funding.	
	25 August 2025	Response to draft ERD which was provided to Palyku for comment.	Fortescue provided the ERD draft for comment ahead of submission.	PJAC provided commentary on aspects of the studies and concerns of interest to their people.
	19 November 2025	Meeting – Working Group Palyku Working Group, and Palyku-Jartayi Aboriginal Corporation (PJAC).	Fortescue presented on the approvals timelines, options to paint blades to mitigate bird strikes, survey requirements for 2026 for Bonney Downs footprint, southern turbine placement considerations, new met mast location proposed, layout of revised turbine locations, timeline and information about future environmental surveys and key construction activities planned.	The Palyku Working Group queried Fortescue's management of wind farm waste (including the disposal of damaged blades). Fortescue agreed to providing a waste management plan for wind farm waste (including specific components). The Palyku Working Group noted the painted blades would not mitigate bird strikes at night. Fortescue advised that additional measures are being considered to mitigate nighttime impacts, including the use of noise. The Palyku Working Group raised concerns around potential community impact if noise mitigation measures are installed. Fortescue confirmed that studies are undertaken to understand possible noise impacts on communities.

Stakeholder	Date	Engagement Type & List of Participants	Topics raised / Discussed	Response / Outcome
				PJAC noted a substantial portion of the revised turbine layout falls outside of ethnographic surveyed area and as such, could not provide comment on the revised layout. PJAC queried the suitability of historical social surrounds consultation / studies given the revision of the design. Fortescue noted historical consultation / studies were undertaken on a 'worst case' scenario but will confirm whether further social surroundings consultation / studies are required for areas where design has altered.

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5 OBJECTIVES AND PRINCIPLES OF THE EP ACT

The EP Act has five core principles of environmental protection, which align with the principles of Ecologically Sustainable Development outlined in section 3A of the EPBC Act. Table 5-1 describes how each of the five principles of the EP Act have been applied to the Proposal.

Table 5-1: Principles of Environmental Protection

Principle	Consideration of principle
1. The precautionary principle Where there are threats of serious irreversible damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. In the application of the precautionary principle, decisions should be guided by: • Careful evaluation to avoid, where practicable, serious or irreversible damage to the environment, and • An assessment of the risk-weighted consequences of various options.	A comprehensive desktop survey and field studies were undertaken within the DE to assess the impact of the Proposal. Studies included: • Flora and Vegetation, • Terrestrial fauna, including subterranean fauna, • Bird and Bat Monitoring, • Traditional Ecological Knowledge surveys, • Heritage surveys, • Noise and Vibration Assessment, • Visual impact assessment, • Dust assessment, • Hydrological and hydrogeological assessment, and • Soil and landform assessment. These scientific studies were used to identify the potential impacts of each Key Environmental Factor. Once identified, avoidance and mitigation measures were proposed to ensure these impacts are environmentally acceptable. If additional studies are completed, mitigations and management measures will be further refined. As described in Section 3.1.2, alternatives to the Proposal were considered including the Proposal location and the type of renewable project. Based on this options analysis, the Proposal was deemed the most suitable option to progress.
2. The principle of intergenerational equity The present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations.	The Proposal is for a renewable energy development that has the potential to significantly reduce the reliance on fossil fuel power for Fortescue's critical mineral operations, reducing greenhouse gas emissions and resulting in associated beneficial climate change impacts. The Proposal will allow Fortescue to cut down Scope 1 and Scope 2 emissions from its operations by at least 1.5 million TCO_2-e per year by replacing diesel and gas-fired stationery power generation with renewable sources. The proposal will also make a sustained contribution to WA's economy through provision of jobs and long-term clean energy. The Proposal will ensure the health, diversity and productivity of the environment is maintained by retaining as much habitat as possible and by minimising environmental impacts where practicable. The anticipated intergenerational benefits could be delivered ensuring no more than 1.01% of the vegetation within the DE is lost, including avoidance or

Principle	Consideration of principle
	effective mitigation of impacts on species of conservation significance.
3. The principle of the conservation of biological diversity and ecological integrity Conservation of biological diversity and ecological integration should be a fundamental consideration.	The Proposal meets the principle of conservation of biological diversity and ecological integrity by reducing the clearing of native vegetation within the DE, where practicable. Additionally, as discussed above the Proposal will reduce greenhouse gas emissions, contributing to the protection of biodiversity from the impacts of global warming. Lastly, Fortescue in partnership with the Harry Butler Institute, Murdoch University are developing a research programme to understand the potential impacts to avian and bat fauna from wind generation projects.
4. Principles relating to improved valuation, pricing, and incentive mechanisms • Environmental factors should be included in the valuation of assets and services. • The polluter pays principle – those who generate pollution and waste should bear the cost of containment, avoidance or abatement. • The users of goods and services should pay prices based on the full life cycle costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any waste. • Environmental goals, having been established, should be pursued in the most cost-effective way, by establishing incentive structures, including market mechanisms, which benefit and/or minimise costs to develop their own solutions and responses to environmental problems.	The proponent acknowledges the need for improved valuation, pricing and incentive mechanisms and has aimed to pursue these principles when appropriate. For example: • Environmental factors were considered to determine the location of the IDF, including avoidance of high value areas (as discussed further in Chapters 0 to 10). • By its nature, the Proposal will not generate intractable or large volume waste streams, with hydrocarbon and putrescible wastes management during construction and operations being the key considerations, which can be readily contained and managed through standard practices, and • The cost of eventual decommissioning and rehabilitation has been incorporated into the financial modelling for the Proposal.
5. The principle of waste minimisation All reasonable and practicable measures should be taken to minimise the generation of waste and its discharge into the environment.	Waste management will be addressed during construction and operation activities to avoid and reduce waste, reuse and recycle where practicable, and treat and/or dispose in accordance with regulated requirements.

6 ENVIRONMENTAL FACTORS AND OBJECTIVES

The EPA environmental factors and objectives, and their relevance to the Proposal are provided in Table 6-1.

Table 6-1: Identification of Preliminary Key Environmental Factors

Factor	Objective	Relevance to Proposal	Key factor
Sea			
Benthic Communities and Habitats	To protect benthic communities and habitats so that biological diversity and ecological integrity are maintained.	No credible pathway – the DE is not located in or close to the marine environment.	No
Coastal Processes	To maintain the geophysical processes that shape coastal morphology so that the environmental values of the coast are protected.		
Marine Environmental Quality	To maintain the quality of water, sediment and biota so that environmental values are protected.		
Marine Fauna	To protect marine fauna so that biological diversity and ecological integrity are maintained.		
Land			
Flora and Vegetation	To protect flora and vegetation so that biological diversity and ecological integrity are maintained.	Credible pathway – the Proposal will involve the clearing of up to 910.26 ha of native vegetation.	Yes
Terrestrial Fauna	To protect terrestrial fauna so that biological diversity and ecological integrity are maintained.	Credible pathway – the Proposal will involve the clearing of up to 910.26 ha of fauna habitat.	Yes
Subterranean Fauna	To protect subterranean fauna so that biological diversity and ecological integrity are maintained.	Managed under alternative approval regime – Water abstraction for construction and operation will be undertaken in accordance with an existing 5C licence to take water under the RIWI Act (GWL171278(7)). Significant impacts are not considered likely as a result of activities within this Proposal.	No

Factor	Objective	Relevance to Proposal	Key factor
Landforms	To maintain the variety and integrity of significant physical landforms so that environmental values are protected.	Credible pathway – the DE contains mesas and is within the same catchment as the Fortescue Marsh, which are both considered to be important landforms. Additionally, the Proposal will require clearing of the Lower Hamersley group geological unit, characterised by Banded Iron Formations, subterranean fauna habitat, short-range endemic (SRE) habitat and result in visual changes to the landscape. However, through preliminary assessment and analysis, significant impacts are not considered likely, and this factor has been covered in Chapter 10.3 (Other Environmental Factors).	No
Terrestrial Environmental Quality	To maintain the quality of land and soils so that environmental values are protected.	Credible pathway – Potential of disturbing ASS, land erosion and contamination of soil (including potential contamination associated with water pipeline failure, application of water to roads or irrigation of treated wastewater). Significant impacts are not considered likely due to the fact the foundations for the wind turbines and supporting infrastructure will be relatively shallow (approximately 4 m but up to 35 m for some of the narrower bores), and the sporadic nature of any foundations. Through preliminary assessment and analysis, significant impacts are not considered likely, and this factor has been covered in Chapter 10.2 (Other Environmental Factors).	No
Water			
Inland Waters	To maintain the hydrological regimes and quality of groundwater and surface water so that environmental values are protected.	**Surface Water** Credible pathway – The DE is within the same catchment as the Fortescue Marsh, and the Proposal also requires construction of watercourse crossings. It should be noted that the turbines and associated infrastructure are located approximately 29 km from the Fortescue Marsh and Christmas Creek mine is located between the DE and the Fortescue Marsh. Significant impacts are not considered likely, and this factor has	No

Factor	Objective	Relevance to Proposal	Key factor
		been covered in Chapter 10.1 (Other Environmental Factors). **Groundwater** Managed under alternative approval regime – Water abstraction for construction and operation will be undertaken in accordance with the existing 5C licence to take water (GWL171278(7). Significant impacts are not considered likely as a result of activities within this Proposal. This factor has been covered in Chapter 10.1 (Other Environmental Factors).	
Air			
Air Quality	To maintain air quality and minimise emissions so that environmental values are protected.	No credible pathway – construction of the Proposal will require up to 4 MW of instantaneous load, which is likely to be provided by diesel electricity generation infrastructure. The Proposal is not anticipated to effect local or regional air quality and operationally will decarbonise existing energy supply. Remote location with limited sensitive receptors nearby.	No
Greenhouse Gas Emissions	To reduce net greenhouse gas emissions in order to minimise the risk of environmental harm associated with climate change	Does not exceed guideline threshold (EPA, 2023d) – Construction or operational activities not anticipated to exceed the threshold of 100,000 tonnes CO_2-e per year for scope 1 or 2 emissions.	No
People			
Social Surroundings	To protect social surroundings from significant harm.	Credible pathway – the Proposal will have a visual impact, will result in an increase in noise, dust and vibration and will result in the clearing of plants and animals species of traditional value and crossing of several waterways of significance to Traditional Owners and pastoralism.	Yes
Human Health	To protect human health from significant harm.	No credible pathway – the Proposal does not involve a radiation source or emissions of radiation.	No

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7 FLORA AND VEGETATION

7.1 EPA Objective

The WA EPA objective for the flora and vegetation environmental factor is '*To protect flora and vegetation so that biological diversity and ecological integrity are maintained*' (EPA, 2016b).

The WA EPA defines flora as '*native vascular plants*', and vegetation as '*groupings of different flora patterned across the landscape that occur in response to environmental conditions*' (EPA, 2016b).

7.2 Policy and Guidance

The following EPA policies and guidelines have been considered during the preparation of this ERD and the supporting technical studies:

- Environmental Guidance for Planning and Development. Guidance Statement No. 33. Government of WA (EPA, 2008),
- Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment (EPA, 2016a),
- Environmental Factor Guideline – Flora and Vegetation (EPA, 2016b),
- Statement of Environmental Principles, Factors and Objectives (EPA, 2023a), and
- Instructions – How to Prepare an Environmental Review Document (EPA, 2024).

The Environmental Factor Guideline has been considered during the identification of flora and vegetation values within the DE. The issues identified in the guideline have been considered in relation to potential impacts from the Proposal.

Flora and vegetation surveys for the Proposal have been planned and executed in accordance with the EPA's technical guidance for this factor. Any survey limitations relative to the technical guidance are noted in the flora and vegetation survey report (ecologia, 2025a).

Other policy and guidance considered during the preparation of this ERD and the supporting technical studies includes:

- BC Act,
- *Biosecurity Agriculture and Management Act 2007* (BAM Act),
- A guide to the assessment of applications to clear native vegetation, under Part V Division 2 of the *Environmental Protection Act 1986* (DER, 2014),
- 'Conserving Threatened Ecological Communities' (Publicly available brochure prepared by the Department of Environment and Conservation in conjunction with National Heritage Trust: Perth, WA) (DEC, 2007),

- National Objectives and Targets for Biodiversity Conservation 2001-2005. (Canberra) (Commonwealth of Australia (CoA), 2001), and

- Environmental Protection (Environmentally Sensitive Areas) Notice 2005. West. Aust. Gov. Gaz. 1163–1166 (State of WA, 2005).

7.3 Studies and Surveys

Detailed flora and vegetation surveys have been completed within the DE and surrounding area to determine baseline environment and inform the design of the Proposal. These surveys are presented in Table 7-1. The total Survey Area is approximately 108,841 ha, while the DE comprises 89,973.86 ha within the Survey Area.

Table 7-1: Flora and Vegetation Studies and Surveys

Report	Survey Timing	Survey Effort
Bonney Downs East Detailed Flora and Vegetation Survey (SLR, 2024); incorporated to IBSA-2025-0268	• Installation of sites, mapping and targeted searching: 10th – 18th May 2023. • Re-visiting sites, installing new sites, additional mapping and targeted searching: 29th July – 5th August 2023.	• Bonney Downs East survey area: 31,789.79 ha. • Desktop assessment to evaluate biological values of the survey area and surrounds, including a review of existing physical and biological values, significant species and communities, and other relevant available data. • A detailed flora and vegetation survey and targeted flora assessment in accordance with EPA Technical Guidance: Flora and Vegetation Surveys for Environmental Impact Assessment (EPA, 2016a). • Quadrat and relevé locations were selected using a combination of aerial photography, topographic features, land system mapping, pre-European vegetation and field observation. At least three sites were chosen to represent each potentially distinct plant community, where possible. Flora within sampling sites were recorded with additional observations recorded opportunistically outside of the sampling sites. Targeted searches for Threatened and Priority flora species and ecological communities were conducted in areas of suitable habitat. Vegetation type and condition were assessed through aerial photography, taxonomic identification and multivariate analysis. • The vegetation dataset consisted of 109 quadrats and relevés.
Bonney Downs North Detailed Flora and Vegetation Assessment (ecologia, 2024); incorporated to IBSA-2025-0268 Bonney Downs Consolidated Flora and Vegetation Assessment (ecologia, 2025a); IBSA-2025-0268	• Bonney Downs North: 19th – 26th June and 13th – 20th September 2023 (ecologia, 2024). • The remainder of the survey area (excluding Bonney Downs East): 5th – 13th March and 15th – 21st July 2024 (ecologia, 2025a).	• ecologia surveyed the Bonney Downs North survey area and the remainder of the consolidated Survey Area. The results are presented in ecologia (2025a). This survey area is approximately 77,051 ha. • Desktop assessment to evaluate biological values of the survey area and surrounds, including a review of existing physical and biological values, significant species and communities, and other relevant available data. • A two-phase detailed flora and vegetation survey and targeted flora assessment in accordance with EPA Technical Guidance: Flora and Vegetation Surveys for Environmental Impact Assessment (EPA, 2016a). • Quadrat and relevé locations were selected using a combination of aerial photography, topographic features, land system mapping, pre-European vegetation and field observation. At least three sites were chosen to represent each potentially distinct plant community, where possible. Flora within sampling sites were recorded with additional observations recorded opportunistically outside of the sampling sites. Targeted searches for Threatened and Priority flora species and ecological communities were conducted in areas of suitable habitat.

Report	Survey Timing	Survey Effort
		Vegetation type and condition were assessed through aerial photography, taxonomic identification and multivariate analysis. • The ecologia (2025a) vegetation dataset consisted of 291 quadrats and relevés.

7.3.1 Limitations

No significant limitations were identified during the SLR, ecologia (2024) or ecologia (2025a) surveys. See Appendix A for a description of the minor limitations of the flora and vegetation surveys.

7.4 Receiving Environment

7.4.1 Regional Vegetation

The Proposal is located within the Chichester subregion (PIL1) and Fortescue subregion (PIL02) of the Pilbara Bioregion, as defined by IBRA. The Chichester subregion (PIL1) is described by Kendrick and Mckenzie (2001) as “undulating Archaean granite and basalt plains include significant areas of basaltic ranges”. The vegetation within this subregion consists of shrub steppe characterised by *Acacia inaequilatera* over *Triodia wiseana* (formerly known as *Triodia pungens*) hummock grasslands, with *Eucalyptus leucophloia* tree steppes on ranges. Land use within the subregion includes grazing, native pasture, conservation, urban and mining (Kendrick & Mckenzie, 2001).

The Fortescue subregion (PIL2) is described by Kendrick (2001) as “Alluvial plains and river frontage”. Extensive salt marsh, mulga-bunch grass, and short grass communities on alluvial plains occur in the east. Deeply incised gorge systems occur in the western (lower) part of the subregion. River gum woodlands fringe the drainage lines. This subregion is noted as being the northern limit of Mulga (*Acacia aneura*). The Millstream aquifer, an extensive calcrete aquifer (originating within a palaeo-drainage valley), lies between the Chichester and Hamersley Ranges and feeds numerous permanent springs in the central Fortescue, supporting large permanent wetlands with extensive stands of river gum and Cadjeput (*Melaleuca*) woodlands. The Fortescue Marsh is the key feature of the subregion within the local area of the Proposal. Land use within the subregion includes grazing, native pasture, unallocated crown land and crown reserves, conservation and Aboriginal land (Kendrick, 2001).

7.4.2 Pre-European Vegetation

Pre-European vegetation mapping based on Beard (2013) describes the remaining extent of five vegetation associations within the DE. The DE is mostly composed of vegetation association 173 (98.34%), which overlaps the Chichester and Fortescue subregions. The remainder of the DE is comprised of vegetation associations 18, 29, 93 and 562. All other vegetation associations each represent less than 1.0% of the DE (Table 7-2). All vegetation associations present within the DE have over 99% extent remaining across both subregions (Table 7-2;Figure 7-1).

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Table 7-2: Pre-European Vegetation Associations within the Development Envelope (Source: Dataset - DPRID, 2019; Statistics - GoWA, 2019)

Vegetation associations		Context	Pre-European extent (ha)	Extent remaining (ha)	Extent remaining (%)[3]	Current extent in DBCA managed lands (%)	Area in DE (ha)	Proportion of DE (%)
18	Mulga *Acacia aneura* and associated species.	Western Australia	19,892,306.46	19,843,148.07	99.75	6.64	617.52	0.69%
		Pilbara IBRA Region	676,556.72	671,843.35	99.30	25.35		
		Chichester IBRA Sub-Region	30,183.37	30,179.94	99.99	-		
		Fortescue IBRA Sub-Region	65,127.27	65,121.71	99.99	-		
		Shire of East Pilbara	359,372.12	355,446.47	98.91	1.49		
29	Mulga *Acacia aneura* and associated species.	Western Australia	7,903,991.45	7,898,973.24	99.94	6.28	4.84	0.01%
		Pilbara IBRA Region	1,133,219.76	1,131,712.01	99.87	9.39		
		Chichester IBRA Sub-Region	62,506.95	62,506.95	100.00	-		
		Fortescue IBRA Sub-Region	893,394.62	893,221.87	99.98	9.41		
		Shire of East Pilbara	906,243.49	905,848.35	99.96	7.74		
93	Hummock grassland with scattered shrubs or mallee *Triodia* spp. *Acacia* spp., *Grevillea* spp. *Eucalyptus* spp	Western Australia	3,044,309.52	3,040,640.98	99.88	1.96	4.84	0.01%
		Pilbara IBRA Region	3,042,114.27	3,038,471.67	99.88	1.96		
		Chichester IBRA Sub-Region	2,940,348.04	2,936,731.54	99.88	2.03		
		Fortescue IBRA Sub-Region	5.21	5.21	100.00	-		
		Shire of East Pilbara	1,709,522.24	1,706,780.57	99.84	2.70		
173	Hummock grassland with scattered shrubs or mallee *Triodia* spp.	Western Australia	1,753,104.09	1,748,260.83	99.72	13.65	88,484.38	98.34%
		Pilbara IBRA Region	1,752,520.89	1,747,677.63	99.72	13.66		
		Chichester IBRA Sub-Region	1,744,029.51	1,739,189.58	99.72	13.73		

[3] The extent remaining vegetation was based on the 2018 Statewide Vegetation Statistics (DBCA, 2019), which contains data of 2018, thus it might be out of date.

Vegetation associations		Context	Pre-European extent (ha)	Extent remaining (ha)	Extent remaining (%)[3]	Current extent in DBCA managed lands (%)	Area in DE (ha)	Proportion of DE (%)
	Acacia spp., *Grevillea* spp. *Eucalyptus* spp	Fortescue IBRA sub-Region	4,310.96	4,310.96	100.00	-		
		Shire of East Pilbara	1,085,704.89	1,081,937.46	99.65	9.93		
562	Hummock grassland with scattered bloodwoods & snappy gum *Triodia* spp., *Corymbia dichromophloia*, *Eucalyptus leucophloia*	Western Australia	103,606.82	103,606.82	100.00	3.34	862.28	0.96%
		Pilbara IBRA Region	103,606.82	103,606.82	100.00	3.34		
		Chichester IBRA Sub-Region	3,883.61	3,883.61	100.00	-		
		Fortescue IBRA Sub-Region	99,723.21	99,723.21	100.00	3.47		
		Shire of East Pilbara	38,534.42	38,534.42	100.00	1.17		

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Legend

- Development Envelope
- GOV Towns
- Major Roads
- Fortescue Rail
- Roy Hill Rail
- Indicative Disturbance Footprint
- Approved Disturbance (Nullagine Pilot Wind Farm)

Pre-European Vegetation Associations

- 18
- 29
- 93
- 173
- 562

Data Source(s):
Aerial, Fortescue and ESRI
All other data, Fortescue, 2025

N

0 2 4 6 8 10
Kilometers

Figure 7-1
Pre-European Vegetation
within the Development Envelope

Requested By: R. Dorji	Date: 1/28/2026
Drawn By: R. Kerr	Size: A4L
Revised By: rykerr	Revision: 1
Approved By:	Confidentiality: 0
Scale: 1:300,000	
Coordinate System: GDA 1994 MGA Zone 50	
Project Name: 4519OP002_MP_EN_0093_PartIV	
Document Name: 4519OP002_MP_EN_0093_007_r1_Pre_Euro	

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7.4.3 Vegetation Types

Fifteen vegetation types were identified within the DE based on floristic, cluster analysis and statistical results. Three similar *Acacia inaequilatera* dominated vegetation types (AiCpTe1, AiCpTe2, and AiSgTb) were mapped as a mosaic unit as they could not be consistently distinguished using aerial imagery. This area is referred as 'Mosaic (Mos)' and covers 56,633.25 ha, which represents most of the DE (62.94%).

Table 7-3 and Figure 7-2 details the vegetation types, general vegetation condition, and extent within the DE. Plate 7-1 to Plate 7-4 shows the vegetation types within the DE.

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Table 7-3: Vegetation Type Descriptions within the Development Envelope

Landform and Soils	Vegetation Types	Vegetation Type Description	General Vegetation Condition	Area within DE (ha)	Proportion of DE (%)
Gravelly plains and undulating plains with reddish-brown clay-loam soils.	AaCpTw	*Acacia tall open shrubland* *Acacia aptaneura*, *Acacia tetragonophylla* tall open shrubland; *Corchorus parviflorus* low open shrubland; *Triodia wiseana*, *Enneapogon polyphyllus*, *Aristida contorta* low open tussock grassland.	Excellent	346.19	0.38%
Gravelly plains and undulating plains with reddish-brown clay-loam soils.	AaEp	*Acacia tall open shrubland* *Acacia aptaneura*, *Acacia pruinocarpa* tall open shrubland; *Enneapogon polyphyllus*, ±*Triodia brizoides*, ±*Triodia longiceps* low open tussock/hummock grassland.	Degraded to Excellent	467.21	0.52%
Primary stony plains with red-brown clay-loam soils.	AaTe	*Acacia tall open shrubland* *Acacia aptaneura*, *Acacia pruinocarpa*, *Acacia bivenosa* tall open shrubland; *Triodia epactia* low open hummock grassland.	Excellent	589.26	0.65%
Plains and undulating plains	AaTs	*Acacia tall open shrubland* *Acacia ancistrocarpa*, *Acacia aptaneura* tall open shrubland; *Triodia scintillans* low hummock grassland.	Excellent	400.81	0.45%
Rocky creeks and minor gullies.	AcTe	*Acacia tall sparse shrubland* *Acacia cyperophylla* var. *omearana* (P1), *Acacia tumida* var. *pilbarensis* tall sparse shrubland; *Triodia epactia*, *Triodia longiceps* mid sparse hummock grassland.	Very Good to Excellent	163.89	0.18%
Plains and undulating plains.	AeTe	*Triodia low hummock grassland* *Acacia eriopoda* tall sparse shrubland; *Triodia epactia*, *Triodia longiceps* low hummock grassland.	Excellent	66.42	0.07%
Drainage lines and floodplains.	AmTe	*Acacia tall closed shrubland* *Acacia monticola* tall closed shrubland; *Triodia epactia* low open hummock grassland.	Excellent	86.79	0.10%

Landform and Soils	Vegetation Types	Vegetation Type Description	General Vegetation Condition	Area within DE (ha)	Proportion of DE (%)
Sandy creek.	EcAcCs	*Eucalyptus mid open woodland* *Eucalyptus camaldulensis* subsp. *refulgens, ±Melaleuca argentea* mid open woodland; *Acacia coriacea* subsp. *pendens*, *Acacia trachycarpa* tall open shrubland; **Cenchrus setiger*, *Triodia longiceps* low tussock/hummock grassland.	Degraded to Excellent	88.27	0.10%
Low stony hills, plains, and undulating plains sometimes with dissecting drainage lines. Often with quartz and calcrete. Reddish brown clay-loam.	ElAbTl	*Eucalyptus low open woodland* *Eucalyptus leucophloia* subsp. *leucophloia*, *±Corymbia hamersleyana* low open woodland; *Acacia bivenosa* mid sparse shrubland; *Triodia longiceps*, *Triodia wiseana*, *±Triodia brizoides* low hummock grassland.	Very Good to Excellent	15,183.93	16.88%
Low rocky hills and ridges with red-brown clay-loam soil	ElGwTe	*Triodia low hummock grassland* *Eucalyptus leucophloia* subsp. *leucophloia*, *±Corymbia hamersleyana* low open woodland; *Grevillea wickhamii* mid sparse shrubland; *Triodia epactia*, *Eriachne lanata*, *Eriachne mucronata* low hummock/tussock grassland.	Excellent	4,033.24	4.48%
Minor and major creeks and minor gullies.	EvAcCc	*Eucalyptus mid open woodland* *Eucalyptus victrix*, *±Eucalyptus camaldulensis* subsp. *refulgens* mid open woodland; *Acacia coriacea* subsp. *pendens*, *Acacia pyrifolia* var. *pyrifolia*, *Atalaya hemiglauca* tall open shrubland; **Cenchrus ciliaris*, *Triodia longiceps*, *Triodia epactia* low tussock/hummock grassland.	Degraded to Excellent	4,260.76	4.74%
Low hills and plains with clay soils, often stony.	VfAl	*Aristida low tussock grassland* **Vachellia farnesiana* mid sparse shrubland; *Aristida latifolia*, *Cynodon convergens, Eriachne mucronata* low tussock grassland.	Poor to Excellent	6,809.26	7.57%

Landform and Soils	Vegetation Types	Vegetation Type Description	General Vegetation Condition	Area within DE (ha)	Proportion of DE (%)
AiCpTe1: Low stony hills and undulating plains. Mostly ironstone and basalt with some quartz and calcrete. Reddish brown clay-loam soils. AiCpTe2: Primarily associated with minor drainage lines intersecting low stony hills and undulating plains. Reddish brown clay-loam soils. AiSgTb: Primarily associated with rocky ridges and outcrops. Reddish brown clay-loam soils.	Mosaic	○ *Triodia low hummock grassland* • Mosaic of AiCpTe1, AiCpTe2 and AiSgTbAiCpTe1: *Acacia inaequilatera* tall sparse shrubland; ±*Corchorus parviflorus* low sparse shrubland; *Triodia epactia*, ±*Triodia brizoides* low hummock grassland. • AiCpTe2: *Acacia inaequilatera* tall sparse shrubland; *Corchorus parviflorus* low sparse shrubland; *Triodia epactia* low hummock grassland. • AiSgTb: *Acacia inaequilatera*, *Hakea lorea* subsp. l*orea* tall open shrubland; *Senna glutinosa* mid open shrubland; *Triodia brizoides*, *Triodia epactia*, *Cymbopogon ambiguus* low hummock/tussock grassland.	Poor to Excellent	56,633.25	62.94%
-	Cleared	Areas that have been completely cleared of native vegetation, such as access tracks and historic mining areas.	-	844.56	0.94%
Total				**89,973.86**	**100%**

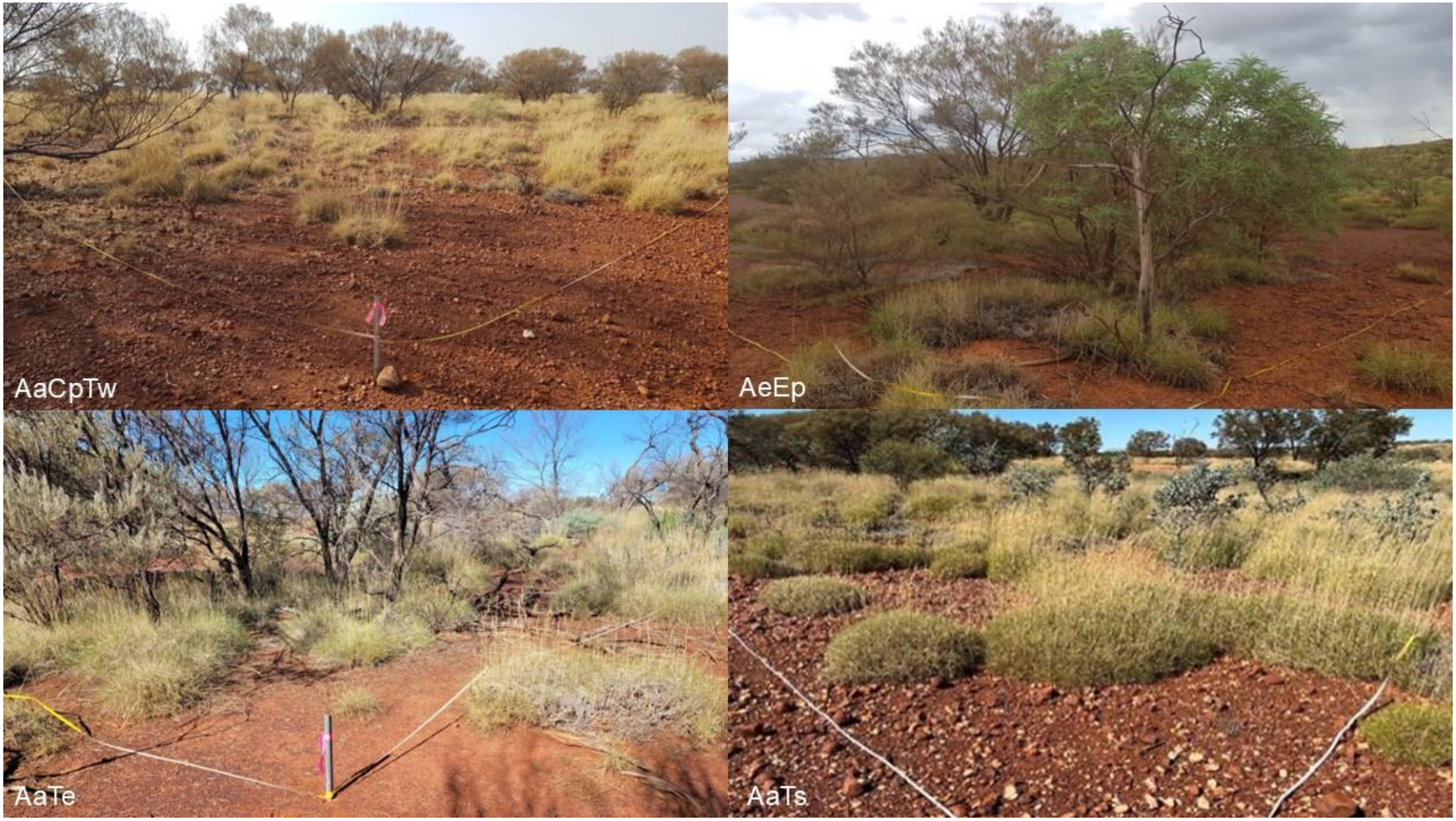

Plate 7-1: Vegetation Types within the Development Envelope (ecologia, 2025a; SLR, 2024).

Plate 7-2: Vegetation Types within the Development Envelope (ecologia, 2025a; SLR, 2024).

Plate 7-3: Vegetation Types within the Development Envelope (ecologia, 2025a; SLR, 2024).

Plate 7-4: Vegetation Types within the Development Envelope (ecologia, 2025a; SLR, 2024).

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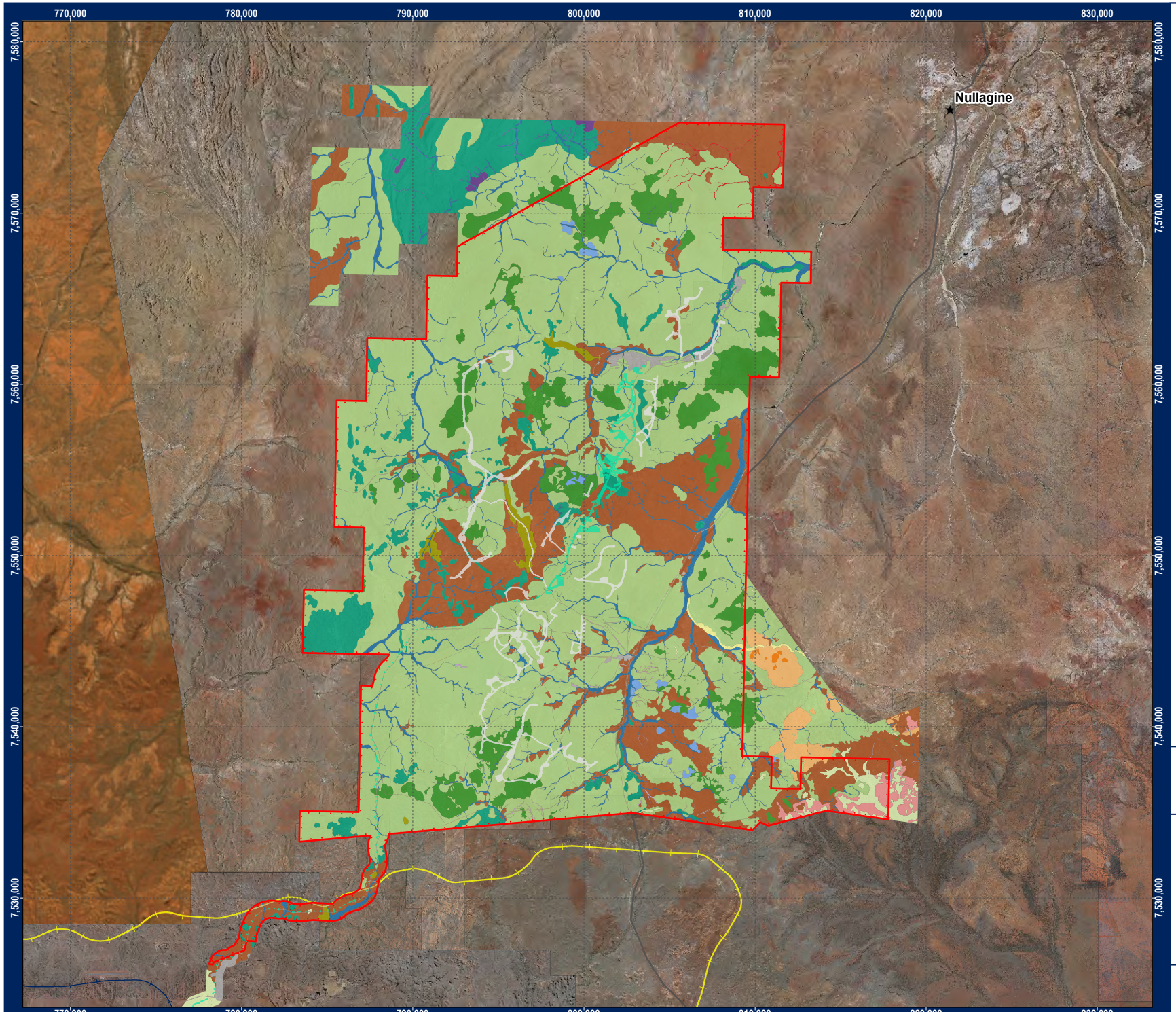

Legend

- Development Envelope
- GOV Towns
- Major Roads
- Fortescue Rail
- Roy Hill Rail
- Indicative Disturbance Footprint
- Approved Disturbance (Nullagine Pilot Wind Farm)

Vegetation Type

- Cleared
- AaCpTw
- AaEp
- AaTe
- AaTs
- AcTe
- AeTe
- AhCspYTe
- AmTe
- AoTe
- EcAcCs
- ElAbTl
- ElGwTe
- EvAcCc
- Mos
- VfAl

Data Source(s):
Aerial, Fortescue and ESRI
All other data, Fortescue, 2025

N

0 2 4 6 8 10
Kilometers

Figure 7-2
Vegetation Types
within the Development Envelope

Requested By: R. Dorji
Drawn By: R. Kerr
Revised By: rykerr
Approved By:
Scale: 1:300,000
Coordinate System: GDA 1994 MGA Zone 50
Project Name: 4519OP002_MP_EN_0093_PartIV
Document Name: 4519OP002_MP_EN_0093_008_r1_Veg_Types

Date: 1/28/2026
Size: A4L
Revision: 1
Confidentiality: 0

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7.4.4 Vegetation Condition

Vegetation condition was recorded in accordance with EPA (2016). Most vegetation within the DE was assessed as 'Excellent' (total of 90.07%; Table 7-4). The remainder of the vegetation ranged from 'Degraded' (1.93%) to Very Good (3.58%), with 0.94% of the DE having been completely cleared. Most degradation observed within the DE was associated with riparian habitat, in which dense **Cenchrus ciliaris* (Buffel Grass) and **Cenchrus setiger* (Birdwood Grass) infestations were sometimes present.

Most of the cleared areas are associated with the former BC Iron mine site, which also shows infestations of **Calotropis procera* (Calotrope), **Aerva javanica* (Kapok Bush), and **Cenchrus ciliaris* (Buffel Grass). These areas of weed infestation tend to be restricted to historically disturbed sites, and the surrounding undisturbed vegetation is usually in Very Good to Excellent condition (ecologia, 2025a).

A breakdown of vegetation condition by vegetation types is provided in Table 7-5.

Table 7-4: Vegetation Condition within the Development Envelope

Vegetation Condition	Area within DE (ha)	Proportion of DE (%)
Excellent	81,043.21	90.07%
Very Good	3,220.24	3.58%
Good	484.83	0.54%
Poor	2,647.51	2.94%
Degraded	1,733.51	1.93%
Total*	**89,129.30**	**99.06%**

*The total area of the DE is 89,973.86, including 844.56 ha (0.94%) of previously cleared areas, which is not included in the vegetation condition mapping.

Table 7-5: Vegetation Condition per Vegetation Type within the Development Envelope

Vegetation Types	Vegetation condition within DE (ha)					
	Excellent	Very Good	Good	Poor	Degraded	Total
AaCpTw	346.19	-	-	-	-	**346.19**
AaEp	150.26	-	147.98	-	168.97	**467.21**
AaTe	589.26	-	-	-	-	**589.26**
AaTs	400.81	-	-	-	-	**400.81**
AcTe	-	163.89	-	-	-	**163.89**
AeTe	66.42	-	-	-	-	**66.42**
AmTe	56.77	7.72	9.33	5.03	7.93	**86.79**
EcAcCs	61.88	4.34	-	-	22.06	**88.27**
ElAbTl	15,059.34	124.60	-	-	-	**15,183.93**
ElGwTe	4,033.25	-	-	-	-	**4,033.24**
EvAcCc	58.22	257.46	229.00	2,181.53	1,534.56	**4,260.76**
VfAl	3,687.23	2,584.97	98.52	438.54	-	**6,809.26**

Vegetation Types	Vegetation condition within DE (ha)					
	Excellent	Very Good	Good	Poor	Degraded	Total
Mos (AiCpTe1, AiCpTe2, and AiSgTb)	56,533.58	77.26	-	22.41	-	**56,633.25**
Total*	**81,043.21**	**3,220.24**	**484.83**	**2,647.51**	**1,733.51**	**89,129.30**

*The total area of the DE is 89,973.86, including 844.56 ha (0.94%) of previously cleared areas.

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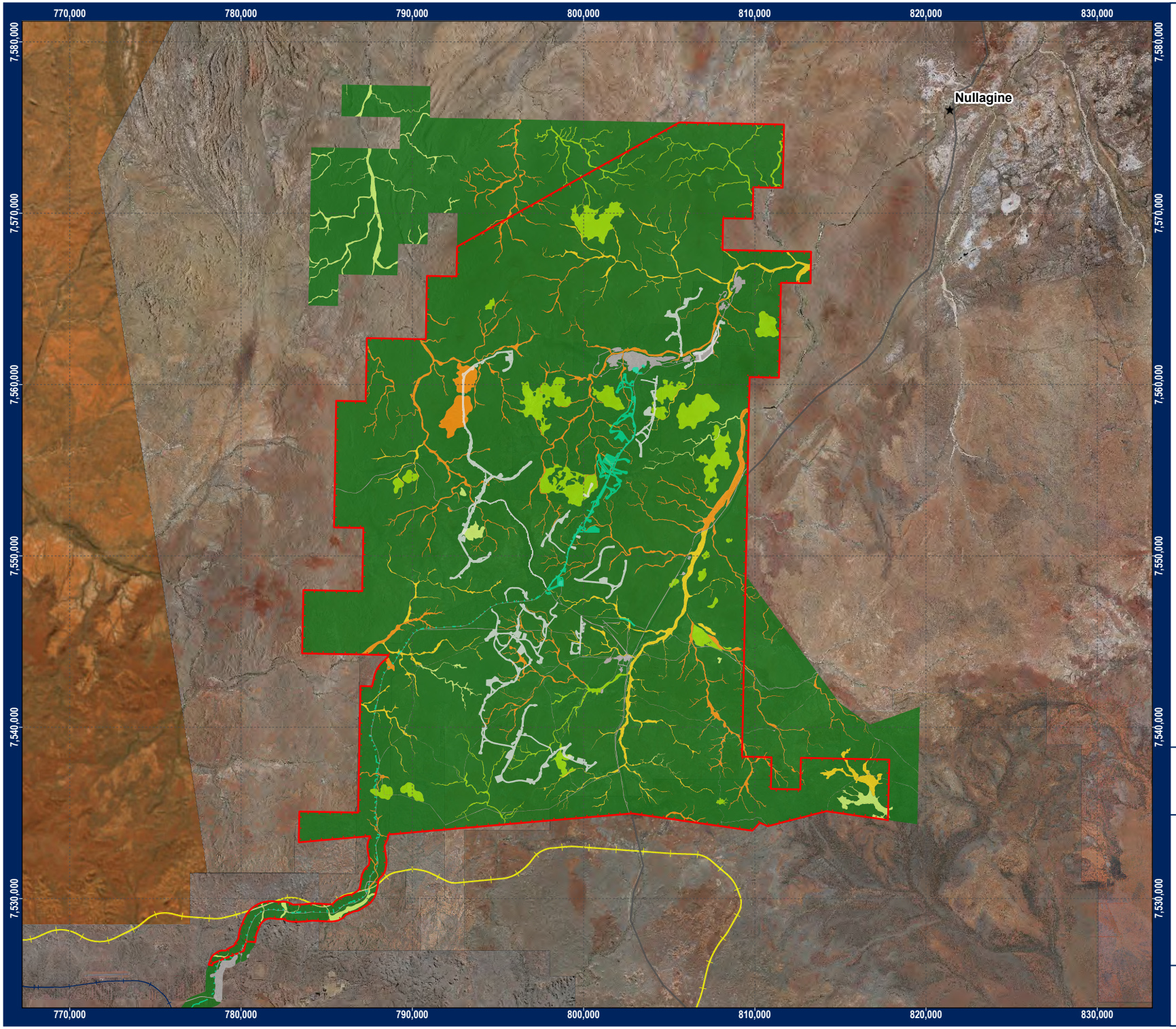

Legend

- Development Envelope
- GOV Towns
- Major Roads
- Fortescue Rail
- Roy Hill Rail
- Indicative Disturbance Footprint
- Approved Disturbance (Nullagine Pilot Wind Farm)

Vegetation Condition

- Excellent
- Very Good
- Good
- Degraded
- Poor
- Cleared

Data Source(s):
Aerial, Fortescue and ESRI
All other data, Fortescue, 2025

N

0 2 4 6 8 10
Kilometers

Figure 7-3
Vegetation Condition
within the Development Envelope

Requested By: R. Dorji	Date: 1/28/2026
Drawn By: R. Kerr	Size: A4L
Revised By: rykerr	Revision: 1
Approved By:	Confidentiality: 0
Scale: 1:300,000	
Coordinate System: GDA 1994 MGA Zone 50	
Project Name: 4519OP002_MP_EN_0093_PartIV	
Document Name: 4519OP002_MP_EN_0093_009_r1_Veg_Cond	

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7.4.5 Conservation Significant Vegetation

7.4.5.1 Threatened and Priority Ecological Communities

The DBCA database search did not identify any EPBC Act or BC Act listed Threatened Ecological Communities (TEC) within 50 km of the DE (ecologia, 2025a). Six Priority Ecological Communities (PEC) were identified within 50 km of the DE, including one overlapping the DE (Figure 7-4; Table 7-6):

Table 7-6: Priority Ecological Community within, and in the Vicinity of the Development Envelope

Priority Ecological Community	Location and distance to DE (km)
'Fortescue Marsh (Marsh Land System)' (P1)	Located approximately 9.3 km southwest of the DE. The buffer of this PEC is approximately 4 km southwest of the DE.
'Four plant assemblages of the Wona Land System' (P1, P3)	Located in multiple areas throughout the DE (Figure 7-4).
Stony saline clay plains of the Mosquito Land system' (P3):	Approximately 5.63 km northeast and outside of the DE.
'Narbung Land System' (P3):	Approximately 37 km south and outside of the DE.
'Freshwater claypans downstream of the Fortescue Marsh - Goodiadarrie Hills on Mulga Downs Station.'(P1)	Approximately 30 km south and outside of the DE.
'Vegetation of sand dunes of the Hamersley Range/Fortescue Valley' (P3)	Approximately 50 km south and outside of the DE.

No vegetation types analogous to any EPBC Act or BC Act listed TECs were recorded during the flora and vegetation surveys.

The DBCA database has records of approximately 20,808.43 ha of the 'Four plant assemblages of the Wona Land System' PEC within 50 km of the DE[4], most of which (13,338.71 ha) occurs outside the DE.

One vegetation type recorded within the DE, VfAl, was broadly consistent with the 'Four plant assemblages of the Wona Land System' PEC, and specifically the Priority 1 sub-community 'Cracking clays of the Chichester and Mungaroona Range' ecologia (2025a). The 'Cracking clays of the Chichester and Mungaroona Range' is described as: shrubless plain of stony gibber community occurring on the tablelands with very little vegetative cover during the dry season, and ephemerals/annuals and short-lived perennials emerging during the wet season, many of which are poorly known and range-end taxa (DBCA, 2023a). Vegetation type VfAl covers 6,809.26 ha (7.57%) of the DE. Of which 5,225.35 ha has been previously mapped by DBCA as the 'Four plant assemblages of the Wona Land System' PEC (P1, P3). The remaining 1,583.91 ha was not included in the area mapped by DBCA and is considered potential PEC. While the DBCA mapping does not identify the sub-community it is assumed to be the Cracking clays of the Chichester and Mungaroona Range (P1) given that VfAl is analogous to this sub community and the overlap of this vegetation unit with the DBCA mapping.

The vegetation condition for the Cracking clays of the Chichester and Mungaroona Range PEC (P1) and Potential Cracking clays of the Chichester and Mungaroona Range PEC (P1)

[4] Area calculated based on the DBCA database (2025), excluding buffer radius.

is described in Table 7-7. The majority of the Cracking clays of the Chichester and Mungaroona Range PEC (P1) and Potential Cracking clays of the Chichester and Mungaroona Range PEC (P1) are in 'Excellent' to 'Very Good' condition (92.93% and 89.40%, respectively).

Table 7-7: Vegetation Condition - Priority Ecological Community within the Development Envelope

Priority Ecological Community	Vegetation Condition within DE (ha)				Total (ha)
	Excellent	Very Good	Good	Poor	
Four plant assemblages of the Wona Land System' PEC (Cracking clays of the Chichester and Mungaroona Range P1)*	2,923.74	1932.40	-	369.22	**5,225.35**
Potential 'Four plant assemblages of the Wona Land System' PEC (Cracking clays of the Chichester and Mungaroona Range P1)**	763.49	652.57	98.52	69.32	**1,583.91**

*Vegetation type VfAl that overlaps the area previously mapped by DBCA as the 'Four plant assemblages of the Wona Land System' PEC (P1)

**Vegetation type VfAl that does not overlap area previously mapped by DBCA as the 'Four plant assemblages of the Wona Land System' PEC (P1)

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Legend

- Development Envelope
- GOV Towns
- Major Roads
- Fortescue Rail
- Roy Hill Rail
- Indicative Disturbance Footprint
- Approved Disturbance (Nullagine Pilot Wind Farm)
- Potential Priority Ecological Communities
- Priority Ecological Communities

Data Source(s):
Aerial, Fortescue and ESRI
All other data, Fortescue, 2025

N

0 2 4 6 8 10
Kilometers

Figure 7-4
Threatened and Priority Ecological Communities within the Development Envelope

Requested By: R. Dorji
Drawn By: R. Kerr
Revised By: rykerr
Approved By:
Scale: 1:300,000
Coordinate System: GDA 1994 MGA Zone 50
Project Name: 4519OP002_MP_EN_0093_PartIV
Document Name: 4519OP002_MP_EN_0093_010_r1_PEC

Date: 1/28/2026
Size: A4L
Revision: 1
Confidentiality: 0

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7.4.5.2 Riparian, Groundwater Dependent and Potentially Groundwater Dependent Vegetation

Three tree species commonly associated with riparian habitats in the Pilbara are considered potentially groundwater dependent: *Eucalyptus camaldulensis* (river red gum), *Eucalyptus victrix* (coolabah), and *Melaleuca argentea* (silver cadjeput). *Eucalyptus camaldulensis* and *Eucalyptus victrix* are facultative phreatophytes, which are species that may be dependent on groundwater or water from the capillary fringe in environments that have otherwise low available surface derived water, particularly in the arid zone and during extended dry periods (Batini, 2009; Froend, 2009). This is particularly relevant during the Pilbara dry season (April to November) when recharge of the groundwater table is likely to be minimal and alternative water sources are limited (Eamus & Froend, 2006), although they appear to be resilient to fluctuating water table levels and drought (Batini, 2009; Pfautsch, Dodson, Madden, & Adams, 2014). *Melaleuca argentea* is considered an obligate phreatophyte that is reliant on groundwater for its survival. Plant communities in which these species are dominant may be considered groundwater dependent vegetation (GDV) in some situations, and may potentially be impacted by groundwater abstraction, but they do not generally have any specific conservation significance.

Vegetation type EcAcCs (supporting *Melaleuca argentea* and *Eucalyptus camaldulensis*) and parts of EvAcCc that supported *Eucalyptus camaldulensis* were considered to be GDV and accounted for 2,851.92 ha (3.17%) of the DE. The remaining parts of vegetation type EvAcCc (supporting only *Eucalyptus victrix*) is potential a GDV and accounted for 1497.11 ha (1.66%) DE. Combined, this represents a total of 4,349.03 ha of groundwater dependent and potentially groundwater dependent vegetation within the DE.

These vegetation types are also considered riparian vegetation. Most of these Vegetation Types are in ‘Poor’ to ‘Degraded’ condition (91.35% of the mapped Groundwater Dependent Vegetation and 75.68% of the mapped Potentially Groundwater Dependent Vegetation).

7.4.5.3 Other Potentially Significant Vegetation

Vegetation that plays a potential role as refuge

The Wona land system has a relatively restricted and patchy regional distribution and supports many plant species restricted to clay soils. This habitat is potentially a refuge for species restricted to clay soils in the Pilbara (ecologia, 2025a). The Wona land system was represented by vegetation type VfAl within the survey area, which has a total extent of 6,809.26 (7.57%) within the DE.

Locally restricted vegetation types

Ten vegetation types (AaCpTw, AaEp, AaTe, AaTs, AcTe, AeTe, AmTe, EcAcCs, ElGwTe and EvAcCc) within the DE were identified by ecologia (2025a) as potentially restricted in a local context because each comprises less than 5% of the DE. Although these vegetation types comprise a relatively small proportion of the DE, this may be a function of the survey area boundary and the linear nature of some of these vegetation types. All locally restricted vegetation types within the DE are represented by an area greater than 50 ha and are unlikely to be of significance, unless considered significant for other reasons already discussed. Further, ecologia (2025a) does not consider any of these locally restricted vegetation types as significant. The condition of these vegetation types range from ‘Poor’ to ‘Excellent’ and are described in Table 7-4.

7.4.5.4 Summary of Conservation significant vegetation

The conservation significance of vegetation within the DE was assessed based on the vegetation (Section 7.4.1 to Section 7.4.5) and flora (Section 7.4.6 to Section 7.4.9) described in the existing environment. The criteria relevant to this assessment are present in Table 7-8.

Table 7-8: Criteria for the Assessment of Conservation Significance of Vegetation

Significance scale	Significance criteria
Nationally significant vegetation	Presence of EPBC Act listed Threatened flora species or communities.
	Presence of Ramsar Wetlands
State significant vegetation	Presence of State-listed Threatened flora species or communities.
	Land within or in areas recommended by DBCA for inclusion in the State-managed conservation estate
	Pre-European vegetation extent below 30%
Regionally significant vegetation	Presence of DBCA listed Priority flora species or ecological communities
	Presence of ESAs/areas relevant to a conservation scheme;
	Important for maintaining ecological processes (e.g., groundwater dependent vegetation and riparian vegetation); and
	Presence of significant undescribed taxa. Note that although vegetation may contain undescribed taxa, these species may still be common and are potentially not significant.
Locally significant vegetation	Presence of small, isolated communities of limited extent and/or distribution (i.e., < 5% of the total DE).

No DBCA mapped TECs (or vegetation analogous to any TECs), or populations of Threatened flora (EPBC Act or BC Act listed) were recorded within the DE. Therefore, no vegetation types of National or State significance occur within the DE. Vegetation type VfAl is associated with the presence of a PEC and a potential PEC (as described in Section 7.4.5.1) and is therefore considered to be of Regional significance. This vegetation type also has a potential role as refuge.

Eleven vegetation types within the DE (AaEp, AcTe, AeTe, EcAcCs, ElAbTl, ElGwTe, EvAcCc, Mos (AiCpTe1, AiCpTe2, AiSgTb) and VfAl) contain records of Priority flora species. While these records are distributed throughout the DE, certain discrete areas of vegetation types (VfAl, ElAbTl, ElGwTe) have a higher concentration of records. Additionally, there is one Priority flora species (*Acacia cyperophylla* var. *omearana*) restricted to a single vegetation type (AcTe). The remaining vegetation types contain only a low number of records (one to three) or species that occur across multiple vegetation types. Therefore, only vegetation types VfAl, ElAbTl, ElGwTe and AcTe are considered regionally significant (refer to Table 7-10, Figure 7-8).

Two vegetation types (AmTe and EcAcCs) contain flora species with potential range extensions (refer to Section 7.4.8). Among these, a single individual of *Stenopetalum velutinum* was recorded within AmTe, while 13 individuals belonging to three species, were recorded within EcAcCs. Due to the very low number of individuals within AmTe, this vegetation type is not considered significant. EcAcCs contains a single individual of two species and 10 individuals of *Brachyscome rudallensis*. This species was previously recorded only twice in Atlas of Living Australia (ALA) (2025), suggesting that its limited distribution is likely due to a lack of records rather than a true range extension. As a result, this vegetation type is also not considered significant.

Eight vegetation types (AaCpTw, AaTs, EcAcCs, ElAbTl, Mos (AiCpTe1, AiCpTe2, AiSgTb) and VfAl) contain records of three atypical species that might represent a new species (refer to Section 7.4.8). In total, ecologia (2025a) recorded 14 individuals, with most vegetation types (AaCpTw, AaTs, EcAcCs) containing only a single individual. Five vegetation types (ElAbTl, Mos (AiCpTe1, AiCpTe2, AiSgTb) and VfAl) contain records of two to five individuals of these atypical species. However, these vegetation types cover a large proportion of the DE, and the atypical species are not concentrated in any specific area. Therefore, due to the low number of records and their scattered distribution, these vegetation types are not considered significant.

Vegetation type EcAcCs (supporting *Melaleuca argentea* and *Eucalyptus camaldulensis*) and parts of EvAcCc that supported *Eucalyptus camaldulensis* were considered to be GDV. The remaining parts of vegetation type EvAcCc (supporting only *Eucalyptus victrix*) is a potential GDV. Both vegetation units are considered regionally significant due to the presence of GDV.

Overall, of the 14 potentially significant vegetation types within the DE, six are considered to be of significance. Table 7-9 summarises the conservation significant vegetation within the DE.

Table 7-9: Summary of Conservation Significant Vegetation within the Development Envelope

Scale	Significant aspects found within DE	Vegetation Types within DE
Regional Significance	Presence of PEC or potential PEC	VfAl
	Presence of Priority flora	AcTe, VfAl, ElAbTl, ElGwTe
	Role in maintaining an important ecological process (i.e., Riparian and/or groundwater dependent vegetation and fauna and flora refuge)	EvAcCc, EcAcCs, VfAl

7.4.6 Flora

A total of 517 flora species, from 190 genera and 60 families were recorded within the DE during the field assessments. The dominant families recorded were Fabaceae (96 taxa), Poaceae (77 taxa), Malvaceae (56 taxa). The dominant genera recorded were *Acacia* (35 taxa), *Sida* (15 taxa) and *Ptilotus* (15 taxa). The inventory of vascular flora recorded is presented in Appendix A (ecologia, 2025a).

7.4.7 Conservation Significant Flora

7.4.7.1 Threatened Flora

The desktop survey identified one Threatened flora species within 50 km of the DE. There are three records of *Quoya zonalis* (Pilbara Foxglove), listed as Endangered under the BC Act and EPBC Act, 9 km north of the DE (TPFL, 2025; WAHerb, 2025). The survey undertaken by ecologia (2025a) recorded 23 individuals within the survey area, however, these were located 4.5 km north, outside of the DE.

7.4.7.2 Priority Flora

The desktop survey identified 59 Priority flora species identified by DBCA and/or Fortescue's database that have previously been recorded within 50 km of the DE, of which ten species occurred within the DE. The surveys undertaken by ecologia (2025a) recorded 13 Priority

flora species (as shown on Figure 7-5) including five species which were previously recorded within the DE, as described below and summarised in Table 7-10.

Acacia cyperophylla var. *omearana* (P1)

Acacia cyperophylla var. *omearana* is a perennial tree growing between 4-10 m tall, usually occurring in stony and gritty alluvium along drainage lines, shown in Plate 7-5. The species has yellow flowers and 'minni-ritchi' bark, and flowers in March and April (WA Herbarium, 1997). The species has a current known distribution from north of Mable Bar southeast to Newman where it is restricted to stony alluvium along drainage lines (ecologia, 2025a). This species is listed as Priority 1 by DBCA.

Previous Fortescue and DBCA (TPFL, 2025; WA Herb, 2025) records, identified 2,070 individuals from 18 occurrences previously recorded within 50 km of the DE. Of those 18 occurrences, none were previously recorded within the DE.

During the field survey, six occurrences, totalling 1,173 individuals were recorded within the Survey Area. Of those, 1,143 individuals (4 occurrences) were recorded in the DE, restricted to the north of the Survey Area in stony creeks, all within vegetation type AcTe (ecologia, 2025a).

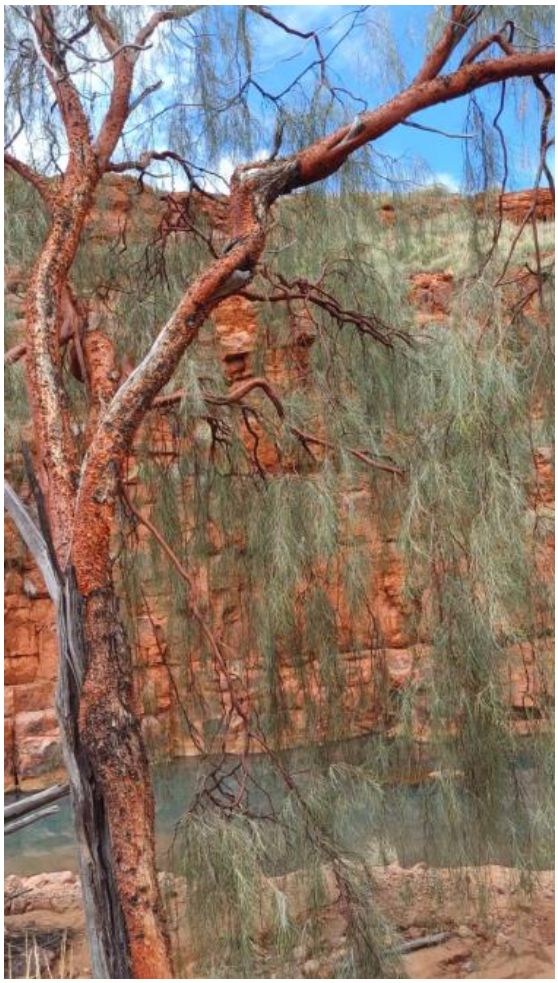

Plate 7-5 *Acacia cyperophylla* var. *omearana* (P1) (ecologia, 2025a)

Stemodia sp. Battle Hill (A.L.Payne 1006) (P1)

Stemodia sp. Battle Hill (A.L. Payne 1006) is a low shrub which grows in cracking clay and floodplains (WA Herbarium, 1998-). The species is only known from two general locations, southwest of Nullagine and east of Fortescue Marsh, where it has been found growing on cracking clay soils (ecologia, 2025a).

Existing Fortescue records and DBCA data (TPFL, 2025; WA Herb, 2025) estimated three individuals from three occurrences recorded within 50 km of the DE. All occurrences were previously recorded within DE in 2008.

During the field surveys, 370 individuals (55 occurrences) were recorded within the Survey Area, of which 368 individuals (54 occurrences) were recorded within the DE, all from vegetation type VfAl (ecologia, 2025a).

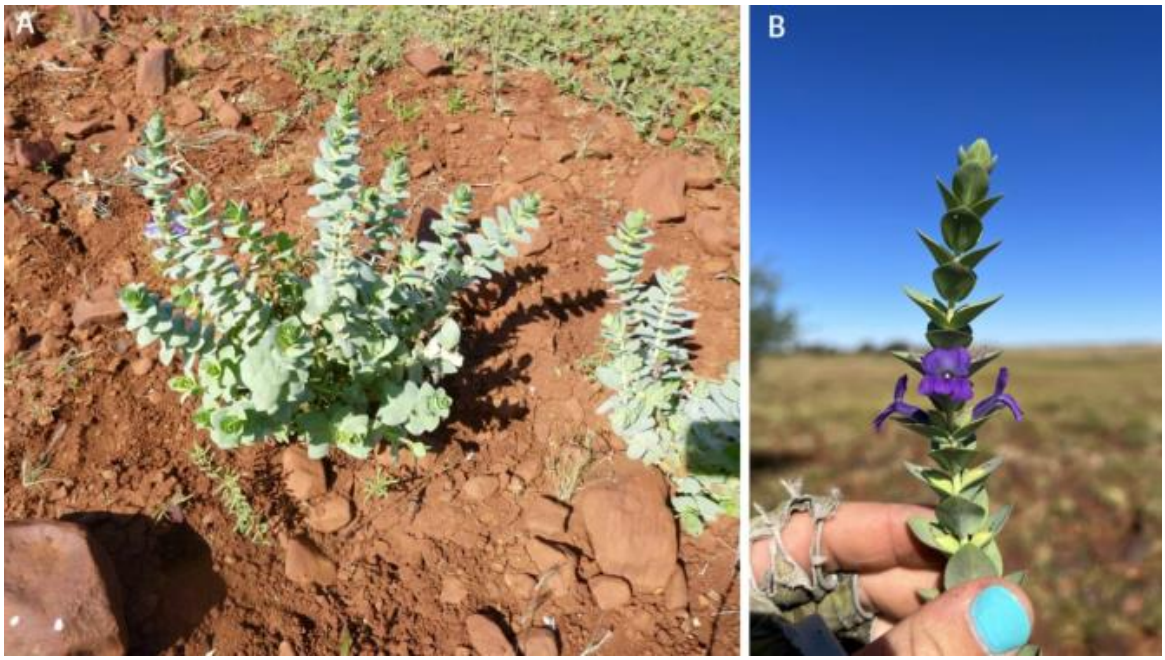

Plate 7-6 *Stemodia* sp. Battle Hill (A.L.Payne 1006) (P1) (SLR, 2024)

Paspalidium retiglume (P2)

Paspalidium retiglume is a tufted annual grass-like herb which grows between 0.1-0.5 m high (WA Herbarium, 1998-). The species flowers between March and September and grows in clay soils. This species is listed as Priority 2 by DBCA.

No previous records of this species were found within existing Fortescue records and DBCA data (TPFL, 2025; WA Herb, 2025).

During field surveys, 260 individuals (9 occurrences) were recorded within the Survey Area, of which 259 individuals (8 occurrences) were found within the DE on clay soils, all located within vegetation type VfAl.

Plate 7-7 *Paspalidium retiglume* (P2)

Dolichocarpa sp. Hamersley Station (A.A. Mitchell PRP 1479) (P3)

Dolichocarpa sp. Hamersley Station (A.A. Mitchell PRP 1479) is an annual herb, growing to 0.1 m tall with blue flowers (Falster *et al*., 2021). The species is endemic to WA and commonly found in the region from Karratha southeast to Newman. The species is widespread in the central Pilbara, it grows primarily on inundated clays on gibber plains (ecologia, 2025a). This species is listed as Priority 3 by DBCA.

The existing Fortescue and DBCA (TPFL, 2025; WA Herb, 2025) records identify one individual within 50 km buffer of the DE, which was previously recorded within the DE in 2022 (WA Herbarium, 2025).

During the field survey, 750 individuals (25 occurrences) were recorded within the Survey Area, all of which occur within the DE in clay soils within vegetation types VfAl and ElAbTl (ecologia, 2025a).

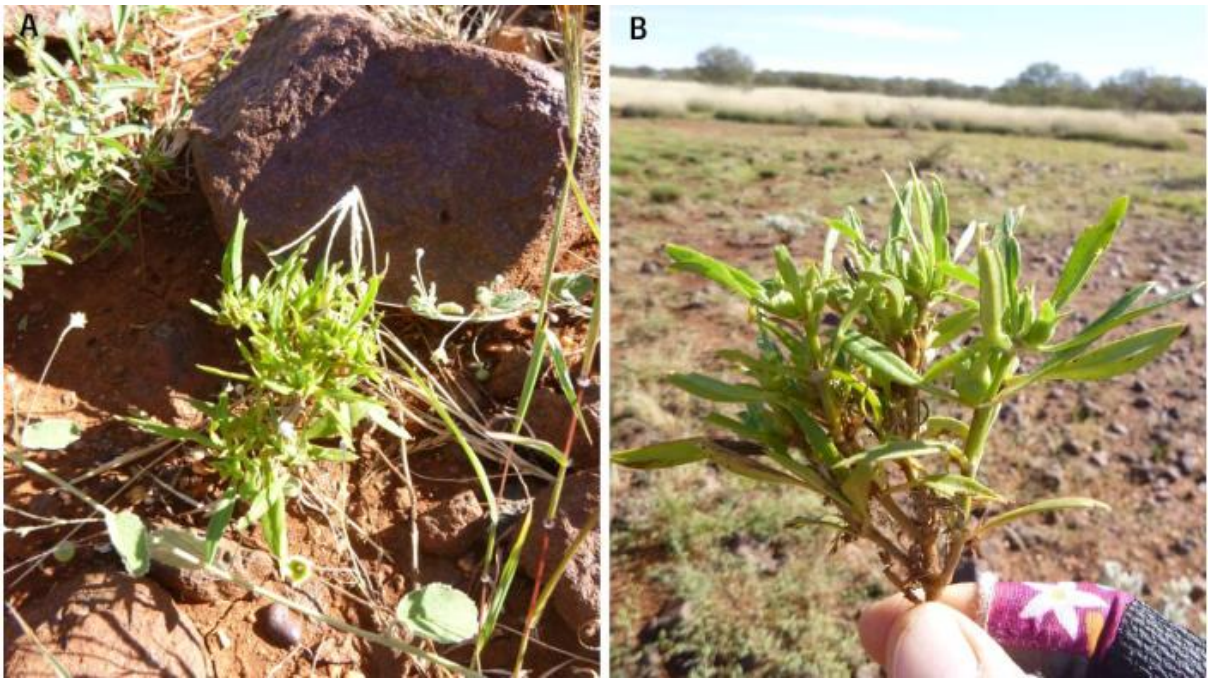

Plate 7-8 *Dolichocarpa* sp. Hamersley Station (A.A. Mitchell PRP 1479) (P3) (SLR, 2024)

Euphorbia inappendiculata var. *inappendiculata* (P3)

Euphorbia inappendiculata var. *inappendiculata* is an annual, prostrate herb, endemic to WA. The species grows to 0.1 m tall with dark green leaves above and light green below and light brownish green coloured stems. Flowering occurs between July and August, and the species is typically found on flats or gentle plains, cracking clay patches and orange-brown sandy loam (ecologia, 2025a; WA Herbarium, 1998-, FVC, 2024). This species is listed as Priority 3 by DBCA.

Existing Fortescue and DBCA (TPFL, 2025; WA Herb, 2025) records estimate 53 individuals from four occurrences within 50 km of the DE. None of which were previously recorded within the DE.

During field surveys, a single individual was recorded within DE and the Survey Area, recorded in clay soils within vegetation type ElAbTl (ecologia, 2025a).

Euphorbia inappendiculata var. *queenslandica* (P3)

Euphorbia inappendiculata var. *queenslandica* is an herb that flowers in the summer months and displays white-cream flowers (Falster *et al.*, 2021). The species occur across Australia and is typically associated with cracking clays (ecologia, 2025a). The species is listed as Priority 3 by DBCA.

Existing Fortescue and DBCA (TPFL, 2025; WA Herb, 2025) records estimates 40 individuals from 10 occurrences within 50 km the DE. None of those occurrences were previously recorded within the DE.

During field surveys, 1,977 individuals (90 occurrences) were recorded within the DE and Survey Area, on clay soils within vegetation type VfAl. It is locally abundant where it occurs (ecologia, 2025a).

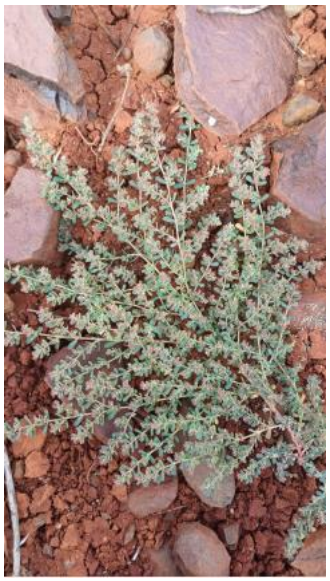

Plate 7-9 *Euphorbia inappendiculata* var. *queenslandica* (P3)

Euphorbia stevenii (P3)

Euphorbia stevenii is a perennial herb that grows between 0.1-0.5 m high in clay and sandy soils. *Euphorbia stevenii* extends from near Karratha southeast to near Newman in the Pilbara, with outlying records in the northern Kimberley (ecologia, 2025a). This species is listed as Priority 3 by DBCA.

No previous records of this species were found within existing Fortescue records and DBCA data (TPFL, 2025; WA Herb, 2025).

During field surveys, 80 individuals (two occurrences) were recorded within the DE and Survey Area, in clay soils within vegetation type VfAl.

Plate 7-10 *Euphorbia stevenii* (P3)

Iotasperma sessilifolium (P3)

Iotasperma sessilifolium is an annual, flowering herb growing to 0.35 m tall. The species is widespread across Australia (ALA, 2025) with 85 occurrence records spanning WA, NT, Queensland, New South Wales, and South Australia, and primarily grows along the edges of waterholes and on cracking clays (ecologia, 2025a). This species is listed as Priority 3 by DBCA.

Existing Fortescue and DBCA (TPFL, 2025; WA Herb, 2025) records estimate four individuals from four occurrences recorded within 50 km of the DE. Three of those individuals (three occurrences) were previously recorded within the DE in 2008.

During field surveys, one individual, which was not previously recorded, was identified within the Survey Area. This individual occurs within the DE, in a minor drainage line within the mosaic vegetation (AiCpTe1, AiCpTe2, AiSgTb) (ecologia, 2025a).

Ipomoea racemigera (P3)

Ipomoea racemigera extends from near Karratha in the northwest of its distribution to near Newman in the southeast. It is widespread in northern Australia, occurring in the southern and central Northern Territory, northern Queensland, and north-eastern South Australia (ecologia, 2025a). This species is listed as Priority 3 by DBCA.

Existing Fortescue and DBCA (TPFL, 2025; WA Herb, 2025) records estimate three individuals (three occurrences) recorded within 50 km of the DE. None of those occurrences were previously recorded within the DE.

During field surveys, 11 individuals (nine occurrences) were recorded within the Survey Area, of which nine individuals (seven occurrences) were recorded within the DE, in vegetation types AaEp, EvAcCc and EcAcCs.

Plate 7-11 *Ipomoea racemigera* (P3) (ecologia, 2025a)

Neptunia longipila (P3)

Neptunia longipila is a recently described species that was split from *Neptunia dimorphantha.* It is a Pilbara endemic occurring from near Karratha in the northwest of its distribution to near Newman in the southeast (ecologia, 2025a). This species is listed as Priority 3 by DBCA.

No previous records of this species were found within existing Fortescue records and DBCA data (TPFL, 2025; WA Herb, 2025).

During field surveys, 189 individuals (nine occurrences) were recorded within the Survey Area. All of which occur within the DE on clay soils associated with vegetation type VfAl.

Plate 7-12 *Neptunia longipila* (P3) (ecologia, 2025a)

Nicotiana umbratica (P3)

Nicotiana umbratica is a short-lived annual or perennial herb that can grow up to 0.7 m tall. Flowering occurs between April and June; the flowers are long, tubular, and white (WA Herbarium, 1998-). The species occurs in shallow soils and rocky outcrops (WA Herbarium, 1998). *Nicotiana umbratica* is listed as Priority 3 by DBCA.

Existing Fortescue and DBCA (TPFL, 2025; WA Herb, 2025) records estimate one individual previously recorded within 50 km of the DE. This individual is located outside of the DE.

During field surveys, 548 individuals (33 occurrences) were recorded within the Survey Area, of which 105 individuals (nine occurrences) were recorded in the DE, associated with vegetation types AeTe, AiCpTe1/AiCpTe2/AiSgTb Mos and ElAbTl.

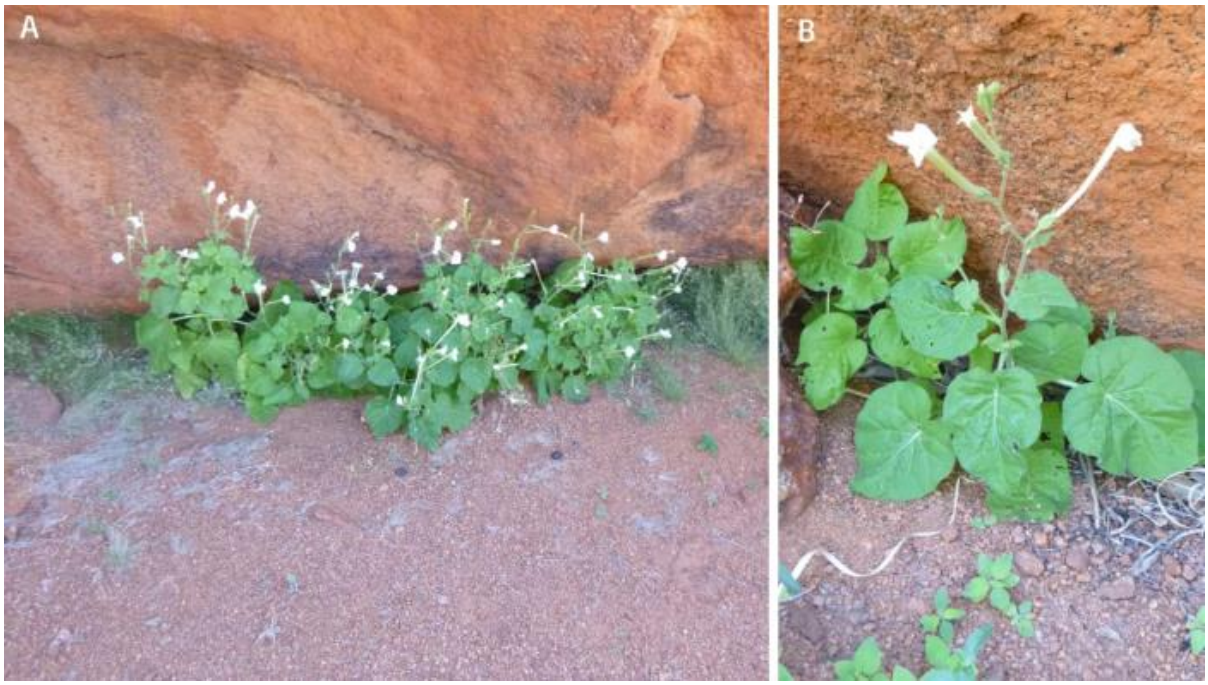

Plate 7-13 *Nicotiana umbratica* (P3) (SLR, 2024)

Swainsona thompsoniana (P3)

Swainsona thompsoniana is a prostrate, annual herb that grows up to 0.1 m tall. *Swainsona thompsoniana* occurs near Karratha in the north-west to near Newman in the southeast and is typically associated with heavy clay soils (Davis & Hurter, 2013). This species is listed as Priority 3 by DBCA.

Existing Fortescue and DBCA (TPFL, 2025; WA Herb, 2025) records estimate nine individuals (nine occurrences) recorded within 50 km the DE. Three individuals (three occurrences) were previously recorded within DE in 2022 and 2008 (WA Herb, 2025).

During the field surveys, 997 individuals (42 occurrences) were recorded within the Survey Area, of which 977 individuals (41 occurrences) occur within the DE on clay soils, primarily within vegetation type VfAl.

Plate 7-14 *Swainsona thompsoniana* (P3) (SLR, 2024)

Ptilotus mollis (P4)

Ptilotus mollis (P4) is a compact perennial shrub with soft grey foliage up to 0.5 m high. The species has densely clustered white or pink flower spikes that flower in May or September. *Ptilotus mollis* is known to occur on stony hills and screes (WA Herbarium, 1998-). *Ptilotus mollis* is listed as Priority 4 by DBCA.

Existing Fortescue, DBCA data and McPhee Creek Iron Ore Project records (TPFL, 2025; WA Herb, 2025; Atlas, 2022) estimate 6,531 individuals (298 occurrences) recorded within 50 km the DE. Of those occurrences, 521 individuals (22 occurrences) were previously recorded within DE in 2004 and 2008.

During the field surveys, 1,174 individuals (43 occurrences) were recorded within the Survey Area. All of which were found within the DE close to several existing known locations within the vegetation types ElAbTl and ElGwTe.

Plate 7-15 *Ptilotus mollis* (P4)

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Table 7-10: Conservation Significant Flora within the Development Envelope

DBCA listing	Scientific name	Location of individuals within DE	Individuals (occurrences) recorded within the DE*	Total Individuals (occurrences) recorded within the Survey Area*	Total individuals (occurrences) recorded within 50 km buffer**
Priority 1	*Acacia cyperophylla* var. *omearana*	AcTe – 1,143 ind.	1,143 individuals (4)	1,173 individuals (6)	3,243 individuals (24)
	Stemodia sp. Battle Hill (A.L. Payne 1006)	VfAl – 368 ind.	368 individuals (54)	370 ind. (59)	373 individuals (62)
Priority 2	*Paspalidium retiglume*	VfAl – 259 ind.	259 individuals (8)	260 individuals (9)	260 individuals (9)
Priority 3	*Dolichocarpa* sp. Hamersley Station (A.A. Mitchell PRP 1479)	ElAbT- 110 ind. VfAl – 640 ind.	750 individuals (25)	750 individuals (25)	751 individuals (26)
	Euphorbia inappendiculata var. *inappendiculata*	ElAbTl – 1 ind.	1 individual (1)	1 individual (1)	54 individuals (5)
	Euphorbia inappendiculata var. *queenslandica*	VfAl – 1,977 ind.	1,977 individuals (90)	1,977 individuals (90)	2,017 individuals (100)
	Euphorbia stevenii	VfAl – 80 ind.	80 individuals (2)	80 individuals (2)	80 individuals (2)
	Iotasperma sessilifolium	Mos -1 ind.	1 individual (1)	1 individual (1)	5 individuals (5)
	Ipomoea racemigera	AaEp – 2 ind. EcAcCs – 1 ind. EvAcCc - 6 ind.	9 individuals (7)	11 individuals (9)	14 individuals 12)
	Neptunia longipila	VfAl – 189 ind.	189 individuals (9)	189 individuals (9)	189 individuals (9)
	Nicotiana umbratica	AaTe – 5 ind. ElAbTl – 20 ind. Mos – 80 ind.	105 individuals (9)	548 individuals (33)	549 individuals (34)
	Swainsona thompsoniana	VfAl – 976 ind.	977 individuals (41)	997 individuals (42)	1,006 individuals (51)

DBCA listing	Scientific name	Location of individuals within DE	Individuals (occurrences) recorded within the DE*	Total Individuals (occurrences) recorded within the Survey Area*	Total individuals (occurrences) recorded within 50 km buffer**
		Cleared – 1 ind.			
Priority 4	*Ptilotus mollis*	ElAbTl – 166 ind. ElGwTe – 1,008 ind.	1174 individuals (43)	1174 individuals (43)	7,705 individuals (311)***

*Total number of individuals estimated based on ecologia (2025a)

**Includes records from spatial data provided by DBCA (WAHERB and TPFL), and records from the Fortescue Database (including records from ecologia (2025a) WAHerb records often provide the count (frequency) in descriptors such as common, occasional and scattered without providing an actual number of plants. For the purposes of this assessment these records have been counted as one individual for no comment, five individuals for 'scattered' or 'occasional' or 'uncommon', and 50 individuals for common/frequent/abundant.

***Including a total of 5,919 individuals (238 occurrences) recorded in McPhee Creek Iron Ore Project (Atlas, 2022), 30 km from the DE.

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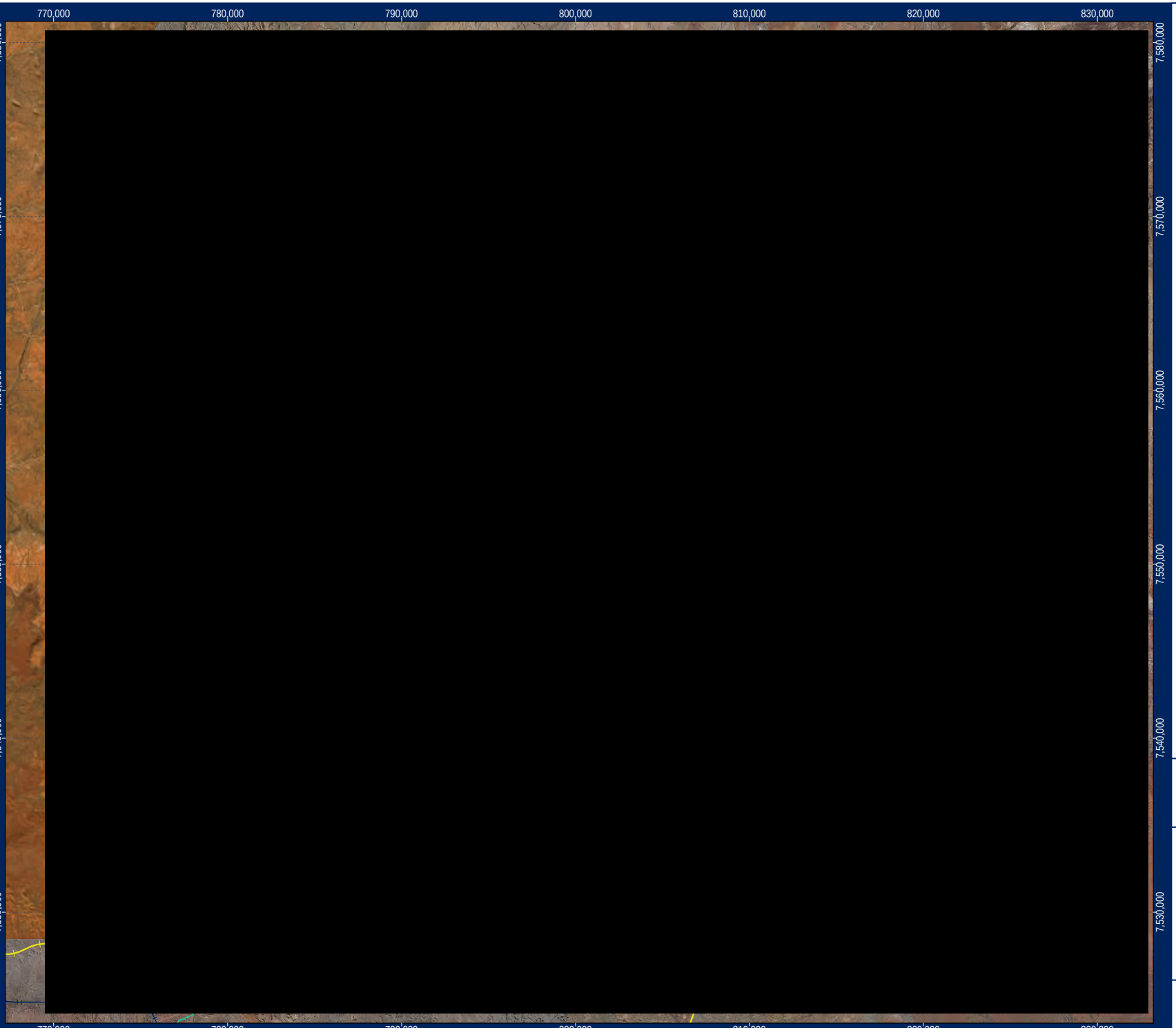

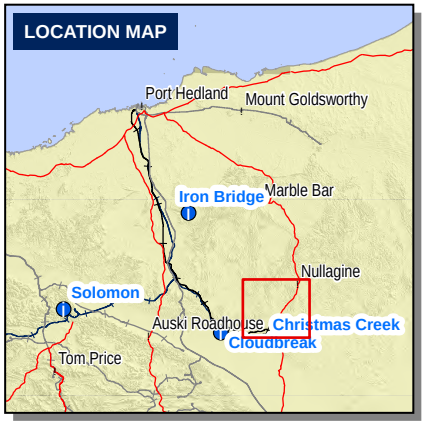

Legend

- Development Envelope
- GOV Towns
- Major Roads
- Fortescue Rail
- Roy Hill Rail
- Indicative Disturbance Footprint
- Approved Disturbance (Nullagine Pilot Wind Farm)

Priority 1 (DBCA)

- *Acacia cyperophylla var. omearana*
- *Corchorus sp. Yarrie (J. Bull & D. Roberts CAL 01.05)*
- *Stemodia sp. Battle Hill (A.L. Payne 1006)*

Priority 2 (DBCA)

- *Indigofera ixocarpa*
- *Neptunia longipila*
- *Paspalidium retiglume*

Data Source(s):
Aerial, Fortescue and ESRI
All other data, Fortescue, 2025

0 2 4 6 8 10
Kilometers

Figure 7-5-1
Conservation Significant Flora
within the Development Envelope

Requested By: R. Dorji	Date: 2/3/2026
Drawn By: R. Kerr	Size: A4L
Revised By: rykerr	Revision: 2
Approved By:	Confidentiality: 0
Scale: 1:300,000	
Coordinate System: GDA 1994 MGA Zone 50	
Project Name: 4519OP002_MP_EN_0093_PartIV	
Document Name: 4519OP002_MP_EN_0093_011a_r2_Cons_Sig_Flora	

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Legend

- Development Envelope
- GOV Towns
- Major Roads
- Fortescue Rail
- Roy Hill Rail
- Indicative Disturbance Footprint
- Approved Disturbance (Nullagine Pilot Wind Farm)

Priority 3 (DBCA)

- *Dolichocarpa sp. Hamersley Station (A.A. Mitchell PRP 1479)*
- *Euphorbia inappendiculata var. inappendiculata*
- *Euphorbia inappendiculata var. queenslandica*
- *Euphorbia stevenii*
- *Iotasperma sessilifolium*
- *Ipomoea racemigera*

Data Source(s):
Aerial, Fortescue and ESRI
All other data, Fortescue, 2025

0 2 4 6 8 10
Kilometers

Figure 7-5-2
Conservation Significant Flora
within the Development Envelope

Requested By: R. Dorji
Drawn By: R. Kerr
Revised By: rykerr
Approved By:
Scale: 1:300,000
Coordinate System: GDA 1994 MGA Zone 50
Project Name: 4519OP002_MP_EN_0093_PartIV
Document Name: 4519OP002_MP_EN_0093_011b_r2_Cons_Sig_Flora

Date: 2/2/2026
Size: A4L
Revision: 2
Confidentiality: 0

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Legend

- Development Envelope
- GOV Towns
- Major Roads
- Fortescue Rail
- Roy Hill Rail
- Indicative Disturbance Footprint
- Approved Disturbance (Nullagine Pilot Wind Farm)

Priority 3 (DBCA)

- *Nicotiana umbratica*
- *Rhagodia sp. Hamersley (M. Trudgen 17794)*
- *Rostellularia adscendens var. latifolia*
- *Swainsona thompsoniana*

Priority 4 (DBCA)

- *Bulbostylis burbidgeae*
- *Ptilotus mollis*

Data Source(s):
Aerial, Fortescue and ESRI
All other data, Fortescue, 2025

0 2 4 6 8 10
Kilometers

Figure 7-5-3
Conservation Significant Flora
within the Development Envelope

Requested By: R. Dorji	Date: 2/2/2026
Drawn By: R. Kerr	Size: A4L
Revised By: rykerr	Revision: 2
Approved By:	Confidentiality: 0
Scale: 1:300,000	
Coordinate System: GDA 1994 MGA Zone 50	
Project Name: 4519OP002_MP_EN_0093_PartIV	
Document Name: 4519OP002_MP_EN_0093_011c_r2_Cons_Sig_Flora	

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7.4.8 Other Significant Flora

Range Extensions

Ten species that occur more than 100 km from the nearest known record were identified by ecologia (2025a) within the Survey Area. Of those ten, four species were recorded at the edge of their known range in WA and ecologia (2025a) defined them as representing a significant extension of the species' distributions. The species and individuals recorded by ecologia within the DE (2025a) considered to be significant range extensions include:

- *Brachyscome rudallensis*: 10 individuals,
- *Calandrinia balonensis* (Parakeelya)*:* 1 individual,
- *Crotalaria cunninghamii* subsp. *cunninghamii* (Green Bird Flower*):* 1 individual, and
- *Stenopetalum velutinum* (Downy Thread-Petal): 1 individual.

Atypical species

Three taxa recorded within the DE are believed to be atypical. These species and individuals recorded within the DE are:

- *Olearia* aff. *fluvialis*: 1 individual,
- *Solanum* aff. *esuriale*: 1 individual, and
- *Solanum* aff. *horridum*: 12 individuals.

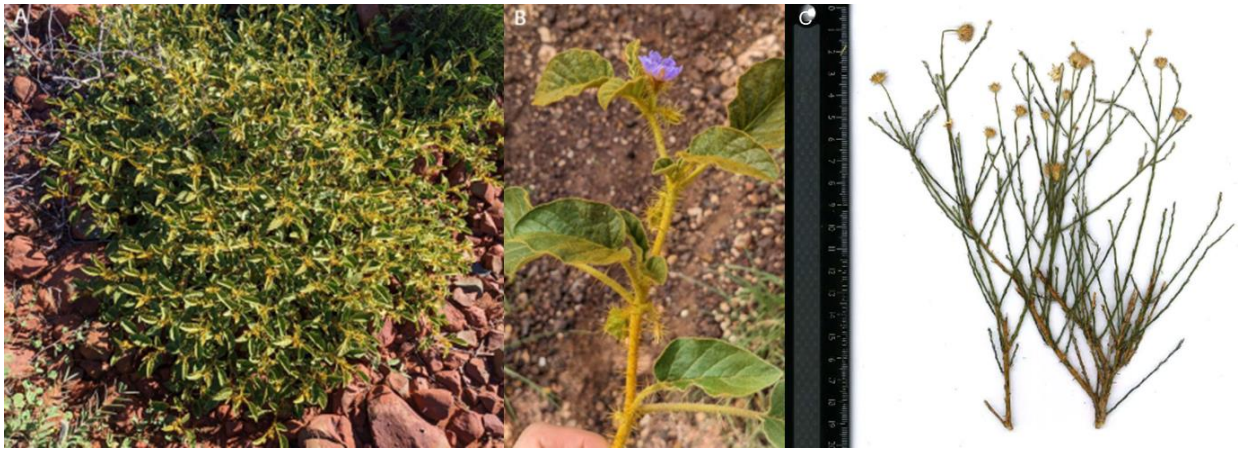

Plate 7-16 Atypical species recorded within DE (SLR, 2024)
A and B: *Solanum* aff.*horridum*; C: *Oleraria* aff.*fluvialis*

7.4.9 Introduced Flora

Twenty-five introduced flora species were recorded within the DE with **Cenchrus ciliaris* (Buffel Grass) and **Cenchrus setiger* (Birdwood Grass) being the most prominent. **Calotropis procera* was recorded within the DE from 17 locations (approximately 69 individuals), mostly

associated with the disturbed areas of the BC Iron Nullagine mine (ecologia, 2025a) (Table 7-11; Figure 7-6). **Calotropis procera* is a Declared Pest for the Pilbara region under the BAM Act however it is categorised as exempt, requiring no permit of conditions for keeping. It has not been assigned a control category.

The most significant weed infestations occurred in major drainage channels where **Cenchrus ciliaris* and *C. *setiger* occur. There were also notable infestations of **Vachellia farnesiana* usually associated with the Wona land system (ecologia, 2025a).

Table 7-11: Introduced Flora within Development Envelope

Scientific name	Common name	BAM Act	Individuals/ Occurrences Individuals within DE	Ecological Impact*
**Aerva javanica*	Kapok Bush	Permitted – s11	43 individuals (30)	High
**Alternanthera pungens*	Khaki Weed	Permitted – s11	1 individual (1)	Low
**Argemone ochroleuca* subsp. *ochroleuca*	Mexican poppy	Permitted – s11	2729 individuals (18)	Unknown
**Bidens bipinnata*	Bipinnate Begger's tick	Permitted – s11	157 individuals (9)	Unknown
**Calotropis procera*	Calotrope	Declared Pest - s22(2)	69 individuals (17)	Not listed
**Cenchrus ciliaris*	Buffel Grass	Permitted – s11	4075 individuals (77)	High
**Cenchrus setiger*	Birdwood Grass	Permitted – s11	4037 individuals (70)	High
**Chenopodium murale*	Nettle-leaf Goosefoot	Permitted – s11	1 individual (1)	Low
**Citrullus amarus*	Bitter melon	Not listed	1 individual (1)	Not listed
**Citrullus colocynthis*	Colocynth	Permitted – s11	4 individuals (4)	Unknow
**Cucumis myriocarpus* subsp. *myriocarpus*	Prickly paddy melon	Permitted – s11	3 individuals (3)	Low
**Cynodon dactylon*	Couch	Permitted – s11	5 individuals (5)	High
**Echinochloa colona*	Awnless Barnyard Grass	Permitted – s11	38 individuals (10)	High
**Euphorbia hirta*	Asthma Plant	Not listed	3 individuals (3)	Low
**Flaveria trinervia*	Speedy Weed	Not listed	18 individuals (4)	Not listed
**Malvastrum americanum*	Spiked Malvastrum	Permitted – s11	175 individuals (51)	High
**Phoenix dactylifera*	Date Palm	Permitted – s11	1 individual (1)	High
**Physalis angulata*	Wild Gooseberry	Permitted – s11	11 individuals (3)	Unknown
**Senna occidentalis*	Coffee senna	Permitted – s11	40 individuals (1)	Not listed
**Setaria verticillata*	Whorled Pigeon Grass	Permitted – s11	41 individual (3)	High
**Solanum nigrum*	Black Berry Nightshade	Permitted – s11	13 individuals (3)	Low
**Sonchus oleraceus*	Common Sowthistle	Permitted – s11	7 individuals (5)	Low
**Trianthema portulacastrum*	Giant Pigweed	Permitted – s11	2 individuals (2)	Not listed

Scientific name	Common name	BAM Act	Individuals/ Occurrences Individuals within DE	Ecological Impact*
**Tribulus terrestris*	Caltrop	Permitted – s11	113 individuals (13)	Unknown
**Vachellia farnesiana*	Mimosa Bush	Permitted – s11	386 individuals (96)	High

*Rating based on the WA Weed Prioritisation Process (ecologia, 2025a)

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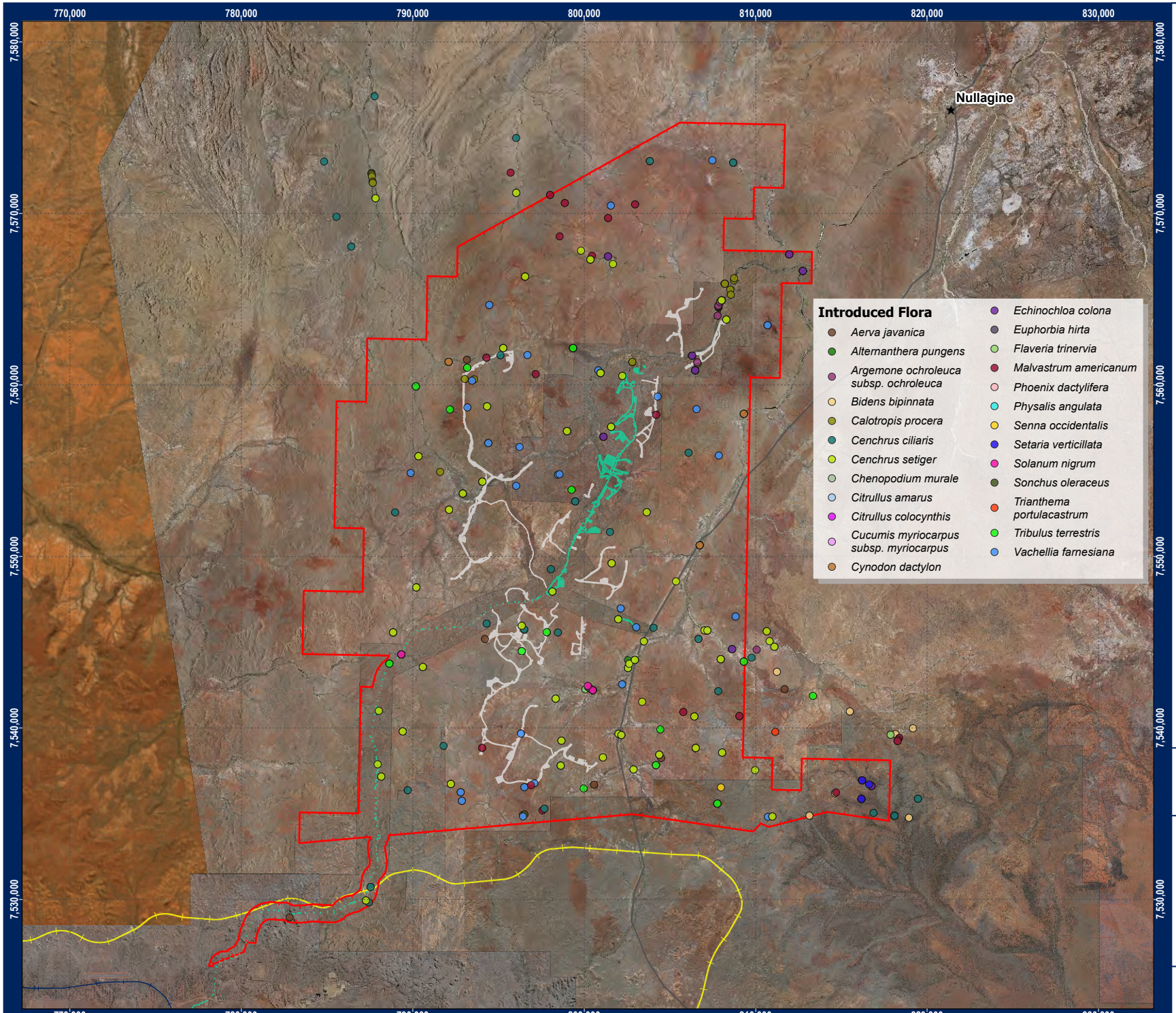

Legend

- Development Envelope
- GOV Towns
- Major Roads
- Fortescue Rail
- Roy Hill Rail
- Indicative Disturbance Footprint
- Approved Disturbance (Nullagine Pilot Wind Farm)

Data Source(s):
Aerial, Fortescue and ESRI
All other data, Fortescue, 2025

N

0 2 4 6 8 10
Kilometers

Figure 7-6
Introduced Flora
within the Development Envelope

Requested By: R. Dorji
Drawn By: R. Kerr
Revised By: rykerr
Approved By:
Scale: 1:300,000
Coordinate System: GDA 1994 MGA Zone 50
Project Name: 4519OP002_MP_EN_0093_PartIV
Document Name: 4519OP002_MP_EN_0093_012_r1_Introduced_Flora

Date: 1/28/2026
Size: A4L
Revision: 1
Confidentiality: 0

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7.4.10 Fire History

The Pilbara region is susceptible to increased bushfires during the dry season, from July to January. Most fires in the region are due to natural events, such as lightning strikes. However, a significant proportion of events have unknown or accidental causes. Comparatively, prescribed burns represent the smallest cause (Bryant, 2008).

The vegetation of the Pilbara is, in general, well adapted to fire, with many species relying on it as part of their life cycle (Carwardine *et al*., 2014). Most affected species have mechanisms that facilitate fire recovery, such as resistant seed banks and resprouting, but fire frequency and severity will determine the impact on recovery and conservation outcomes (Gallagher, *et al*., 2021). For example, short intervals between fires can disrupt the vegetation dynamics by impacting juvenile resprouting plants before they reach size sufficient to survive subsequent fires (Gallagher *et al*., 2021).

According to the DBCA Fire History (DBCA, 2024c), over 75% of the DE has been impacted by fire between 2006 and 2024, equating to over 68,700 ha. The largest recorded recent fires within the DE occurred in 2019, impacting 25,900.49 ha (28.79% of the DE). Prior to 2019, the most expansive fire events occurred in 2015 and 2016, impacting 14.66% and 10.32% of land within the DE, respectively. From 2020 to 2024, smaller, scattered fires impacted 7,888.47 ha (8.77%) of the DE (Plate 7-17; Figure 7-7) (ecologia, 2025a).

The fire history of the DE does not appear to have affected the vegetation condition, as most of the area remains in ‘Excellent’ condition.

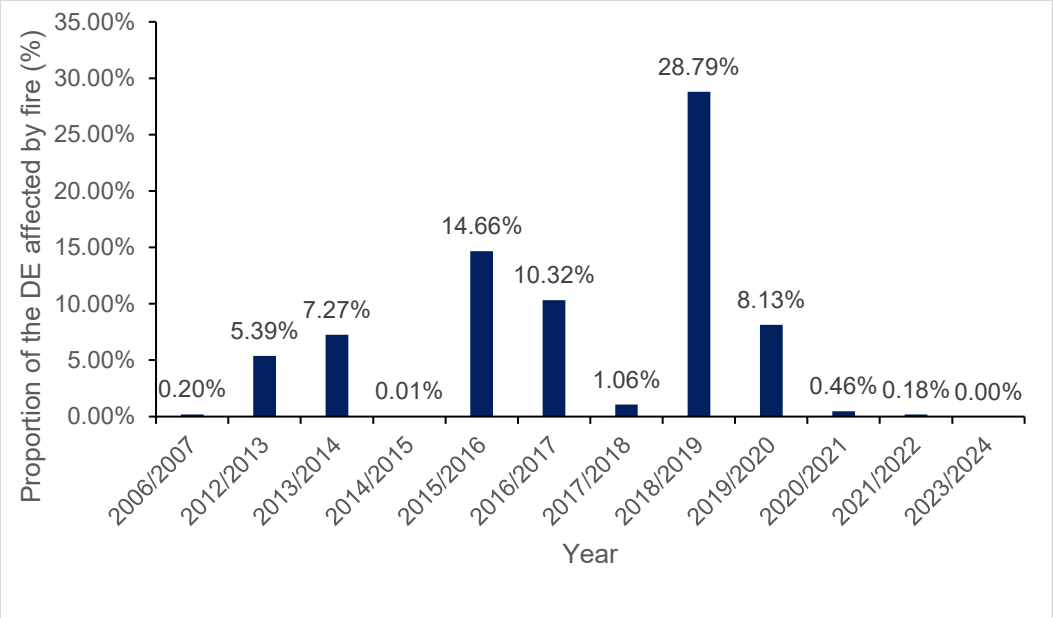

Plate 7-17 Fire history within the DE (2006-2024)

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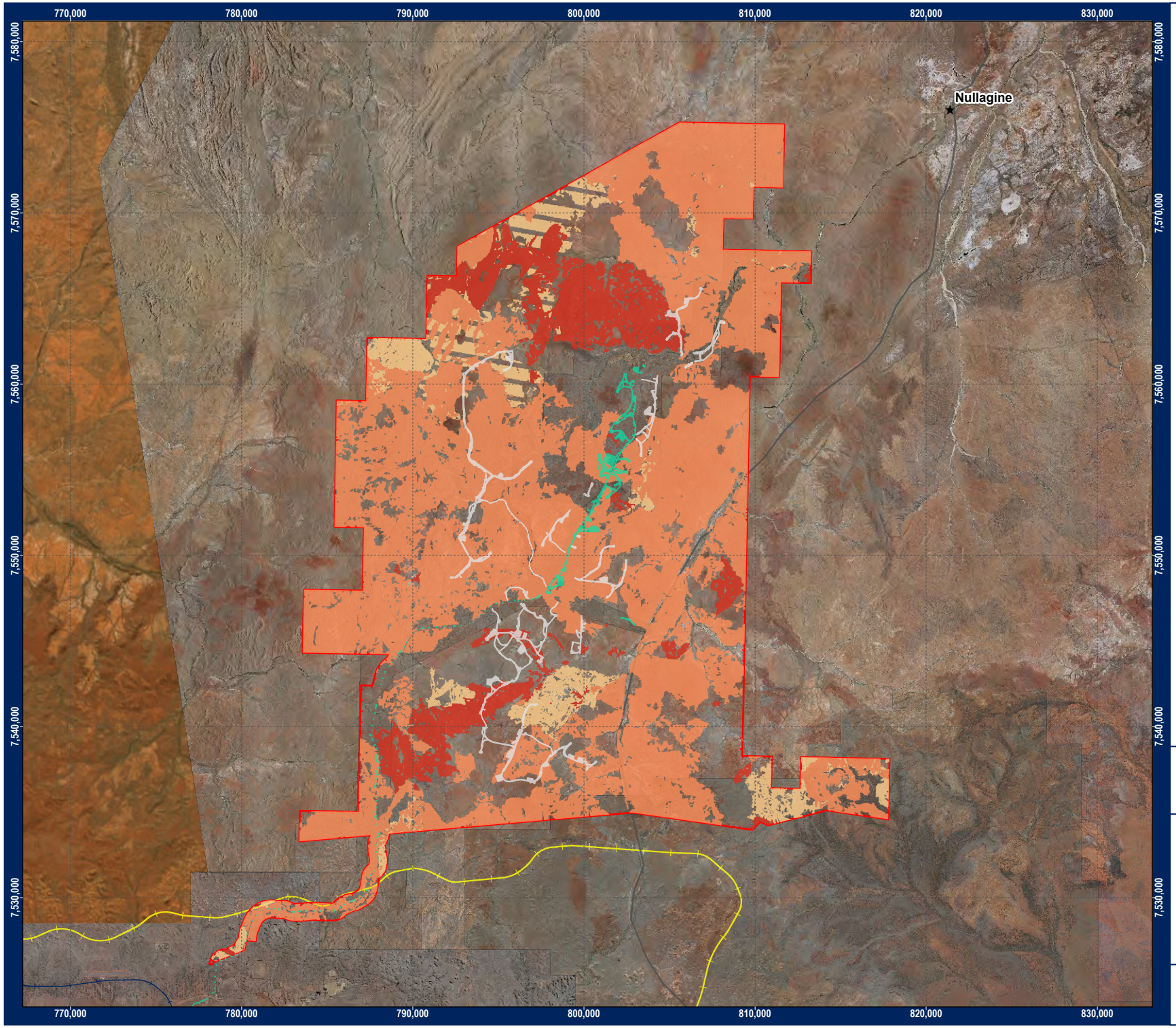

Legend

- Development Envelope
- GOV Towns
- Major Roads
- Fortescue Rail
- Roy Hill Rail
- Indicative Disturbance Footprint
- Approved Disturbance (Nullagine Pilot Wind Farm)

Fire History

- Unburnt
- 2005 - 2009
- 2010 - 2014
- 2015 - 2019
- 2020 - 2024

Data Source(s):
Aerial, Fortescue and ESRI
All other data, Fortescue, 2025

N

0 2 4 6 8 10
Kilometers

Figure 7-7
Fire History
within the Development Envelope

Requested By: R. Dorji
Drawn By: R. Kerr
Revised By: rykerr
Approved By:
Scale: 1:300,000
Coordinate System: GDA 1994 MGA Zone 50
Project Name: 4519OP002_MP_EN_0093_PartIV
Document Name: 4519OP002_MP_EN_0093_013_r1_Fire_History

Date: 1/28/2026
Size: A4L
Revision: 1
Confidentiality: 0

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7.5 Potential Impacts

The Proposal activities that may impact flora and vegetation include:

- Clearing of flora and vegetation in the IDF to accommodate Proposal infrastructure, including access roads, turbine pads, and substations,
- Temporary clearing for the laydown of wind turbines and other infrastructure,
- Disruption of surface water flow, and
- Movement of construction vehicles and machinery around the site.

The potential impacts on flora and vegetation arising from these activities include:

- Direct Impacts:
    - Clearing of up to 910.26 ha of native vegetation. Details on the extent of clearing by vegetation association are provided in Table 7-14. Of this total, 466.86 ha is temporary clearing, 480.81 ha (this includes 13.94 ha of areas previously cleared by other activities not related to this Proposal) will be rehabilitated once construction is complete,
    - Clearing of up to 7.34 ha of riparian vegetation, which includes 3.13 ha of groundwater dependent vegetation and 4.20 ha of potentially groundwater dependent vegetation,
    - Clearing of up to 76.65 ha of the 'Four plant assemblages of the Wona Land System' PEC, sub-community Cracking clays of the Chichester and Mungaroona Range (P1),
    - Clearing of up to 9.61 ha of vegetation which is potentially the 'Four plant assemblages of the Wona Land System' PEC sub-community Cracking clays of the Chichester and Mungaroona Range (P1),
    - Clearing of up to 82.47 ha of significant habitat for Priority flora species,
    - Clearing of 160 individuals of Priority flora species, including:
        - *Neptunia longipila* (P3): 10 individuals,
        - *Paspalidium retiglume* (P2): one individual,
        - *Dolichocarpa* sp. Hamersley Station (A.A. Mitchell PRP 1479) (P3): 23 individuals,
        - *Euphorbia inappendiculata* var. *queenslandic*a (P3): 72 individuals,
        - *Iotasperma sessilifolium* (P3): one individual,
        - *Swainsona thompsoniana* (P3): 18 individuals, and

- *Ptilotus mollis* (P4): 35 individuals.

- Indirect Impacts:
  - Fragmentation of conservation significant flora species habitat,
  - Edge effects[5] on seven conservation significant flora species, totalling 526 individuals from three Priority flora species,
  - Edge effects on 'Four plant assemblages of the Wona Land System' PEC, sub-community Cracking clays of the Chichester and Mungaroona Range (P1) and vegetation which is potentially the 'Four plant assemblages of the Wona Land System' PEC sub-community Cracking clays of the Chichester and Mungaroona Range (P1),
  - Reduced health of riparian vegetation or groundwater dependent vegetation through changes to hydrology and hydrogeology,
  - Introduction or spread of weed species,
  - Increased dust generation and deposition during construction, and
  - Increased risk of bushfire incidents as a result of hot works during construction, or during operations.

- Cumulative impacts:
  - Combined impacts to the remaining extent of pre-European vegetation associations associated with the Proposal and other developments in the surrounding area,
  - Combined clearing of Priority flora species individuals reducing the extent of occurrence of the species or changing its conservation status at a regional or species level,
  - Combined impacts to groundwater dependent vegetation and potentially groundwater dependent vegetation resulting from direct clearing of vegetation associated with the Proposal and other developments in the surrounding area, and
  - Combined impacts to 'Four plant assemblages of the Wona Land System' PEC (P1, P3) resulting from direct clearing of vegetation associated with the Proposal and other developments in the surrounding area.

7.6 Mitigation

During the planning and design process for the Proposal, the mitigation hierarchy (avoid, minimise and rehabilitate) was applied to assess, avoid and minimise potential impacts to flora

[5] Edge effects can occur at the boundary between clearing and the remaining vegetation, including effects associated with increased sunlight and wind; changes in plant and animal communities supported; increased risk of invasive species; or changes in soil composition and water runoff patterns.

and vegetation as far as practicable. Following completion of the Flora and Vegetation survey (SLR, 2024; ecologia, 2025a), the data was reviewed against the project design to avoid/minimise clearing of significant flora and vegetation. The Proposal's IDF has been designed to avoid areas that may support significant biodiversity values or heritage values. Areas that have been avoided, where practicable, include:

- Avoidance of major drainage/creek lines except where crossing locations are required. Consultation with Traditional Owners was undertaken to identify creek crossings to reduce environmental and heritage impacts,
- Avoidance of Threatened flora species: Pilbara Foxglove (*Quoya zonalis*),
- Avoidance of Sheet-flow dependent mulga vegetation, and
- Avoidance of restricted / limited vegetation types as far as practicable.
- Following an iterative design and assessment process, Fortescue have implemented the mitigation hierarchy, and the Proposal has been substantially reduced to avoid impacts wherever possible. This has included significantly reducing the number of turbines from 200 to 100 and implementation of large areas of exclusion zones around important areas of vegetation and habitat throughout the DE. As such, the IDF for the Proposal is less than half that of the originally proposed design.

The mitigation measures in Table 7-12 will be implemented to avoid or minimise impacts on flora and vegetation. An Environmental Management Plan (EMP) has been prepared to outline how the environmental impacts of the Proposal will be monitored, reported and managed for Flora and Vegetation (Appendix B).

Table 7-12: Avoidance, Management and Mitigation of Impacts to Flora and Vegetation

Hierarchy	Management actions
Avoidance	The design has avoided known locations of and Sheet-flow dependent mulga vegetation and Threatened flora species, Pilbara Foxglove (*Quoya zonalis),* through the design refinement of the DE.
	The Proposal has been substantially reduced to avoid impacts wherever possible. This has included significantly reducing the number of turbines from 200 to 100 and implementation of large areas of exclusion zones around important areas of vegetation and habitat throughout the DE. As such, the IDF for the Proposal is less than half that of the originally proposed design which substantially reduces the proposed vegetation clearing form the original Proposal design from 1,911.97 ha to 910.26 ha (including both temporary and permanent clearing).
	Where significant flora or vegetation occurs close to the IDF 'no-go' zones will be demarcated prior to construction activities to protect the conservation significant flora species and vegetation from impacts such as accidental clearing or disturbance.
	Areas to be cleared will be demarcated on the ground (either physically or using GPS enabled methods). Ground disturbance will be undertaken in line with Fortescue's 'Ground Disturbance and Topsoil Management Procedure' (Reference: IO-PR-EN-0010) provided in Appendix C.
Minimisation	All clearing areas will be checked and confirmed post-clearing through inspection of aerial imagery of clearing areas and comparison to the IDF. Site inspection will be undertaken prior to and following clearing to confirm no-go areas are

Hierarchy	Management actions
	appropriately demarcated. Disturbance will be managed using Fortescue's Land Use Certificate system.
	Comprehensive weed hygiene management through implementation of weed management measures ad detailed in the EMP (Appendix B).
	Groundwater abstraction for construction and operational water requirements is approved by and will be managed under GWL171278(7).
	Dust deposition will be managed through standard construction measures (e.g., water application and exposed surface stabilisation) to minimise dust generation and avoid impacts on vegetation. The following standard dust mitigation measures are outlined in the EMP (Appendix B) and will be implemented throughout construction phase: • Use of dust suppression to manage dust generation from construction activities, access roads and cleared areas, • Use of water sprays to manage dust generation from material transport and stockpiling, • Limit the number and height of stockpiles, • Vehicles confined to designated routes with speed limits strictly enforced, and • Adherence to Fortescue's Dust Deposition Monitoring Procedure (Reference: 45-PR-EN-0032).
	Implementation of fire risk management measures are outlined in the EMP (Appendix B) will be undertaken, including: • Clearing activities would not be undertaken when fire danger ratings are extreme or above, • Carefully manage and monitor hot works through implementation of hot works permit system, • Ensuring appropriate disposal of potential fire-starting waste, e.g., cigarette butts, to minimise the risk of bushfires as a result of the Proposal, • Firefighting equipment will be located around the site and in vehicles. Fire response procedures and personnel training, including site inductions on fire prevention and management, will also be provided, and • Maintenance of cleared areas around turbine locations.
Rehabilitation	480.81 ha (this includes 13.94 ha of areas previously cleared by other activities not related to this Proposal) will be progressively rehabilitated once construction is complete to reduce impacts to flora and vegetation over time, including potential fragmentation (as detailed in Table 7-13). This will be undertaken in accordance with Fortescue's standard procedures including Rehabilitation and Revegetation Monitoring Procedure (Reference: 45-GU-EN-0009) provided in Appendix D.

The proposed areas that will be progressively rehabilitated are detailed in Table 7-13.

Table 7-13: Rehabilitated Areas within the Indicative Disturbance Footprint

Vegetation type	IDF (ha)	Rehabilitation (ha)	Permanent Footprint (ha)	DE (ha)	Proportion of residual impact (%)
AaTe	7.69	0.95	6.74	589.26	1.14%
ElAbTl	101.54	54.72	46.82	15,183.93	0.31%
ElGwTe	44.54	22.10	22.44	4,033.24	0.56%
EvAcCc	7.34	4.41	2.93	4,260.76	0.07%
VfAl	86.26	38.32	47.94	6,809.26	0.7%
Mos (AiCpTe1, AiCpTe2 and AiSgTb)	662.89	346.37	316.52	56,633.25	0.56%
Cleared	33.81	13.94	19.87	844.56	2.35%
Total	**944.07**	**480.81**	**463.26**	**88,518.15**	

7.7 Assessment of Impacts

7.7.1 Direct Impacts

7.7.1.1 Clearing of Vegetation

The total clearing of native vegetation expected for the Proposal is 910.26 ha, including 466.86 ha of permanent clearing and 443.39 ha of temporary clearing. The remaining 480.81 ha (this includes 13.94 ha of areas previously cleared by other activities not related to this Proposal) will be rehabilitated once construction is complete. Clearing of vegetation will:

- Reduce the remaining extent of pre-European vegetation associations,
- Reduce areas of specific vegetation types,
- Remove groundwater dependent and riparian vegetation,
- Remove 'Four plant assemblages of the Wona Land System' PEC sub-community Cracking clays of the Chichester and Mungaroona Range (P1) and potential PEC,
- Remove habitat for conservation significant flora,
- Reduce the local extent of vegetation considered to be significant at a Regional level,
- Remove vegetation with culturally significant values (discussed further in Chapter 9 (Social Surroundings)), and
- Remove vegetation that plays a role as a fauna refuge (discussed further in Chapter 8 (Fauna)).

Pre-European Vegetation

Table 7-14 details the expected area of each vegetation association mapped by Beard *et al*. (2013) that will be cleared from the Proposal. According to the 2018 Statewide Vegetation Statistics (DBCA, 2019), these vegetation associations retain more than 99% of their pre-European extent. It is unlikely that their extent has significantly declined (such that they would be below 30% and considered 'in danger') since the 2018 assessment.

The vegetation loss resulting from the Proposal represents a very small fraction of the remaining extent of each association. Consequently, the Proposal will not reduce any vegetation association below the 30% threshold at the State level, within the Pilbara IBRA bioregion, the Chichester and Fortescue subregions, or the Local Government Area (Shire of East Pilbara). Therefore, the clearing of pre-European vegetation associated with the Proposal is not expected to result in a significant impact.

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Table 7-14: Clearing Area Extent of Pre-European Vegetation Associations (DPIRD, 2019)

Vegetation association	Scale	Pre-European extent (ha)	Extent remaining (ha)	Extent within IDF (ha)	Proportion impact (%)	Extent remaining after the Proposal (ha)	Proportion of extent remaining after the Proposal (%)
173	Western Australia	1,753,104.09	1,748,260.83	944.07	0.05%	1,747,316.76	99.9%
	Pilbara IBRA Region	1,752,520.89	1,747,677.63	944.07	0.05%	1,746,733.56	99.9%
	Chichester IBRA Sub-Region	1,744,029.51	1,739,189.58	944.07	0.05%	1,738,245.51	99.9%
	Fortescue IBRA Sub-Region	4,310.96	4,310.96	0.00	0.00%	4,310.96	100.00%
	Shire of East Pilbara	1,085,704.89	1,081,937.46	944.07	0.09%	1,080,993.39	99.9%

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Vegetation Types

The Proposal will clear a total of 910.26 ha of native vegetation, across eight vegetation types. The proposed clearing of native vegetation (910.26 ha) represents 1.02% of the total native vegetation mapped within the DE (89,129.30 ha). The majority of the native vegetation to be cleared (62.94% of the IDF) is within the mosaic vegetation comprising AiCpTe1, AiCpTe2, and AiSgTb.

The Proposal's most significant impact within the DE is to vegetation type AaTe affecting 1.31% of the mapped extent in the DE, followed by the mosaic vegetation (AiCpTe1/AiCpTe2/AiSgTb), VfAl and ElGwTe, affecting 1.17%, 1.27% and 1.10% of the mapped vegetation respectively (Table 7-15). Following the implementation of the Proposal, all vegetation communities within the DE will retain over 97% of their extent mapped by ecologia (2025a) and SLR (2024). Therefore, no vegetation communities are considered at risk as a result of the Proposal.

Vegetation condition within the IDF (Table 7-16) is mainly 'Excellent' (90.86%), with the remainder ranging from 'Very Good' to 'Degraded' (5.55%). A total of 33.81 ha (3.58%) has been previously cleared. Table 7-17 details the clearing of vegetation types by condition.

Table 7-15: Overview of Vegetation Types within the Indicative Disturbance Footprint

Vegetation types	General Vegetation condition	DE (ha)	IDF (ha)	Proportion of impacts within the DE (%)	Extent remaining (%)
AaTe	Excellent	589.26	7.69	1.31%	98.69%
ElAbTl	Very Good to Excellent	15,183.93	101.54	0.67%	99.33%
ElGwTe	Excellent	4,033.24	44.54	1.10%	98.90%
EvAcCc	Degraded to Very Good	4,260.76	7.34	0.17%	99.83%
VfAl	Poor to Excellent	6,809.26	86.26	1.27%	98.73%
Mos (AiCpTe1, AiCpTe2 and AiSgTb)	Poor to Excellent	56,633.25	662.89	1.17%	98.83%
Total*	**-**	**89,973.86**	**944.07**	**1.02%**	**98.95%**

*A total of 844.56 ha within the DE and 33.81 ha within the IDF represent previously cleared areas. A total of 1,455.70 ha of other mapped vegetation types within the DE does not occur within the IDF.

Table 7-16: Overview of Vegetation Condition – Indicative Disturbance Footprint

Vegetation condition	Area within DE (ha)	Area within IDF (ha)	Proportion of impacts within the DE (%)	Extent remaining by condition (%)
Excellent	81,043.21	857.80	1.06%	98.94%
Very Good	3,220.24	20.39	1%	99%
Good	484.83	3.13	0.65%	99.35%
Poor	2,647.51	28.17	1.06%	98.94
Degraded	1,733.51	0.77	0.04%	99.96%
Total*	**89,129.30**	**944.07**	**1.05%**	**98.95%**

*A total of 844.54 ha within the DE and 33.81 ha within the IDF represent previously cleared areas.

Table 7-17: Clearing of Vegetation Types by Condition – Indicative Disturbance Footprint

Vegetation type	Vegetation condition clearing (ha)				
	Excellent	Very Good	Good	Poor	Degraded
AaTe	7.69	-	-	-	-
ElAbTl	99.72	1.82	-	-	-
ElGwTe	44.54	-	-	-	-
EvAcCc	-	1.02	-	5.55	0.77
VfAl	47.97	12.53	3.13	25.62	-
Mos (AiCpTe1, AiCpTe2 and AiSgTb)	657.88	5.02	-	-	-
Total*	**857.80**	**20.39**	**3.13**	**28.17**	**0.77**

*A total of 844.54 ha within the DE and 33.81 ha within the IDF represent previously cleared areas.

Conservation Significant Vegetation

Fourteen vegetation types within the DE represent potentially conservation significant vegetation due to one of the following factors; classified as a PEC (as mapped by DBCA), potentially representative of a PEC, habitat for Priority flora species, play a role in maintaining an important ecological process (i.e., riparian and/or groundwater dependent vegetation and refuge for fauna and flora species) or a locally restricted vegetation. Within the IDF, five vegetation types are considered to be conservation significant vegetation.

One vegetation type (VfAl) within the IDF is consistent with the DBCA listed community Four plant assemblages of the Wona Land System, Cracking clays of the Chichester and Mungaroona Range sub-community (P1). Some portions of VfAl are not included in the DBCA mapped extent of the PEC, but are consistent with the PEC, so are considered potential PEC for the purpose of this assessment. This vegetation type also represents a potential role as refuge and is considered significant for 'maintaining an important ecological process'.

The Proposal will clear up to 86.26 ha of VfAl, including:

- 76.65 ha of 'Four plant assemblages of the Wona Land System' PEC Cracking clays of the Chichester and Mungaroona Range sub-community (P1), and

- 9.61 ha of potential 'Four plant assemblages of the Wona Land System PEC Cracking clays of the Chichester and Mungaroona Range sub-community (P1).

The proportion of impacts within the DE and the DBCA mapped extent of the PEC within a 50 km buffer is described in Table 7-18.

Table 7-18: Clearing of Priority Ecological Community

Priority Ecological Community	Mapped vegetation within IDF (ha)	Mapped vegetation within DE (ha)	Mapped Vegetation within 50 km buffer (ha)**	Impacts within DE (%)	Impacts within 50 km buffer (%)
'Four plant assemblages of the Wona Land System' PEC Cracking clays of the Chichester and Mungaroona Range sub-community (P1)	76.65	5,225.35*	20,808.43	1.47%	0.37%
Potential 'Four plant assemblages of the Wona Land System' PEC Cracking clays of the Chichester and Mungaroona Range sub-community (P1)	9.61	1,583.91		0.61%	0.05%
Total	**86.26**	**6,809.26**	**20,808.43**	**-**	**-**

*Calculated based on the vegetation type VfAl mapped by ecologia (2025a) that overlaps DBCA Database.

**DBCA database without buffer area.

The total clearing of 'Four plant assemblages of Wona Land System' PEC Cracking clays of the Chichester and Mungaroona Range sub-community (P1) represents 1.47% of the mapped extent within the DE and 0.37% of the mapped extent within the 50 km buffer. According to the DBCA database (2025) approximately 13,338.71 ha (64.10%) of this PEC has been mapped within a 50 km buffer from the boundary of the DE. Given the small-scale impact and the remaining PEC area within DE and within 50 km of the DE, the proposed clearing of up to 86.26 ha of VfAl does not represent a significant impact for this vegetation.

Similarly, the clearing of vegetation that is considered a potential PEC represents 0.61% of the vegetation within the DE and 0.05% within a 50 km buffer. If it is assumed that areas of the potential PEC are actually the PEC, the total potential impact on the PEC represents 1.27% of the mapped extent within DE and 0.41% of its mapped extent within 50 km buffer. Given the small-scale impacts and the extent of the PEC in the local and regional area, the impacts on vegetation that is potentially the PEC are not considered significant.

The potential impact to the value of VfAl as a fauna refuge will be assessed in Chapter 8. This vegetation type is predominantly associated with the plain (cracking clays), plain (stony/gibber) and woodland (open) habitat types.

The DE contains 4,349.03 ha of riparian and groundwater dependent vegetation or potentially groundwater dependent vegetation (EvAcCc and EcAcCs). These vegetation types are significant for 'maintaining an important ecological process'. The IDF overlaps 7.34 ha of EvAcCc and does not overlap EcAcCs. The maximum clearing extent in a single location is 2.93 ha, while most of the clearing will be in small areas less than 0.5 ha. Therefore, given the relatively small scale of impact (0.17%), the proposed clearing of riparian/groundwater dependent vegetation is not anticipated to impact on the ability of the remaining vegetation to sustain itself. Further degradation of this vegetation after implementation of the Proposal, is not anticipated.

Four vegetation types within the DE are considered regionally important due to the presence of Priority flora species (AcTe, VfAl ElAbTl, ElGwTe). The majority of Priority flora individuals are concentrated within three of those vegetation types (VfAl, ElAbTl and ElGwTe) divided between five discrete areas of vegetation. The highest proportion of impacts within one discrete area will be 5.21% within Area 1 (VfAl). Area 1 has Priority flora individuals distributed across the discrete area. All other clearing will result in less than 4% of clearing per discrete area (Table 7-20).

As the clearing of 22.62 ha within Area 1 (VfAl) will be divided along approximately 3 km of linear infrastructure and given the small proportion to be cleared within Areas 2 to 5, this small loss of habitat will not significantly impact the ability of the remaining vegetation to support populations of Priority flora species.

The remaining vegetation that contains Priority species (Mos (AiCpTe1/AiCpTe2/AiSgTb), EVAcCc, AcTe and other areas of VfAl) only contain one to three occurrences, as recorded by ecologia (2025a). These vegetation types are therefore not considered a significant vegetation in this instance.

A summary of the potential impacts to conservation significant vegetation is shown in Table 7-19, Table 7-20 and Figure 7-8.

Table 7-19: Potentially Conservation Significant Vegetation within the Indicative Disturbance Footprint

Scale	Significance Criteria	Potentially significant Vegetation Types within IDF	Area within IDF (ha)	Area within DE (ha)	Proportion of impacts (%)
Regional Significance	Presence of potential PEC	VfAl	9.61	1,583.91	0.61%
	Presence of PEC		76.65	5,225.35	1.47%
	Presence of Priority flora species*	AcTe	0	114.54	-
		ElAbTl	47.02	2,383.18	1.97%
		ElGwTe	4.64	125.65	3.69%
		VfAl	Refer to Table 7-20		
	Role in maintaining an important ecological process (i.e., Riparian and/or groundwater dependent vegetation, and fauna and flora refuge)	EvAcCc	7.34	4,260.76	0.17%
		VfAl	86.26	6,809.26	1.27%

*These areas contain only areas of vegetation assessed as conservation significant vegetation.

Table 7-20: Significant Vegetation within the Indicative Disturbance Footprint – Priority Flora Species Habitat

Area	Vegetation type	Species	Individuals	Area (ha)	Clearing within the Area (ha)	Proportion of Impacts (%)
1	VfAl	*Euphorbia inappendiculata* var. *queenslandica* (P3)	878	434.51	22.62	5.21%
		Neptunia longipila (P3)	1			

Area	Vegetation type	Species	Individuals	Area (ha)	Clearing within the Area (ha)	Proportion of Impacts (%)
		Paspalidium retiglume (P2)	100			
2	VfAl	*Euphorbia inappendiculata* var. *queenslandica* (P3)	1	978.48	-	-
3	VfAl	*Euphorbia inappendiculata* var. *queenslandica* (P3)	32	397.31	8.19	2.06%
		Neptunia longipila (P3)	2			
		Swainsona thompsoniana (P3)	755			
4	ElAbTl	*Ptilotus mollis* (P4)	268	2,383.18	47.02	1.97%
		Neptunia longipila (P3)	1			
5	ElGwTe	*Ptilotus mollis* (P4)	898	125.65	4.64	3.69%
6	AcTe	*Acacia cyperophylla var.omearana* (P1)	1,143	114.57*	-	-

*Areas mapped within the DE may exhibit connectivity beyond the Survey Area. Therefore, the entire extent within the DE was considered a discrete area (Area 6).

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Legend

- Development Envelope
- GOV Towns
- Major Roads
- Fortescue Rail
- Roy Hill Rail
- Indicative Disturbance Footprint
- Approved Disturbance (Nullagine Pilot Wind Farm)

Vegetation Type

- AcTe
- ElAbTl
- ElGwTe
- EvAcCc
- Mos
- VfAl

Data Source(s):
Aerial, Fortescue and ESRI
All other data, Fortescue, 2025

N

0 2 4 6 8 10
Kilometers

Figure 7-8
Discrete Areas of Conservation Significant Vegetation - Priority Flora Species Habitat

Requested By: R. Dorji
Drawn By: R. Kerr
Revised By: rykerr
Approved By:
Scale: 1:300,000
Coordinate System: GDA 1994 MGA Zone 50
Project Name: 4519OP002_MP_EN_0093_PartIV
Document Name: 4519OP002_MP_EN_0093_014_r1_Cons_Sig_Veg

Date: 1/28/2026
Size: A4L
Revision: 1
Confidentiality: 0

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Legend

- Development Envelope
- Indicative Disturbance Footprint

Vegetation Type

- VfAl

Data Source(s):
Aerial, Fortescue and ESRI
All other data, Fortescue, 2025

N

0 1 2
Kilometers

Figure 7-8-1
Area 1 of Conservation Significant Vegetation Priority Flora Species Habitat

Requested By: R. Dorji	Date: 1/28/2026
Drawn By: R. Kerr	Size: A4L
Revised By: rykerr	Revision: 0
Approved By:	Confidentiality: 0
Scale: 1:40,000	
Coordinate System: GDA 1994 MGA Zone 50	
Project Name: 4519OP002_MP_EN_0093_PartIV	
Document Name: 4519OP002_MP_EN_0093_014a_r0_Cons_Sig_Veg	

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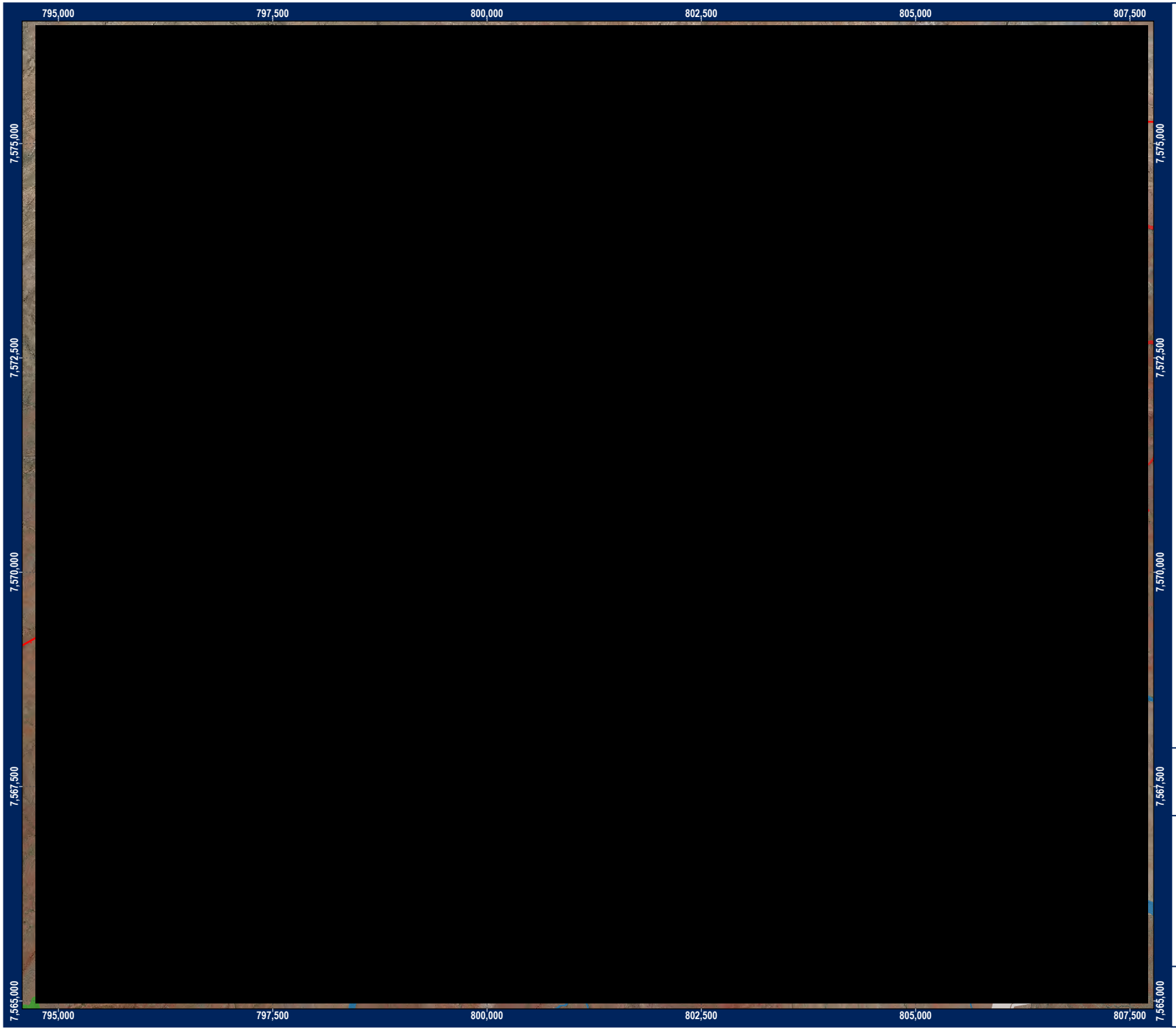

Legend

- Development Envelope
- Indicative Disturbance Footprint

Vegetation Type

- AcTe
- EvAcCc
- VfAl

Data Source(s):
Aerial, Fortescue and ESRI
All other data, Fortescue, 2025

N

0 1 2
Kilometers

Figure 7-8-2
Area 2 of Conservation Significant Vegetation Priority Flora Species Habitat

Requested By: R. Dorji	Date: 1/28/2026
Drawn By: R. Kerr	Size: A4L
Revised By: rykerr	Revision: 0
Approved By:	Confidentiality: 0
Scale: 1:60,000	
Coordinate System: GDA 1994 MGA Zone 50	
Project Name: 4519OP002_MP_EN_0093_PartIV	
Document Name: 4519OP002_MP_EN_0093_014b_r0_Cons_Sig_Veg	

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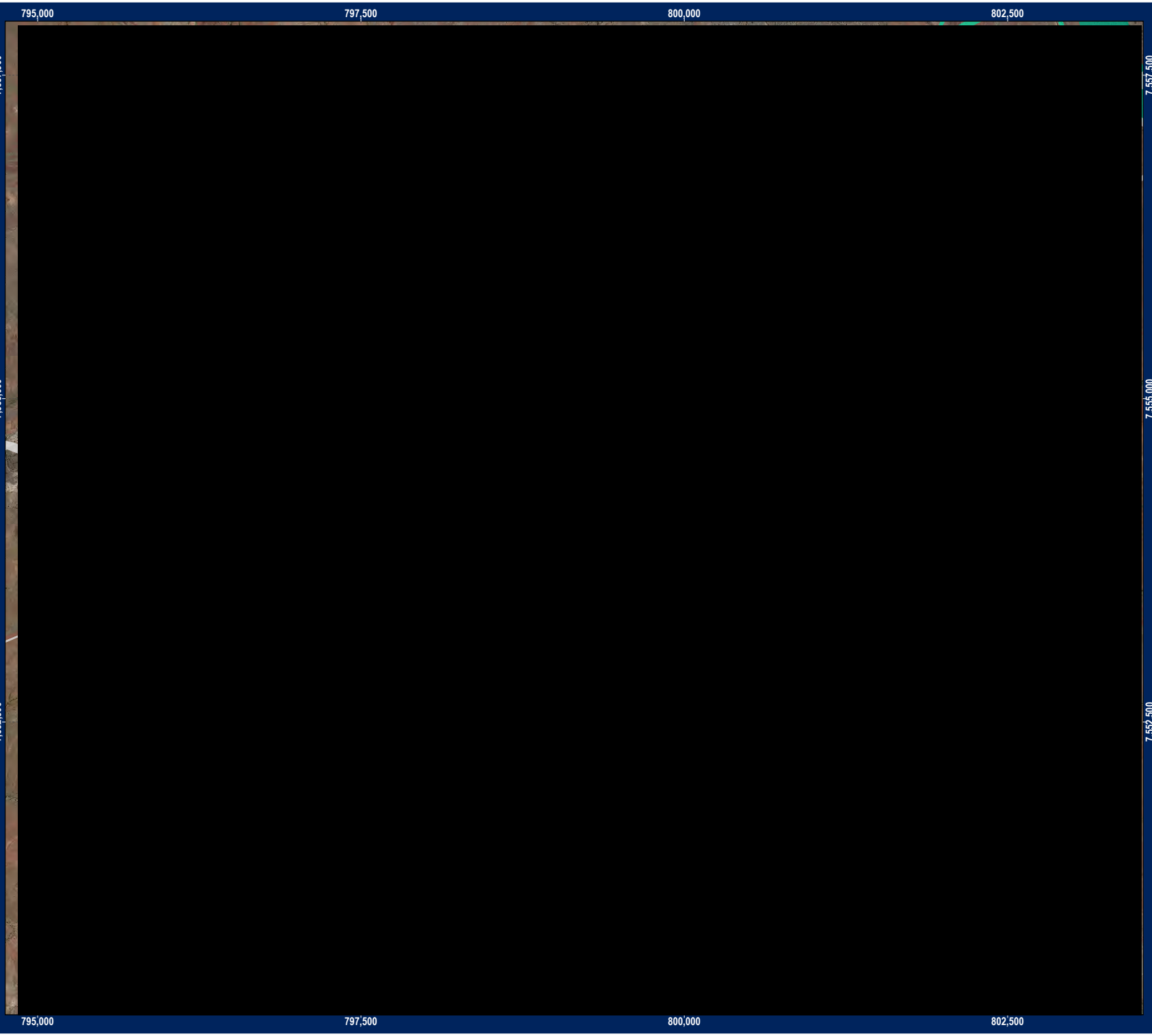

LOCATION MAP

Legend

- Development Envelope
- Indicative Disturbance Footprint
- Approved Disturbance (Nullagine Pilot Wind Farm)

Vegetation Type

- ElAbTl
- ElGwTe
- VfAl

Data Source(s):
Aerial, Fortescue and ESRI
All other data, Fortescue, 2025

N

0 1 2
Kilometers

Figure 7-8-3
Area 3 of Conservation Significant Vegetation Priority Flora Species Habitat

Requested By: R. Dorji
Drawn By: R. Kerr
Revised By: rykerr
Approved By:
Scale: 1:40,000
Coordinate System: GDA 1994 MGA Zone 50
Project Name: 4519OP002_MP_EN_0093_PartIV
Document Name: 4519OP002_MP_EN_0093_014c_r0_Cons_Sig_Veg

Date: 1/28/2026
Size: A4L
Revision: 0
Confidentiality: 0

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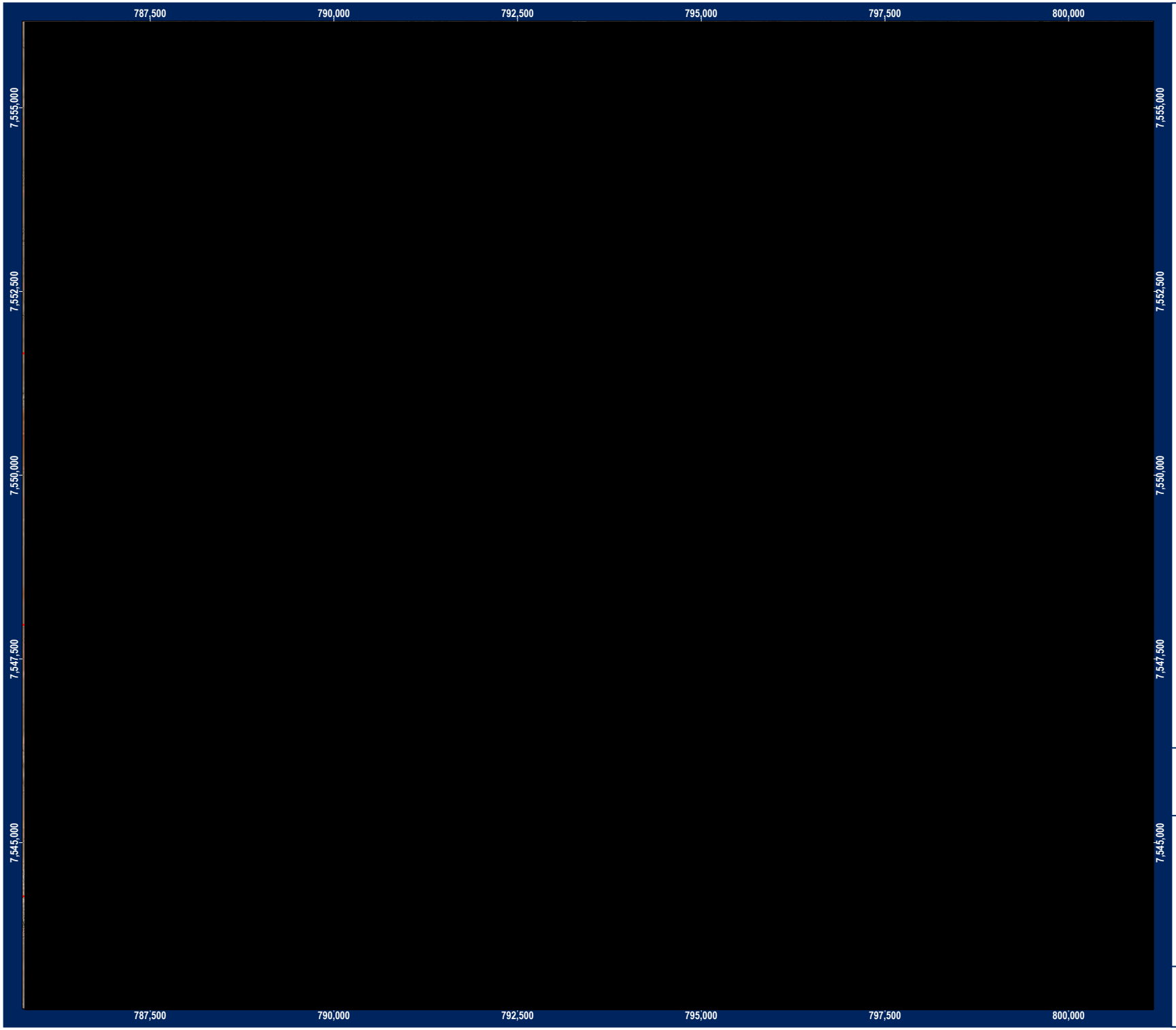

Legend

- Development Envelope
- Indicative Disturbance Footprint
- Approved Disturbance (Nullagine Pilot Wind Farm)

Vegetation Type

- ElAbTl
- Mos
- VfAl

Data Source(s):
Aerial, Fortescue and ESRI
All other data, Fortescue, 2025

N

0 1 2
Kilometers

Figure 7-8-4
Area 4 of Conservation Significant Vegetation Priority Flora Species Habitat

Requested By: R. Dorji
Drawn By: R. Kerr
Revised By: rykerr
Approved By:
Scale: 1:70,000
Coordinate System: GDA 1994 MGA Zone 50
Project Name: 4519OP002_MP_EN_0093_PartIV
Document Name: 4519OP002_MP_EN_0093_014d_r0_Cons_Sig_Veg

Date: 1/28/2026
Size: A4L
Revision: 0
Confidentiality: 0

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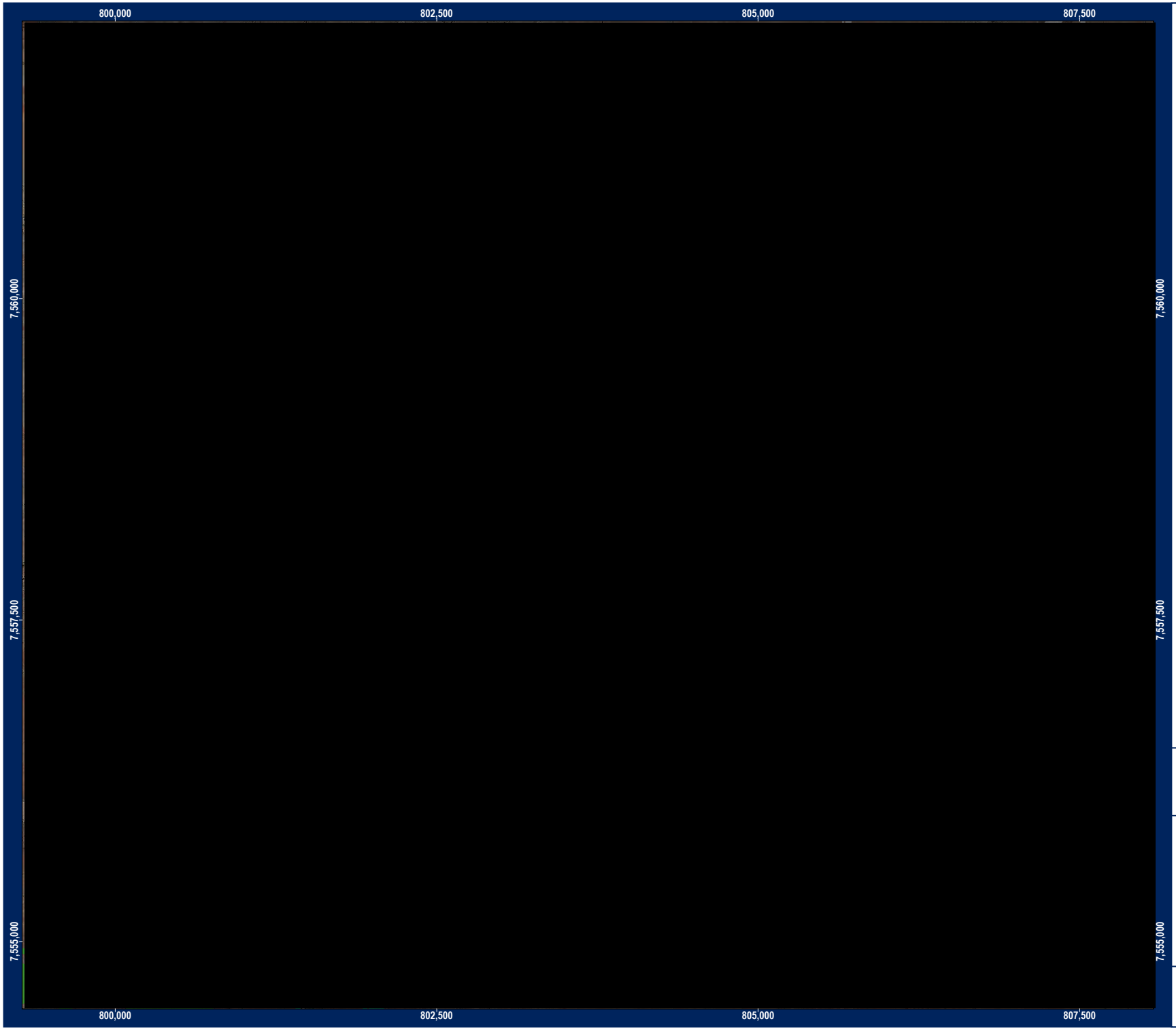

Legend

- Development Envelope
- Indicative Disturbance Footprint
- Approved Disturbance (Nullagine Pilot Wind Farm)

Vegetation Type

- ElGwTe
- VfAl

Data Source(s):
Aerial, Fortescue and ESRI
All other data, Fortescue, 2025

N

0 1 2
Kilometers

Figure 7-8-5
Area 5 of Conservation Significant Vegetation Priority Flora Species Habitat

Requested By: R. Dorji
Date: 1/28/2026
Drawn By: R. Kerr
Size: A4L
Revised By: rykerr
Revision: 0
Approved By:
Confidentiality: 0
Scale: 1:40,000
Coordinate System: GDA 1994 MGA Zone 50
Project Name: 4519OP002_MP_EN_0093_PartIV
Document Name: 4519OP002_MP_EN_0093_014e_r0_Cons_Sig_Veg

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Legend

Development Envelope

Vegetation Type

- AcTe
- EvAcCc
- VfAl

Data Source(s):
Aerial, Fortescue and ESRI
All other data, Fortescue, 2025

N

0 1 2
Kilometers

Figure 7-8-6
Area 6 of Conservation Significant Vegetation Priority Flora Species Habitat

Requested By: R. Dorji	Date: 1/28/2026
Drawn By: R. Kerr	Size: A4L
Revised By: rykerr	Revision: 0
Approved By:	Confidentiality: 0
Scale: 1:40,000	
Coordinate System: GDA 1994 MGA Zone 50	
Project Name: 4519OP002_MP_EN_0093_PartIV	
Document Name: 4519OP002_MP_EN_0093_014f_r0_Cons_Sig_Veg	

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7.7.1.2 Clearing of Conservation Significant Flora Species

Thirteen Priority flora species occur within the DE. Of those, seven Priority flora species are proposed to be directly impacted by the Proposal. Table 7-21 shows the species, number of individuals within the DE, number of individuals within the IDF, and proportion of impacts based on local records (Fortescue and DBCA database records within approximately 50 km buffer of the DE). In addition, there is the potential for accidental clearing of individuals near the IDF. This risk will be managed through clear demarcation of the areas to be cleared (details on demarcation of areas is provided in Section 7.6).

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Table 7-21: Clearing of Conservation Significant Flora Species

Conservation Significant flora species	Individuals (Occurrences) within IDF*	Individuals (Occurrences) within DE*	Individuals (occurrences) within Survey Area*	Total known Individuals (occurrences) within 50 km buffer**	Impacted individuals within DE (%)	Impacted Individuals within 50 km buffer (%)
Paspalidium retiglume (P2)	1 individual (1)	259 individuals (8)	260 individuals (9)	260 individuals (9)	0.39%	0.38%
Dolichocarpa sp. Hamersley Station (A.A. Mitchell PRP 1479) (P3)	23 individuals (3)	750 individuals (25)	750 individuals (25)	751 individuals (26)	3.07%	3.06%
Euphorbia inappendiculata var. *queenslandica* (P3)	72 individuals (6)	1977 individuals (90)	1,977 individuals (90)	2,017 individuals (100)	3.64%	3.57%
Neptunia longipila (P3)	10 individuals (1)	189 individuals (9)	189 individuals (9)	189 individuals (9)	5.29%	5.29%
Swainsona thompsoniana (P3)	18 individuals (3)	977 individuals (41)	997 individuals (42)	1,006 individuals (51)	1.84%	1.79%
Iotasperma sessilifolium (P3)	1 individual (1)	1 individual (1)	1 individual (1)	5 individuals (5)	100.00%	20.00%
Ptilotus mollis (P4)	35 individuals (1)	1174 individuals (43)	1174 individuals (43)	7,705 individuals (311) ***	2.98%	0.45%

*Total number of individuals estimated based on ecologia (2025a).

**Includes records from spatial data provided by DBCA (WAHERB and TPFL), and records from the Fortescue Database (including records from ecologia (2025a) WAHerb records often provide the count (frequency) in descriptors such as common, occasional and scattered without providing an actual number of plants. For the purposes of this assessment these records have been counted as one individual for no comment, five individuals for 'scattered' or 'occasional' or 'uncommon', and 50 individuals for common/frequent/abundant.

***Including a total of 5,919 individuals (238 occurrences) recorded in McPhee Creek Iron Ore Project (Atlas, 2022), 30 km from the DE.

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Paspalidium retiglume (P2)

The proposed clearing of a single individual of *Paspalidium retiglume* represents 0.39% of the total individuals within the DE and 0.38% of individuals within the 50 km buffer. The nearest occurrence is 2 km away from the single individual, indicating no connectivity between these occurrences. Following the proposed clearing, 258 individuals will remain within the DE. As this species prefers clay soils, which are widespread in the region, it may be more prevalent than currently estimated. Given that more than 99% of the recorded individuals within the DE will remain, and it is likely that the species is widespread in suitable habitat in the local area, clearing of one individual of the species is not considered significant.

Dolichocarpa sp. Hamersley Station (A.A. Mitchell PRP 1479) (P3)

The proposed clearing of 23 individuals of *Dolichocarpa* sp. Hamersley Station (A.A. Mitchell PRP 1479) represents 3.07% of the total individuals recorded within the DE and 3.06% of the total individuals within a 50 km buffer. Given the widespread presence of inundated clay soils associated with stony gibber plains in this region, this species is likely to occur frequently in the local area in similar habitat. Direct impacts to *Dolichocarpa* sp. Hamersley Station (A.A. Mitchell PRP 1479) are not considered significant due to the small percentage of individuals impacted and the likely presence of further (unsurveyed) individuals in the region.

Euphorbia inappendiculata var. *queenslandica* (P3)

The proposed clearing of 72 individuals of *Euphorbia inappendiculata* var. *queenslandica* represents 3.64% of the individuals within DE and 3.57% within 50 km buffer. As this species is associated with cracking clay soils, there is a high potential for it to occur more broadly in the local area in similar soils. This is further supported by the high number of individuals recorded within the DE. While there are no previous records of this species in the DE, the high number of individuals recorded during the survey (1,977 individuals) suggests that it is likely to be common in suitable habitat throughout the region. Given this, and the relatively small proportion of impact, the proposed impact to the species is not considered to be significant.

Neptunia longipila (P3)

The proposed clearing of 10 individuals of *Neptunia longipila* represents 5.29% of the total individuals recorded within the DE and the 50 km buffer. The nearest known occurrence is 650 m from the 10 individuals within the DE, suggesting this is a separate sub-population with no, or limited connectivity between them. Following the proposed clearing, 179 individuals will remain within the DE. As more than 90% of recorded individuals will remain, it is unlikely that the proposed clearing will impact the survival of the species at either a local or species level. The proposed impact to *Neptunia longipila* is therefore not considered significant.

Swainsona thompsoniana (P3)

The proposed clearing of 18 individuals of *Swainsona thompsoniana* represents 1.84% of individuals within the DE and 1.79% within the 50 km buffer. The occurrences are located near others (approximately 300 m away) suggesting they belong to the same sub-population. Following the implementation of the Proposal, 959 individuals will remain within the DE. As more than 95% of recorded individuals will remain, it is unlikely that the proposed clearing will impact the survival of the species at the local or species level. The impact to *Swainsona thompsoniana* is therefore not considered significant.

Iotasperma sessilifolium (P3)

The proposed clearing of one individual of *Iotasperma sessilifolium* represents 100% of the individuals within the DE and 20% of occurrences within 50 km buffer. *Iotasperma sessilifolium* has a broad distribution across northern WA, the Northern Territory, western Queensland and northern South Australia. Records in WA are typically associated with surveys undertaken for mining developments, suggesting that additional survey effort in the Pilbara and Kimberly regions, in appropriate habitat, would likely record additional individuals and populations of the species. Additionally, a single individual does not constitute a viable population, with the individual likely to die off naturally with no recruitment occurring. Loss of this individual is therefore unlikely to impact the survival of the species at either a local or species level. The clearing of one individual of *Iotasperma sessilifolium* is therefore not considered significant.

Ptilotus mollis (P4)

The proposed clearing of 35 individuals of *Ptilotus mollis* represents 2.98% of individuals recorded within the DE and 0.45% within 50 km buffer. The closest occurrence is 9 km away from the individuals in the DE, indicating no connectivity between occurrences. Following the Proposal, 1,751 individuals will remain within the DE. As more than 95% of recorded individuals within the DE will remain, it is unlikely that the proposed clearing will impact the survival of the species at either a local or species level. The impact to *Ptilotus mollis* is therefore not considered significant.

7.7.2 Indirect Impacts

7.7.2.1 Fragmentation of Sub-populations

The roads and electrical reticulation forming part of the Proposal are linear in nature and can result in fragmentation of vegetation or flora species populations and/or create edge effects. Habitat fragmentation can interfere with the functional connectivity between individual species if they become separated across an impassable barrier such as preventing the exchange of genes through pollen and seed flow, which is essential for maintaining sufficient genetic diversity and ensuring adaptative potential.

Due to the linear nature of the electrical reticulation and associated road infrastructure, clearing will occur between populations of conservation significant flora species, including *Euphorbia inappendiculate* var. *queenslandica* (P3), *Neptunia longipila* (P3), *Nicotiana umbratica* (P3), *Paspalidium retiglume* (P2), *Ptilotus mollis* (P4) and *Swainsona thompsoniana* (P3). The Threatened and Priority Flora Field Manual (DBCA, 2017b) advises that individuals greater than 500 m from each other are considered separate populations or sub-populations. The IDF will not increase the separation between occurrences in a way that will divide populations and interfere with genetic transfer between those populations.

The clearing associated with the linear elements of the Proposal infrastructure will be up to approximately 50 m wide, it is unlikely this would act as a barrier to dispersal and/or pollination of these species within the DE, particularly where pollination is via wind or birds. In addition, given the nature of the electrical reticulation infrastructure being open span, and the extremely low amount of traffic anticipated on the access roads, it is not anticipated that these elements would act as a physical barrier to pollination within the area.

It is not expected that the Proposal will interfere with genetic connectivity or fragment sub-population of conservation significant flora species. Therefore, no significant impact due to fragmentation of sub-populations is expected.

7.7.2.2 Edge Effects on Conservation Significant Flora Species

Edge effects cause changes in plant communities and flora habitat through abiotic conditions (light, temperature and humidity), preventing dispersal of seeds and potential increase of weeds (Eldegard *et al*., 2015).

There is no established conservation buffer for Priority species within the DE, however the EP Act defines vegetation within 50 m of Threatened flora as an Environmentally Sensitive Area. Therefore, a 50 m buffer from the IDF was used to assess edge effects on the recorded individuals of conservation significant species. This assessment identified the Proposal may indirectly impact three conservation significant flora species (Table 7-22,Figure 7-9). These individuals may be indirectly impacted during operational activities, such as general maintenance activities and movement of vehicles. After the construction phase, 480.81 ha (this includes 13.94 ha of areas previously cleared by other activities not related to this Proposal) will be progressively rehabilitated throughout construction as the works in each area are complete. After the rehabilitation, there is a potential impact to individuals of three conservation significant flora species within the 50 m buffer (Table 7-22).

In a worst-case scenario, the potential loss of those individuals due to edge effects combined with clearing for the Proposal, would result in an increased impact to these populations (Table 7-22). However, edge effects on significant flora species will occur mainly within three areas of vegetation, of which two are dominated by *Euphorbia inappendiculate* var. *queenslandica* (P3) and one by *Ptilotus mollis* (P4). Even in the worst-case scenario, the potential loss of those individuals would not represent an impact that could affect the survival of the species at either a local or species level, given that the edge effects on those populations will not fragment populations or remove individuals or habitat to an extent that the species is unlikely to survive.

The potential edge effects on *Paspalidium retiglume* (P2) may represent a significant loss of individuals recorded within the DE. However, ecologia (2025a) recorded seven other occurrences of this species within the DE, the closest being approximately 4 km from the potentially impacted occurrence. Given the broad distribution of the species within the DE and the expected lack of genetic connectivity between this occurrence and the remaining seven, it is unlikely that the potential loss of this occurrence would negatively affect the survival of the species at either a local or species level.

Indirect impacts related to dust deposition on conservation significant flora is also considered a potential impact. Dust generation during the construction phase will be managed through standard construction site control measures, such as water dust suppression techniques during dust generating activities. Therefore, dust is not anticipated to pose a risk of significant impact to conservation significant flora species in the area. Other impacts relating to dust generation are discussed further in Section 7.7.2.4.

Table 7-22: Conservation Significant Flora Species within 50 m Buffer

Conservation significant species	Individuals within IDF	Individuals within 50 m buffer IDF	Individuals within 50m buffer from Permanent Clearing	Worst-case scenario*; proportion of impact within the DE (%)	Worst-case scenario; proportion of impact within 50 km (%)
Paspalidium retiglume (P2)	1	100	100	39.00%	38.85%
Euphorbia inappendiculata var. *queenslandica* (P3)	72	180	180	12.75%	12.49%
Ptilotus mollis (P4)	35	105	105	11.93%	1.82%

*Worst-case scenario is the potential loss of all individuals within 50 m buffer and those directly impacted by the Proposal.

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Legend

- Development Envelope
- GOV Towns
- Major Roads
- Fortescue Rail
- Roy Hill Rail
- Indicative Disturbance Footprint
- Approved Disturbance (Nullagine Pilot Wind Farm)

Vegetation Type

- Cleared
- AaCpTw
- AaEp
- AaTe
- AaTs
- AcTe
- AeTe
- AhCspYTe
- AmTe
- AoTe
- EcAcCs
- ElAbTl
- ElGwTe
- EvAcCc
- Mos
- VfAl

Data Source(s):
Aerial, Fortescue and ESRI
All other data, Fortescue, 2025

N

0 2 4 6 8 10
Kilometers

Figure 7-9-1
Priority Flora Species
Habitats and Occurrences

Requested By: R. Dorji
Date: 1/28/2026
Drawn By: R. Kerr
Size: A4L
Revised By: rykerr
Revision: 1
Approved By:
Confidentiality: 0
Scale: 1:300,000
Coordinate System: GDA 1994 MGA Zone 50
Project Name: 4519OP002_MP_EN_0093_PartIV
Document Name: 4519OP002_MP_EN_0093_015a_r1_Priority_Flora

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Legend

- Development Envelope
- GOV Towns
- Major Roads
- Fortescue Rail
- Roy Hill Rail
- Indicative Disturbance Footprint
- Approved Disturbance (Nullagine Pilot Wind Farm)

Vegetation Type

- Cleared
- AaCpTw
- AaEp
- AaTe
- AaTs
- AcTe
- AeTe
- AhCspYTe
- AmTe
- AoTe
- EcAcCs
- ElAbTl
- ElGwTe
- EvAcCc
- Mos
- VfAl

Data Source(s):
Aerial, Fortescue and ESRI
All other data, Fortescue, 2025

N

0 2 4 6 8 10
Kilometers

Figure 7-9-2
Priority Flora Species
Habitats and Occurrences

Requested By: R. Dorji
Drawn By: R. Kerr
Revised By: rykerr
Approved By:
Scale: 1:300,000
Coordinate System: GDA 1994 MGA Zone 50
Project Name: 4519OP002_MP_EN_0093_PartIV
Document Name: 4519OP002_MP_EN_0093_015b_r1_Priority_Flora

Date: 1/28/2026
Size: A4L
Revision: 1
Confidentiality: 0

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Legend

- Development Envelope
- GOV Towns
- Major Roads
- Fortescue Rail
- Roy Hill Rail
- Indicative Disturbance Footprint
- Approved Disturbance (Nullagine Pilot Wind Farm)

Vegetation Type

- Cleared
- AaCpTw
- AaEp
- AaTe
- AaTs
- AcTe
- AeTe
- AhCspYTe
- AmTe
- AoTe
- EcAcCs
- ElAbTl
- ElGwTe
- EvAcCc
- Mos
- VfAl

Data Source(s):
Aerial, Fortescue and ESRI
All other data, Fortescue, 2025

N

0 2 4 6 8 10
Kilometers

Figure 7-9-3
Priority Flora Species
Habitats and Occurrences

Requested By: R. Dorji
Date: 1/28/2026
Drawn By: R. Kerr
Size: A4L
Revised By: rykerr
Revision: 1
Approved By:
Confidentiality: 0
Scale: 1:300,000
Coordinate System: GDA 1994 MGA Zone 50
Project Name: 4519OP002_MP_EN_0093_PartIV
Document Name: 4519OP002_MP_EN_0093_015c_r1_Priority_Flora

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7.7.2.3 Introduction and/or Spread of Weed Species

Twenty-five species of introduced flora (weeds) were recorded within the DE (ecologia, 2025a). No WoNs were recorded in the DE, however, one Declared Pest for the Pilbara region under the BAM Act was recorded: **Calotropis procera* (Calotrope). There are no specific management or eradication requirements for this species noted on the WA Organism List database.

Weed species can be spread through the movement of soil or vegetative matter on boots, vehicles and machinery or the movement of topsoil and other bulk earthworks material. Additionally, rehabilitation activities pose a risk of spreading or introducing new weed species due to the re-use or importation of topsoil or other possible contaminated materials, such as tubestock/seedlings.

Construction and operational activities, such as clearing activities, traffic movements, and putrescible wastes, have the potential to introduce or spread weed species within the area.

Standard mitigation measures will be implemented to reduce the risk of introducing new weed species to the DE or spreading those species already present, in line with Fortescue's Weed Management Plan (Reference: 45-PL-EN-0033) provided in Appendix E, and measures outlined in the EMP Appendix B). As such, it is unlikely that new weed species will be introduced and the risk of spreading existing weeds within the DE is considered to be low and no significant impacts are expected to occur to native vegetation.

7.7.2.4 Fragmentation of and edge effects on Priority Ecological Community

Similar to the indirect impacts discussed in Section 7.7.2.2, the 'Four plant assemblages of the Wona Land System' PEC (P1, P3) can also be indirectly impacted by edge effects. This PEC and potential PEC is represented by vegetation type VfAl. Following implementation of the Proposal, 7 patches of this vegetation will be fragmented to one or more areas (Figure 7-10).

There is no established conservation buffer for PECs. However, as a precautionary measure, a 50 m buffer was applied to fragmented vegetation patches in the IDF to assess potential indirect impacts. Based on this approach, the Proposal may indirectly impact 86.26 ha of 'Four plant assemblages of the Wona Land system' PEC or potential 'Four plant assemblages of the Wona Land system' PEC. After construction, 38.32 ha of the total VfAl cleared for Proposal will be progressively rehabilitated, which will decrease the impact of edge effects on the PEC. A total of 230.60 ha (including rehabilitation areas) may be indirectly impacted by the Proposal, following the rehabilitation activities:

- 205.08 ha of 'Four plant assemblages of the Wona Land system' PEC Cracking clays of the Chichester and Mungaroona Range sub-community (P1)[6], and
- 25.52 ha of potential 'Four plant assemblages of the Wona Land system' PEC Cracking clays of the Chichester and Mungaroona Range sub-community (P1)[7].

[6] Vegetation type VfAl that overlaps the area previously mapped by DBCA as the 'Four plant assemblages of the Wona Land System' PEC (P1, P3)
[7] Vegetation type VfAl that does not overlap the area previously mapped by DBCA as the 'Four plant assemblages of the Wona Land System' PEC (P1, P3) and therefore is not confirmed as the PEC.

As described in Table 7-7, the majority of the PEC and potential PEC within the DE is in 'Excellent' to 'Very Good' condition. Therefore, there is a potential that the Proposal will result in a decrease in vegetation condition due to edge effects.

In the worst-case scenario, where edge effects degrade the vegetation to an extent that it no longer can be classified as a PEC, the combined impact of this degradation with the proposed direct clearing, would affect 3.92% of PEC and 1.61% of potential PEC within the DE.

Considering the potential classification of VfAl as a PEC (P1), the worst-case scenario would represent 1.11% of the mapped extent of the PEC (P1) within a 50 km buffer. Therefore, given the regional extent of this vegetation, this loss would not represent a significant impact to this vegetation.

Table 7-23: Edge Effects on Priority Ecological Community

Priority Ecological Community	Area within IDF (ha)	Area within 50m buffer of IDF (ha)	Combined potential impacts (ha)	Proportion of impacts within DE (%)	Proportion of impacts within 50 km buffer (%)
Four plant assemblages of the Wona Land system' PEC (P1)	76.65	128.43	205.08	3.92%	1.11%
Potential Four plant assemblages of the Wona Land system' PEC (P1)	9.61	15.91	25.52	1.61%	
Total	**86.26**	**144.34**	**230.60**		

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Legend

- Development Envelope
- GOV Towns
- Major Roads
- Fortescue Rail
- Roy Hill Rail
- Indicative Disturbance Footprint
- Approved Disturbance (Nullagine Pilot Wind Farm)
- Four plant assemblages of the Wona Land system' PEC (P1, P3)

Vegetation Type

- VfAl

Data Source(s):
Aerial, Fortescue and ESRI
All other data, Fortescue, 2025

N

0 2 4 6 8 10
Kilometers

Figure 7-10
Edge Effects on
Priority Ecological Communities

Requested By: R. Dorji
Drawn By: R. Kerr
Revised By: rykerr
Approved By:
Scale: 1:300,000
Coordinate System: GDA 1994 MGA Zone 50
Project Name: 4519OP002_MP_EN_0093_PartIV
Document Name: 4519OP002_MP_EN_0093_016_r1_Edge_Effects

Date: 1/28/2026
Size: A4L
Revision: 1
Confidentiality: 0

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7.7.2.5 Indirect impacts on Riparian or Groundwater Dependent Vegetation

Surface hydrologic process is often correlated to groundwater depth dynamics and represent an important component of ecohydrological characteristics that control groundwater-dependent vegetation (Peng *et al*., 2024). Therefore, alterations in the hydrological process within the DE may impact groundwater dependent vegetation.

A post-development hydrological assessment (Fortescue, 2024) and baseline hydrology and qualitative impact assessment (Fortescue, 2025) were carried out to evaluate the potential changes to the existing surface water flow regime as a result of the Proposal (Refer to Chapter 10.1 for a complete impact assessment). Note these studies were completed for a much larger disturbance footprint than the current Proposal (which has subsequently been reduced through implementation of the mitigation hierarchy to avoid environmental values), and therefore report a substantially worse case in terms of impacts than the Proposal.

It was concluded that the construction of turbines, access track/waterway crossing, minor and major crossing on creek hydrology, and associated Proposal infrastructure, are not expected to significantly impact surface water flows (Fortescue, 2025; 2024).

Changes to the surface water flow regime are expected to be localised and limited to areas near turbine access tracks and waterway crossings. Minor crossings are anticipated to have low impacts on creek hydrology and morphology, while impacts from major crossings are expected to remain confined to the immediate vicinity of the structures (Fortescue, 2024b). Potential minor localised impacts on Riparian or Groundwater Dependent Vegetation will be regulated under other legal instruments, including the MDCP required under the *Mining Act 1978* which regulates potential indirect impacts on vegetation as a result of the Proposal. An example of this is the Nullagine pilot wind farm project within the DE (MDCP REG ID 500678) that was approved in 2025. Through this process, potential indirect impacts on Riparian or Groundwater Dependent Vegetation will be minimised and will not be significant.

7.7.2.6 Dust Deposition

Dust deposition on vegetation can affect photosynthesis through interception of solar radiation, alteration of the radiant energy balance, and act as a barrier to gas diffusion on leaf surfaces (Doley, 2020). Research shows that the impact of dust depends on leaf traits like surface roughness and posture. Leaves with traits that accumulate less dust (flat, smooth leaves) experience more stress as dust interferes with gas exchange (Turner, 2013). Dust deposition impact decreases with distance from the source (Matsuki *et al*., 2016).

There is no publicly available assessment of dust impacts on the conservation significant flora species that occur within the DE. However, monitoring undertaken by Matsuki *et al*. (2016) in other regions of WA did not find evidence to support that dust accumulation on plants causes negative impacts at rates up to 20 to 77 g/m^2 per month. Dust generated from the construction activities will be managed in accordance with Fortescue's Dust Management Plan (IO-PL-EN-0001) and is not expected to pose a risk to native vegetation.

In addition, the majority of potential dust impacts associated with the Proposal will occur during construction activities, which will be short-term, temporary, and localised. Dust generation from operational activities is anticipated to be minimal and limited to vehicle movements, which are infrequent. It is therefore considered that dust impacts to flora will be negligible. Further, the EMP prepared for the Proposal will include standard mitigation measures to reduce dust generation (Appendix B).

7.7.2.7 Increased Risk of Bushfires

Wind turbines pose a risk of fire incidents, mostly associated with lightning strikes (acting as conductors) and mechanical failures, often exacerbated by the presence of combustible material (You *et al*., 2023). Similarly, electrical reticulation lines can cause wildfires through failures, pole top or transformer fires and outages from wildfires (Panossian & Elgindy, 2023).

Climate projections for northern Australian Rangelands, including the Pilbara, suggest that temperatures will continue to rise. By 2030, the mean annual warming across all emissions scenarios is projected to be about 0.6 to 1.4°C above the climate of 1986–2005. By 2090, temperatures are projected to be 1.5 to 2.9°C warmer under an intermediate emissions scenario (RCP 4.5) (DWER, 2021d). A substantial increase in the temperature reached on the hottest days and the frequency of hot days is projected. Given these projections, it is anticipated that the bushfire risk and intensity of events will increase in response to the changing climate, which could further exacerbate the risks associated with the Proposal.

Increased frequency and intensity of fire incidents can affect vegetation through removal or reduction of biomass, alteration of vegetation structure, increase of weeds due to decrease of competition for resources and alteration of seed dispersal and germination, consequently affecting the vegetation composition within the affected area (Stavi, 2019; Fisher *et al*., 2009). Given the regular wildfire activity in the region as discussed in Section 7.4.10, fuel loads are considered to be generally low across the entire DE. Fire risk will be managed in accordance with Fortescue standard control measures, which aim to minimise risks as far as practical. In addition, the 2 ha cleared areas around the turbine locations are anticipated to reduce the risk of fire from lightning strikes. Therefore, increased risk of bushfires associated with the Proposal is not expected to pose a significant risk to native vegetation.

7.7.3 Cumulative Impacts

Cumulative environmental impacts are the successive, incremental, and interactive impacts on the environment of a Proposal with one or more past, present and reasonably foreseeable future activities (EPA, 2021b). This section outlines the potential cumulative impacts to flora and vegetation values as a result of the Proposal and other surrounding developments either recently approved or currently under EPA assessment.

In undertaking a cumulative impact assessment, the following assumptions are noted:

- Cumulative impacts resulting from third-party operations are based on information available in the public domain for third party operators and does not encapsulate impacts for all third-party operations in the region,
- Cumulative impact calculations generally do not take into consideration areas outside of those assessed under Part IV of the EP Act, or EPBC Act referrals, for each relevant proposal. Where relevant, large clearing permits under Part V of the EP Act may also be included depending on the quantity and quality of information available, and
- The accuracy of data from external sources will not be verified and it is assumed that data publicly available is accurate and collected in accordance with standard industry guidelines.

Cumulative impacts have been considered against the following flora and vegetation aspects:

- Pre-European vegetation associations (Beard *et al*. 2013)[8],
- Conservation significant flora,
- Groundwater dependent vegetation, and
- Priority Ecological Community – 'Four plant assemblages of the Wona Land System' (P1, P3).

There are several reasonably foreseeable developments within the Proposal region and, more broadly, within the Chichester and Fortescue subregions of the Pilbara bioregion. Although not directly comparable proposals, they involve removal of native vegetation. In the cumulative impact assessment process, the spatial boundaries depend on the area of influence for the specific impact being considered.

For the assessment of cumulative impacts to conservation flora species, the projects were selected based on the following criteria:

- Proposals assessed and submitted between 2019 and 2026 (assumed to be 'reasonably foreseeable future activities' as proposals would generally be conditioned to commence implementation within five years of approval and are otherwise anticipated to be included in the existing environment data),
- Proposals within 10 km buffer from current known occurrences (ALA, 2025), and
- Proposals that haven't started pre-construction activities yet.

For the assessment of cumulative impacts to vegetation, including the PEC and groundwater dependent vegetation, relevant projects within the Chichester subregion were selected.

Conservation significant flora species

A total of eight projects contribute to cumulative impacts on one or more of the conservation significant flora species identified within the DE:

- Nullagine Pilot Wind Farm Project
- Corunna Downs Project,
- Eliwana Railway Project,
- Eliwana Iron Ore Mine Project,
- Hope Downs 2,
- McPhee Creek Iron Ore Project,

[8] Given the differences in surveyors, methodologies and mapping between projects, direct comparison of the vegetation mapping between schemes is not always achievable. In order to determine the cumulative impacts, a comparison against the Beard vegetation associations remaining extents has been undertaken to provide a regional assessment.

- North Star Magnetite Project Extension,
- Sulphur Springs Zinc-Copper Project, and
- Mulga Downs Hub and Rail Spur.

The conservation significant flora species, *Paspalidium retiglume* (P2) and *Iotasperma sessilifolium* (P3) were not included in the cumulative assessment. The clearing of one individual of each of these species as a result of the Proposal will not increase the cumulative impacts to a significant extent. A single, isolated individual cleared by the Proposal is unlikely to represent a viable population and will not contribute to the flow of genetic information between populations.

The cumulative impacts on conservation significant flora species anticipated to occur as a result of this Proposal and the projects mentioned above are identified in Table 7-24.

Table 7-24: Impacts to Conservation Significant Flora Species Associated with Other Surrounding Projects

Reported Direct Impacts - Significant flora impacted that is common between the cumulative projects					
Projects	***Neptunia longipila* (P3)**	***Dolichocarpa* sp. Hamersley Station (A.A. Mitchell PRP 1479) (P3)**	***Euphorbia inappendiculata* var. *queenslandica* (P3)**	***Ptilotus mollis* (P4)**	***Swainsona thompsoniana* (P3)**
The Proposal	10 individuals	23 individuals	72 individuals	35 individuals	18 individuals
Nullagine Pilot Wind Project	Not directly impacted.	Not directly impacted.	Not directly impacted.	Not directly impacted.	Not directly impacted.
Corunna Downs Project (58 km from the Proposal)	Not directly impacted.	Not directly impacted.	Not directly impacted.	Not directly impacted.	1 individual
Eliwana Iron Ore Mine Project (250 km from the Proposal)	Not directly impacted.	Not directly impacted.	Not directly impacted.	193 individuals	Not directly impacted.
Eliwana Railway Project (190 km from the Proposal)	Not directly impacted.	Not directly impacted.	5 individuals	2 individuals	1 individual
Hope Downs 2 (97 km from the Proposal)	Not directly impacted.	Not directly impacted.	Not directly impacted.	45 individuals	Not directly impacted.
McPhee Creek Iron Ore Project (30 km from the Proposal)	Not directly impacted.	Not directly impacted.	Not directly impacted.	842 individuals	Not directly impacted.
Mulga Downs Hub and Rail Spur (76 km from the Proposal)	Not directly impacted.	2 individuals	Not directly impacted.	Not directly impacted.	Not directly impacted.
North Star Magnetite Project Extension (108 km from the Proposal)	Not directly impacted.	Not directly impacted.	Not directly impacted.	101 individuals	Not directly impacted.
Sulphur Springs Zinc-Copper Project (110 km from the Proposal)	Not directly impacted.	Not directly impacted.	Not directly impacted.	1 individual	Not directly impacted.
Total Impacts	**10 individuals**	**25 individuals**	**77 individuals**	**1,219 individuals**	**20 individuals**
Total Known Records	**9**	**2,553**	**2,843**	**22,607**	**6,003**

Reported Direct Impacts - Significant flora impacted that is common between the cumulative projects					
Projects	***Neptunia longipila* (P3)**	***Dolichocarpa* sp. Hamersley Station (A.A. Mitchell PRP 1479) (P3)**	***Euphorbia inappendiculata* var. *queenslandica* (P3)**	***Ptilotus mollis* (P4)**	***Swainsona thompsoniana* (P3)**
Estimated number of individuals*	**690**	**2,553**	**2,843**	**22,607**	**6,003**
% Cumulative Impact	**1.5%**	**1.0%**	**2.7%**	**5.4%**	**0.3%**

* The total number of individuals is not documented for many of the priority species, therefore for the purposes of this assessment, the total number of individuals has been estimated based on (TPLF and WA Herbarium 2025 data within 50km of the DE, Fortescue's database records beyond 50km, and publicly available data in documentation from other Proposals in the region).

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Vegetation

A total of five projects contribute to cumulative impacts on pre-European vegetation, Groundwater dependent vegetation and Four plant assemblages of the Wona Land System (PEC P1, P3):

- Nullagine Pilot Wind Farm
- Mulga Downs Hub and Rail Spur,
- Mulga Downs Iron Ore Mine,
- North Star Magnetite Project Extension, and
- Sulphur Springs Zinc-Copper Project.

The cumulative impacts on vegetation anticipated to occur as a result of this Proposal and the projects mentioned above are identified in Table 7-25.

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Table 7-25: Impacts to Vegetation Associated with Other Surrounding Projects

The Proposal and cumulative projects	Reported direct impacts to vegetation		
	Vegetation association removal that is common between the cumulative projects	GDV and potential GDV	Four plant assemblages of the Wona Land System (PEC P1, P3)
The Proposal	Chichester (173) – 944.07 ha	7.34 ha	86.26 ha*
Nullagine Pilot Wind Farm	Chichester (173) – 318.77 ha	11.5 ha	None directly impacted
McPhee Creek Iron Ore Project (30 km distant from the Proposal)	Chichester (173) - 590.2 ha The remaining proposed clearing is within Chichester (171) and therefore not anticipated to cause combined impacts on any other vegetation associations.	24.0 ha	None directly impacted
Mulga Downs Hub and Rail Spur (76 km distant from the Proposal)	Chichester (173) – 808.11 ha The remaining proposed clearing is within Chichester (93, 175) and Fortescue (29) and therefore not anticipated to cause combined impacts on any other vegetation association.	101.55 ha	344.26 ha
North Star Magnetite Project Extension (108 km distant from the Proposal)	All proposed clearing is within Chichester (82) and therefore not anticipated to cause combined impacts on a vegetation association.	20.1 ha	None directly impacted
Sulphur Springs Zinc-Copper Project (110 km distant from the Proposal)	All proposed clearing is within Chichester (82 and 93) and therefore not anticipated to cause combined impacts on a vegetation association.	9.7 ha	None directly impacted
Total cumulative Impact	**Chichester (173) – 2,661.15**	**174.19 ha**	**430.52 ha**
Total Known Extent	**Chichester (173) – 1,739,189.58 ha**	**N/A**	**94,005.20 ha**
% Cumulative Impact	**Chichester (173) – 0.15 %**	**N/A**	**0.46** %

*86.26 ha includes PEC and potential PEC mapped by ecologia (2025a).

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The potential cumulative impacts on the pre-European extent of vegetation remaining in the Chichester and Fortescue subregions are:

- Chichester subregion:
    - Clearing of 2,661.15 ha of vegetation association 173, and

The National Objectives and Targets for Biodiversity Conservation includes a target to avoid further clearing of vegetation of any vegetation association with a pre-European extent of below 30% (Commonwealth of Australia, 2001).

More than 99% of vegetation association 173 (Chichester) would remain even when accounting for cumulative clearing. Given that the combined impacts on this pre-European vegetation will not decrease the vegetation association below 30% at any scale, impacts are not anticipated to be significant.

The combined direct impacts to 'Four plant assemblages of the Wona Land System' PEC Cracking clays of the Chichester and Mungaroona Range sub-community (P1) as a result of implementation of the Proposal and the other projects will result in the cumulative removal of 430.52 ha of this PEC. While it is not explicitly stated in the Mulga Downs Hub and Rail Spur documentation, it is assumed that the sub-community impacted by this project is the Cracking clays of the Chichester and Mungaroona Range, due to the project location and reference to the PEC as P1.

The DE contains over 6,809.26 ha of the mapped extent of this PEC, with DBCA database recording 13,338.71 ha outside of the DE within a 50 km buffer. It should be noted that the DBCA mapping does not define areas by sub-community. The total mapped extent of the PEC is over 94,000 ha, of which the total cumulative clearing reported in Table 7-25 represents just 0.46%. Given the mapped extent of the PEC (P1 and P3 areas) in the DE, and much larger total mapped extent compared to the cumulative impacts, the combined clearing is not anticipated to result in a significant cumulative impact.

The combined direct impacts to riparian and groundwater dependent vegetation will result in removal of 174.19 ha, although the actual impact is likely to be lower. The local areas surrounding the projects considered in the cumulative assessment likely contain a large amount of groundwater dependent vegetation, with the DE containing over 4,349.03 ha and the other projects in the assessment containing at least 3,061.50 ha. Therefore, given that the cumulative impacts have a relatively small-scale combined clearing (2.35% of likely GDV), clearing in any one area is small, and waterways in the region are generally well vegetated, the cumulative impact is not considered to be significant.

Four conservation significant flora species may be subject to cumulative impacts as detailed in Table 7-24: *Dolichocarpa* sp. Hamersley Station (A.A. Mitchell PRP 1479) (P3), *Euphorbia inappendiculata* var. *queenslandica* (P3), *Swainsona thompsoniana* (P3) and *Ptilotus mollis* (P4).

A total of 25 individuals of *Dolichocarpa* sp. Hamersley Station (A.A. Mitchell PRP 1479) (P3) will be impacted. The cumulative impact to *Dolichocarpa* sp. represents only 1.0% of the estimated individuals in the region (Refer to Table 7-24), which is not considered significant.

Other proposals will impact only one to five individuals of *Euphorbia inappendiculata* var. *queenslandica* (P3) and *Swainsona thompsoniana* (P3). The combined cumulative impacts on

these species represents 2.7% and 0.3%, respectively (Table 7-24) and is therefore not considered a significant regional impact.

The total clearing of 1,219 individuals of *Ptilotus mollis* (P3) represents 5.4% of the current estimated number of individuals (22,607 individuals) (Table 7-24). The cumulative impact on this species is not considered a significant impact in a regional context, given that this species is widespread in the Pilbara region, typically growing on steep rocky slopes (ecologia, 2025a) and associated with *Acacia* and *Triodia* dominated plant communities (Hammer *et al*., 2020), which are common plants in Pilbara (DPIRD, 2023). The combined direct impacts are not expected to increase the conservation status of the species or impact its long-term survival.

Cumulative impacts to flora and vegetation are typically predominantly associated by direct clearing footprints, with indirect effects (dust, weed spread, disease transfer and edge-related condition decline) generally localised and diminishing rapidly with distance. As discussed in Section 7.7.2, indirect impacts from the proposal are not anticipated to be significant and with standard good-practice controls outlined in the EMP (Appendix B) (e.g. defined access, hygiene/clean-down, dust suppression, drainage/erosion controls and weed monitoring) the likelihood and magnitude of indirect pathways will be minimised such that no measurable change in vegetation condition or important flora habitat quality is anticipated. Given the spatial separation from other foreseeable surrounding proposals and the absence of mechanisms for a material hydrological or chronic disturbance change at recorded flora and native vegetation, indirect cumulative impacts are unlikely to be significant. The indirect cumulative impacts are not anticipated to reduce the species' extent of occurrence/area of occupancy, fragment populations, or disrupt key processes (pollination, seed set, dispersal) through vegetation degradation.

7.8 Environmental Outcomes

Table 7-26 summarises the expected environmental outcomes for the Proposal, following the implementation of mitigation and management measures. The environmental outcomes proposed are mainly outcome-based conditions. However, environmental objectives are proposed in some cases as there are several factors outside Fortescue's control that will influence an outcome. These cases require an assessment from a subject matter expert to assess whether the objectives are achieved.

Table 7-26: Summary of Residual Impacts for Flora and Vegetation after Mitigation Measures

Potential impact	Residual impact after management	Residual impact significance	Proposed Environmental Outcomes
Clearing of native vegetation	Clearing of 881.32 ha with 'Good to Excellent' condition.	**Potential Significant Residual Impact** Vegetation types and vegetation associations, as per Beard (1975), will not be cleared to an extent to reduce the remaining vegetation below 30%. However, the permanent loss of 'Good to Excellent' vegetation condition is expected to be significant. An environmental offset is proposed for this residual impact.	**FV-1 Environmental Outcome:** Clearing no more than 910.26 ha of native vegetation (including 881.32 ha of 'Good to Excellent') within DE, of which no less than 480.81 ha will be rehabilitated. **Management of potential impacts from clearing of native vegetation can be regulated under Part V of the EP Act.**
Clearing of conservation significant vegetation	176.04 ha of Regionally Significant vegetation will be cleared, including: • 76.65 ha of 'Four plant assemblages of the Wona Land System' PEC (P1), and • 9.61 ha of Potential 'Four plant assemblages of the Wona Land System' PEC (P1). • Groundwater dependent vegetation: 3.1 ha. • Potential groundwater dependent vegetation: 4.2 ha.	**Not a Significant Residual Impact** The total clearing represents 1.01% of the mapped Vegetation Types within the DE, including: • 1.47% of the 'Four plant assemblages of the Wona Land System' PEC (P1, P3) within the DE, and • 0.6% of the Potential 'Four plant assemblages of the Wona Land System' PEC. Given that the 'Four plant assemblages of the Wona Land System' PEC (P1) is well represented within the DE and surrounding areas and more than 98% of the extent of the PEC within the DE will remain, it is not expected to have a significant residual impact.	**FV-2 Environmental Outcome:** The implementation of the proposal will not result in the change of conservation status of identified conservation significant vegetation. Including: • Direct disturbance of no more than 76.65 ha of 'Four plant assemblages of the Wona Land System' PEC (P1), • Direct disturbance of no more than 9.61 ha of potential 'Four plant assemblages of the Wona Land System' PEC (P1), • Direct disturbance of no more than 3.13 ha of groundwater dependent vegetation, • Direct disturbance of no more than 4.20 ha of potential groundwater dependent vegetation,

Potential impact	Residual impact after management	Residual impact significance	Proposed Environmental Outcomes
	• 82.48 ha of habitat for Priority flora species within four vegetation types: ○ 22.62 ha of Area 1 (VfAl), ○ 8.19 ha of Area 3 (VfAl), ○ 47.02 ha of Area 4 (ElAbTl), and ○ 4.64 ha of Area 5 (ElGwTe).	**Not a Significant Residual Impact** The clearing of GDV represents 0.11% of this vegetation type within the DE. Therefore, it is not expected to be a significant residual impact. **Not a Significant Residual Impact** The clearing of potential GDV represents 0.28% of this vegetation type within the DE. Therefore, it is not expected to be a significant residual impact. **Not a Significant Residual Impact** The clearing of Priority flora species habitat represents a maximum of: • 5.21 % of Area 1 (VfAl), • 2.06% of Area 3 (VFal),VfAl) • 1.97% of Area 4 (ElAbTl), • 3.69% of Area 5 (ElGwTe), and Given the small-scale of impacts, compared with the total area of the Area, it is unlikely to represent a significant residual impact for Priority flora species habitat.	• Direct disturbance of no more than 82.47 ha of habitat for significant Priority flora species , including: ○ 22.62 ha of Area 1 (VfAl), ○ No disturbance of Area 2 (VfAl) ○ 8.19 ha of Area 3 (VfAl), ○ 47.02 ha of Area 4 (ElAbTl), ○ 4.64 ha of Area 5 (ElGwTe), and ○ No disturbance of Area 6 (VfAl)

Potential impact	Residual impact after management	Residual impact significance	Proposed Environmental Outcomes
Clearing of conservation significant flora species	Clearing of seven conservation significant flora species, including: • *Paspalidium retiglume* (P2): 1 individual, • *Neptunia longipila* (P3): 10 individuals, • *Dolichocarpa* sp. Hamersley Station (A.A. Mitchell PRP 1479) (P3): 23 individuals, • *Euphorbia inappendiculata* var. *queenslandica* (P3): 72 individuals, • *Iotasperma sessilifolium* (P3): 1 individual, • *Swainsona thompsoniana* (P3): 18 individuals, and • *Ptilotus mollis* (P4): 35 individuals.	**Not a Significant Residual Impact** The clearing of 23 individuals of *Dolichocarpa* sp. Hamersley Station (A.A. Mitchell PRP 1479) (P3) represents 3.07% of the total individuals within the DE and 3.06% of the total individuals within a 50 km buffer. Following the proposed clearing, 727 individuals will remain within the DE. As more than 96% of recorded individuals within the DE and within 50 km buffer will remain, it is unlikely that the proposed clearing will impact the survival of the species at either a local or species level. The impact to *Dolichocarpa* sp. Hamersley Station (A.A. Mitchell PRP 1479) (P3)) is therefore not considered significant. **Not a Significant Residual Impact** The direct clearing of 72 individuals *of Euphorbia inappendiculata* var. *queenslandica* (P3) represents 3.64% of the individuals within DE and 3.57 % of individuals within 50 km buffer. Following the proposed clearing, 1,905 individuals will remain within the DE. As more than 96% of recorded individuals within the DE and within 50 km buffer will remain, it is unlikely that the proposed clearing will impact the survival of the species at either a local or species level. The impact to *Euphorbia inappendiculata* var. *queenslandica (*P3) is therefore not considered significant. **Not a Significant Residual Impact** The direct clearing of one individual of *Iotasperma sessilifolium* (P3) represents 100% of the individuals within the DE and 20% of	**FV-3 Environmental Outcome:** No direct or indirect disturbance to the Threatened flora species *Quoya zonalis*. **FV-4 Environmental Outcome:** The implementation of the proposal will not result in the change of conservation status of identified conservation significant flora species. Including: • No more than 0.4% of *Paspalidium retiglume* (P2) will be cleared, • No more than 5.3% of *Neptunia longipila* (P3) will be cleared, • No more than 3.1% of *Dolichocarpa* sp. Hamersley Station (A.A. Mitchell PRP 1479) (P3) will be cleared, • No more than 4.0% of *Euphorbia inappendiculata* var. *queenslandica* (P3) will be cleared, • No more than 20% of *Iotasperma sessilifolium* (P3) will be cleared, • No more than 2.0% of *Swainsona thompsoniana* (P3) will be cleared, • No more than 0.5% of *Ptilotus mollis* (P4) will be cleared, Note: Percentages are based on recorded individuals within a 50 km buffer.

Potential impact	Residual impact after management	Residual impact significance	Proposed Environmental Outcomes
		occurrences within 50 km buffer. Previous records in the WA Herbarium (2025) database occurred back to 1995, 2005 and 2008, while ALA records were mostly documented between 1970 and 2018. Since then, only three occurrences have been reported, two of which within Pilbara, suggesting that further surveys are necessary. Additionally, a single occurrence of one individual does not constitute a viable population and is unlikely to impact the survival of the species at either a local or species level.	
		Not a Significant Residual Impact The direct clearing of 10 individuals of *Neptunia longipila* (P3) represents 5.29% of the total individuals within the DE. There are no previous records of this species within the 50 km buffer outside the DE. The nearest known occurrence from the 10 individuals proposed to be cleared is 650 m away, suggesting these are separate sub-populations with no or limited connectivity. Following the proposed clearing, 179 individuals will remain within the DE. As more than 94% of recorded individuals within the DE and within 50 km buffer will remain, it is unlikely that the proposed clearing will impact the survival of the species at either a local or species level. The impact to *Neptunia longipila* (P3) is therefore not considered significant.	
		Not a Significant Residual Impact The direct clearing of one occurrence (one individual) of *Paspalidium retiglume* (P2) represents 0.39% of the total individuals within the DE and 0.38% of the total individuals within	

Potential impact	Residual impact after management	Residual impact significance	Proposed Environmental Outcomes
		50 km buffer. The nearest occurrence is 2 km away within the DE, indicating no connectivity between them. Following the proposed clearing, 258 individuals will remain within the DE. As more than 99% of the recorded individuals withing the DE and 50 km buffer will remain, clearing of one individual of the species is not considered significant.	
		Not a Significant Residual Impact The direct clearing of 18 individuals of *Swainsona thompsoniana* (P3) represents 1.84% of individuals within the DE and 1.79 % of individuals within 50 km buffer. The occurrences are in close proximity to others (approximately 300 m) suggesting these individuals are likely are of the same sub-population. Following implementation of the Proposal, 959 individuals will remain within the DE. As more than 98% of recorded individuals within the DE and 99% of individuals within 50 km buffer will remain, it is unlikely that the proposed clearing will impact the survival of the species at either a local or species level.	
		Not a Significant Residual Impact The direct clearing of 35 individuals of *Ptilotus mollis* (P4) represents 2.98% of individuals within the DE and 0.45% of individuals within 50 km buffer. The closest occurrence is 9 km away, indicating no connectivity between these occurrences. Following the proposed clearing, 1,139 individuals will remain within the DE. As more than 97% of recorded individuals within the DE and 99% of individuals within 50 km buffer will	

Potential impact	Residual impact after management	Residual impact significance	Proposed Environmental Outcomes
		remain, it is unlikely that the proposed clearing will impact the survival of the species at either a local or species level. The impact to *Ptilotus mollis* (P4) is therefore not considered significant.	
Fragmentation of Sub-populations	The Proposal IDF will intersect occurrences of conservation significant flora species. However, it will not increase the distance between occurrences by more than 500 m, thereby dividing sub-populations. Additionally, it is not expected that the Proposal infrastructure will interfere with dispersal or pollination of these species.	**Not a Significant Residual Impact** The clearing associated with the linear elements of the Proposal infrastructure will be up to approximately 50 m wide, it is unlikely this would act as a barrier to dispersal and/or pollination of these species within the DE, particularly where pollination is via wind or birds.	
Edge effects on Conservation Significant Flora species	The Proposal may indirectly impact three conservation-significant species in the absence of appropriate mitigation measures: • *Paspalidium retiglume* (P2): 100 individuals, • *Euphorbia inappendiculata var. queenslandica (P3): 180 individuals, and* • *Ptilotus mollis (P4): 105 individuals*	**Residual Impact Unlikely** Even in the worst-case scenario, the potential loss of individuals would not represent an impact that could affect the survival of the species at either a local or species level, given that the edge effects on those populations will not fragment populations or remove individuals or habitat to an extent that the species is unlikely to survive.	
Introduction and/or spread of weed species	With the implementation of mitigation measures, the introduction and/or spread of weed species is not expected.	**Residual Impact Unlikely** After the implementation of mitigation measures, is not expected that the introduction and/or	**FV-5 Environmental Objective:** Implementation of the Environmental Management Plan monitor and minimise impacts on flora or vegetation from

Potential impact	Residual impact after management	Residual impact significance	Proposed Environmental Outcomes
		spread of weed species will result in a significant residual impact.	dust, weed spread, or changes to natural fire patterns when compared with existing environmental conditions. **Management of potential impacts from weeds can also be regulated under the Mining Act.**
Edge effects on Priority Ecological Community	As a result of the fragmentation of PEC patches and potential edge effects, 230.60 ha of VfAl may be indirectly impacted by the Proposal, including: • 205.08 ha of 'Four plant assemblages of the Wona Land system' PEC (P1, P3), and • 25.52 ha of potential 'Four plant assemblages of the Wona Land system' PEC (P1, P3).	**Not a Significant Residual Impact** The Proposal has the potential to indirectly impact up to 230.60 ha of VfAl. In a worst-case scenario — assuming the complete loss of this PEC and including the permanent clearing of 47.94 ha for the Proposal — this would represent 278.54 ha, or approximately 1.11% of the current extent of this PEC within a 50 km buffer of the DE. Therefore, a significant residual impact is not expected.	**As per FV-2 Environmental Outcome**
Indirect impacts on Groundwater Dependent Vegetation	As a result of the Proposal design, hydrological patterns within the area will not be altered.	**Not a Significant Residual Impact** At a regional scale, the residual impact to groundwater dependent vegetation is not expected to be significant.	**N/A**
Dust deposition	As a result of the implementation of standard dust management practices, indirect impacts to vegetation are not anticipated.	**Residual Impact Unlikely** As a result of the implementation of standard dust management practices, is dust deposition is unlikely to be a significant residual impact.	**FV-5 Environmental Objective** **Management of potential impacts from dust can also be regulated under the Mining Act.**
Increased risk of bushfires	As a result of the implementation of standard fire risk management practices, indirect impacts to vegetation are not expected.	**Not a Significant Residual Impact** At a regional scale, the impact on the vegetation is not expected to be significant.	**FV-5 Environmental Objective** **Management of potential impacts from bushfire can also be regulated under the Mining Act.**

The avoidance and minimisation measures detailed in this ERD, together with rehabilitation of temporary cleared areas and offsetting of significant residual impacts will result in the biological diversity and ecological integrity of the DE being maintained. The Proposal is consistent with the EPA's environmental objective for Flora and Vegetation (EPA, 2016a). Details of the proposed offsets are summarised in Chapter 12 (Offsets).

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8 TERRESTRIAL FAUNA

8.1 EPA Objective

The WA EPA objective for the terrestrial fauna environmental factor is '*To protect terrestrial fauna so that biological diversity and ecological integrity are maintained*' (EPA, 2016c). The WA EPA defines terrestrial fauna as '*animals living on land or using land (including aquatic systems) for all or part of their lives*' (EPA, 2016c).

8.2 Policy and Guidance

The following WA government agency policies and guidelines have been considered for the Proposal to meet the EPA's objective in relation to this factor:

- Statement of Environmental Principles, Factors and Objectives (EPA, 2023b),
- Environmental Factor Guideline – Terrestrial Fauna (EPA, 2016c),
- EPA Strategic Advice for Cumulative Environmental Impacts of Development in the Pilbara Region (EPA, 2014),
- Technical Guidance - Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment (EPA, 2020),
- Guidelines for Determining the Likely Presence and Habitat Usage of Night Parrot (*Pezoporus occidentalis*) in Western Australia (DBCA, 2024f),
- Guidelines for Surveys to Detect the Presence of Bilbies and Assess the Importance of Habitat in WA (DBCA, 2017), and
- Technical Guidance – Sampling of Short-Range Endemic Invertebrate Fauna (EPA, 2016d).

In addition, Commonwealth policies and guidelines have been considered for the Proposal including:

- EPBC Act Referral Guideline for the Endangered Northern Quoll *Dasyurus hallucatus*: EPBC Act Policy Statement (DoE, 2016),
- Survey Guidelines for Australia's Threatened Mammals: Guidelines for Detecting Mammals Listed as Threatened under the EPBC Act (DSEWPC, 2011a),
- Survey Guidelines for Australia's Threatened Birds: Guidelines for Detecting Birds listed as Threatened under the EPBC act (DEWHA, 2010a),
- Survey Guidelines for Australia's Threatened Reptiles: Guidelines for Detecting Reptiles listed as Threatened under the EPBC Act (DSEWPC, 2011b),
- Survey Guidelines for Australia's Threatened Bats: Guidelines for Detecting Bats listed as Threatened under the EPBC Act (DEWHA, 2010b),

- Onshore Wind Farm Guidance: Best practice approaches when seeking approval under Australia's national environmental law (DCCEEW, 2024a), and

- Relevant Commonwealth Recovery Plans, Conservation Advice and/or Threat Abatement Plans, including:

    - Conservation Advice for the Grey Falcon (*Falco hypoleucos*) (TSSC, 2020),

    - Conservation Advice for the Northern Quoll (*Dasyurus hallucatus*) (TSSC, 2005),

    - National Recovery Plan for the Northern Quoll *Dasyurus hallucatus* (Hill & Ward, 2012),

    - Conservation Advice for the Ghost Bat (*Macroderma gigas*) (TSSC, 2016a),

    - Conservation Advice for the Greater Bilby (*Macrotis lagotis*) (TSSC, 2016b),

    - Conservation Advice for the Pilbara Leaf-nosed Bat (*Rhinonicteris aurantia* (Pilbara Form)) (TSSC, 2016c).,

    - Conservation Advice for the Olive Python (Pilbara subspecies) (*Liasis olivaceus barroni*) (DEWHA, 2008a),

    - Conservation Advice for *Rostratula australis* (Australian Painted Snipe) (DSEWPaC, 2013),

    - Conservation Advice for the Common Greenshank (*Tringa nebularia*) (DCCEEW, 2024b), and

    - Conservation Advice for the Sharp-tailed Sandpiper (*Calidris acuminata*) (DCCEEW, 2024c).

Fauna surveys for the Proposal have been planned and executed in accordance with the EPA's technical guidance for the terrestrial fauna factor.

8.3 Studies and Surveys

8.3.1 Terrestrial Vertebrate Fauna

Detailed and targeted terrestrial vertebrate fauna surveys were completed for the Proposal within Bonney Downs North (ecologia, 2024a) and Bonney Downs South (Spectrum Ecology, 2024). Fortescue engaged ecologia Environment (ecologia) to consolidate the results of these assessments into a single report that covers the entire Bonney Downs Wind Generation Project ('the Survey Area') (ecologia, 2025b); IBSA number is IBSA-2025-0267, provided in Appendix F. The Survey Area comprises approximately 102,802.56 ha, which encompasses the entire extent of the DE. This Survey Area is shown within Appendix F (referred to as 'Study Area' in the report). The ecologia (2025b) report also incorporates the first year of Bird and Bat Site Utilisation Surveys by ecologia (2026) (described in Section 8.3.2) where relevant.

The timing of the two detailed fauna assessments undertaken within the Survey Area is summarised in Table 8-1.

All surveys used a variety of sampling techniques, including systematic, targeted and opportunistic methodologies. All surveys were in accordance with the *Technical Guidance – Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment* (EPA, 2020).

Table 8-1: Terrestrial Fauna Studies and Surveys

Report	Survey Timing	Survey Effort
Multi-phase detailed fauna survey		
Bonney Downs North: Terrestrial Fauna Assessment (ecologia, 2024a); incorporated into IBSA-2025-0267.	**Phase 1**: 22 May – 2 June 2023. **Phase 2**: 9 – 19 October 2023. **Phase 3**: 16 – 28 March 2024. **Targeted**: 24 July – 2 August 2024.	• Systematic trapping (pit, cage, Elliot and funnel): 9,260 trap nights (23 sites). • Camera traps: 2,274 recording nights (64 cameras). • Avifauna surveys: 123 hours. • Active searches: 94 hours. • Night Parrot Autonomous recording units (ARU) (acoustic): 60 recording nights (nine sites). • ARU (ultrasonic): 119 recording nights (41 sites). • Spotlighting: 76 hours. • Ghost Bat lure: Seven nights (Seven sites). • Targeted searches: Falcons (134 hours); Northern Quolls and Bats (64 hours).
Bonney Downs South: Terrestrial Fauna Assessment (Spectrum Ecology, 2024); incorporated into IBSA-2025-0267.	**Phase 1**: 13 – 25 October 2023. **Phase 2**: 4 – 14 April 2024. **Targeted camera installations**: 26 – 28 April 2024.	• Systematic trapping (pit, cage, Elliot and funnel): 4,630 trap nights (11 sites) • Targeted cage/Elliot traps: 790 trap nights (Elliot) and 224 trap nights (cage) • Camera traps: 1,610 recording nights (37 cameras) • Avifauna surveys: 57 hours • Active searches: 34 hours • Night Parrot ARU (acoustic): 38 recording nights (six sites) • ARU (ultrasonic): 40 recording nights (17 sites) • Spotlighting: 23.2 hours • Targeted searches: Grey Falcon (21 hours); Migratory Birds (8 hours); Olive Python (20 hours); Bilby (8 hours).

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8.3.2 Bird and Bat Site Utilisation Surveys

Fortescue commissioned ecologia (2026) to undertake 24 months of Bird and Bat Site Utilisation Surveys (BBSUS) within the Survey Area, the IBSA number for this survey is ISA-0001216. Timing of the BBSUS was designed to coincide with seasonal variation in the Pilbara region, with surveys undertaken in summer (December-February), autumn (March-May), winter (June-August) and spring (September-November) each year. All eight bird and bat site utilisation surveys have been completed approximately every three months between October 2023 and August 2025 (ecologia 2026):

- Spring southward migration: 12 – 19 October 2023,
- Summer wet season: 5 – 12 February 2024,
- Autumn northward migration: 21 – 28 March 2024,
- Winter dry season: 17 – 24 June 2024,
- Spring southward migration (Year 2): 10 – 17 September 2024,
- Summer wet season (Year 2): 10 – 12, 24 – 28 February 2025.
- Autumn northward migration (Year 2): 28 April – 5 May 2025, and
- Winter dry season (Year 2): 13 – 20 August 2025.

The BBSUS involved the following types of surveys:

- Fixed-point surveys: a total of 40 survey sites were established across the Survey Area to record avifauna and bat species present and understand how each species is utilising the site,
- Incidental records: incidental observations of species of concern were recorded while traversing the Survey Area,
- Autonomous recording units to record bat echolocation calls were deployed at each of the 40 fixed-point survey sites,
- Acoustic recording units to record Night Parrot calls were deployed at nine sites in prospective Night Parrot habitat,
- Targeted searches for the Grey Falcon and Peregrine Falcon were undertaken by walking transects within their preferred habitat types, and
- Ghost Bat acoustic lures were deployed at seven locations in the north of the Survey Area.

The site selection for the surveys was based on habitat types derived from land systems and aerial photography (site locations are shown in Figure 8-1). Habitat features known to provide shelter and foraging opportunities for significant fauna species (e.g. creek lines and ridgelines) were preferentially targeted.

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Legend

- Development Envelope
- GOV Towns
- Major Roads
- Fortescue Rail
- Roy Hill Rail
- Turbine Locations
- Indicative Disturbance Footprint
- Approved Disturbance (Nullagine Pilot Wind Farm)

Survey Locations

- Drainage Line/River/ Creek (major)
- Drainage Line/River/ Creek (minor)
- Hills/Ranges/Plateaux
- Plain (Cracking clays)
- Plain (stony/gibber)
- Rocky Escarpments (Ridges/Mesa/Cliffs/ Outcrops/ Breakaways)
- Woodland (open)
- Cleared

Data Source(s):
Aerial, Fortescue and ESRI
All other data, Fortescue, 2025

N

0 2 4 6 8 10
Kilometers

Figure 8-1
Bird and Bat Survey
Site Locations

Requested By: R. Dorji	Date: 1/28/2026
Drawn By: R. Kerr	Size: A4L
Revised By: rykerr	Revision: 1
Approved By:	Confidentiality: 0
Scale: 1:300,000	
Coordinate System: GDA 1994 MGA Zone 50	
Project Name: 4519OP002_MP_EN_0093_PartIV_2	
Document Name: 4519OP002_MP_EN_0093_017_r1_Bird_Bat	

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8.3.3 Short-Range Endemic Terrestrial Invertebrate Survey

Fortescue commissioned the Harry Butler Institute (HBI) Murdoch University to undertake a detailed Short-Range Endemic (SRE) terrestrial invertebrate survey for the Proposal (IBSA number IBSA-0001135) provided in Appendix G. The SRE Survey Area covered an area of approximately 102,943 ha, beyond the DE boundary ('SRE Survey Area'). The objective of the survey was to define the value of the SRE Survey Area with respect to terrestrial SREs and their habitats.

The SRE assessment included a desktop review and a two-phase field survey using standard SRE collecting techniques (foraging, leaf litter sifting and Winkler sack litter extractions). The two-phase field survey was undertaken between 12-21 February and between 4-15 April 2024 at 28 sites (Figure 8-2). All species and morphospecies determinations were derived from both morphological and molecular data: DNA barcoding with DNA sequence of the barcoding gene COI (Cytochrome C oxidase subunit I).

The assessment was conducted in accordance with the EPA's *Technical Guidance: Sampling of Short-Range Endemic invertebrate fauna* (EPA, 2016) and *Environmental Factor Guideline: Terrestrial Fauna* (EPA, 2016) and internal Fortescue standards.

The SRE assessment (HBI, 2024) is provided in Appendix G.

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Legend

- Development Envelope
- GOV Towns
- Major Roads
- Fortescue Rail
- Roy Hill Rail
- Indicative Disturbance Footprint
- Approved Disturbance (Nullagine Pilot Wind Farm)
- Sampling Sites

Fauna Habitats

- Cleared
- Drainage Line/River/ Creek (major)
- Drainage Line/River/ Creek (minor)
- Gorges/Gullies
- Granite Outcrops (flat dome)
- Hills/Ranges/Plateaux
- Plain (Cracking clays)
- Plain (stony/gibber)
- Rocky Escarpments (Ridges/Mesa/Cliffs/ Outcrops/ Breakaways)
- Woodland (closed)
- Woodland (open)

Data Source(s):
Aerial, Fortescue and ESRI
All other data, Fortescue, 2025

N

0 2 4 6 8 10
Kilometers

Figure 8-2
Short-range Endemics (SRE) Sampling Sites

Requested By: R. Dorji
Drawn By: R. Kerr
Revised By: rykerr
Approved By:
Scale: 1:300,000
Coordinate System: GDA 1994 MGA Zone 50
Project Name: 4519OP002_MP_EN_0093_PartIV_2
Document Name: 4519OP002_MP_EN_0093_018_r1_SRE

Date: 1/28/2026
Size: A4L
Revision: 1
Confidentiality: 0

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8.3.4 Limitations

All limitations associated with the Terrestrial Fauna Surveys, SRE Surveys, and Bird and Bat Site Utilisation Surveys are reported in Appendix F (ecologia, 2025b), Appendix G (HBI, 2024), and Appendix H (ecologia, 2026) respectively. No significant limitations were identified during the surveys.

8.4 Receiving Environment

8.4.1 Terrestrial Vertebrate Fauna

8.4.1.1 Fauna Habitats

Ecologia (2025b) mapped 10 broad fauna habitat types within the DE (excluding cleared areas). Fauna habitats were described as an area which is distinguishable from its surrounding area by its vegetation type, soil units and landforms present (ecologia, 2025b), which determine their ability to support specific fauna assemblages or significant fauna (EPA, 2020).

The majority of the DE was identified as plain (stony/gibber) habitat, representing 83.97% of the DE. This habitat was reported to be common and widespread in the Pilbara region. The granite outcrops (flat dome) habitat was reported to be restricted within the DE and within the broader region, this habitat comprises 0.01% of the DE. All other habitats were reported as common and widespread in the Pilbara. An additional 0.94% of the DE was reported as cleared, lacking suitable habitat for terrestrial vertebrate fauna.

The ecologia (2025b) report defines the condition of most of the habitat types within the DE as ranging from ‘Degraded’ to ‘Excellent’ (ecologia, 2025b). Where the ecologia (2025b) report did not note the habitat condition, a conservative approach has been adopted, and the condition has been described as ‘Excellent’.

Table 8-2 describes the mapped habitat types found in the DE, the significant fauna likely to be associated with each habitat and the extent of each habitat type in the DE. The fauna habitat mapping is displayed in Figure 8-3.

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Table 8-2: Fauna Habitats in the Development Envelope and BC Act Listed Fauna Associations (ecologia, 2025b)

Habitat / description	Significant fauna association with habitat*	Total within DE (ha)	Proportion within DE (%)
Woodland (open) Habitat characterised by open *Acacia aptaneura* (mulga) woodland over scattered mixed shrubs over scattered tussock grassland and herblands on red soil, sandy loam plains and stony substrates. **Habitat condition:** Excellent	**Supporting habitat:** • Grey Falcon – VU (hunting), • Ghost Bat – VU (foraging), • Pilbara Leaf-nosed Bat (PLNB) – VU (foraging), • Peregrine Falcon – OS (foraging), and • Oriental Plover – MI (dispersal and foraging).	574.28	0.64
Woodland (closed) Habitat characterised by dense *Acacia aptaneura* (mulga) woodland over scattered mixed shrubs over scattered tussock grassland and herblands on red soil, sandy loam plains and stony substrates. **Habitat condition**: Excellent	**Supporting habitat:** • Grey Falcon – VU (hunting), • Ghost Bat – VU (foraging), • PLNB – VU (foraging), • Peregrine Falcon – OS (foraging), and • Oriental Plover – MI (dispersal and foraging).	392.02	0.44
Granite outcrops (flat dome) Exposed boulder piles and domes with sparse vegetation limited to scattered soft grasses such as *Triodia* sp. hummocks. Substrate is sandy with no leaf or wood litter. **Habitat condition**: Excellent	**Supporting habitat:** • Grey Falcon – VU (hunting), • Northern Quoll – EN (dispersal and foraging) in southern portion of DE only, • Ghost Bat – VU (foraging), • PLNB – VU (foraging), • Peregrine Falcon – OS (foraging), • Long-tailed Dunnart – P4 (shelter, foraging, dispersal), and • Oriental Plover – MI (dispersal and foraging).	12.48	0.01
Plain (stony/gibber) Habitat characterised as stony or stony sand on flat plains. Vegetation is generally sparse with a very sparse mid story of mixed shrubs over variable density of hummock grassland	**Critical habitat:** • Night Parrot – CR (roosting). **Supporting habitat:** • Grey Falcon – VU (hunting),	75,547.94	83.97

Habitat / description	Significant fauna association with habitat*	Total within DE (ha)	Proportion within DE (%)
(*Triodia* spp.). The coarse stony clay soils provide habitat for species that burrow. **Habitat condition:** Good – Excellent	• Ghost Bat – VU (foraging), • PLNB – VU (foraging), • Peregrine Falcon – OS (foraging), • Brush-tailed Mulgara – P4 (burrowing), • Western Pebble-mound Mouse – P4 (mounds, foraging and dispersal), • Gane's Blind Snake – P1, and • Oriental Plover – MI (dispersal and foraging).		
Plain (cracking clays) This habitat is characterised by basalt upland gilgai plains associated with the Wona Land System which supports scattered shrubs over grasses and herbs. It provides quality foraging for granivores. **Habitat condition:** Good - Excellent	**Supporting habitat:** • Grey Falcon – VU (hunting), • Ghost Bat – VU (foraging), • PLNB – VU (foraging), • Peregrine Falcon – OS (foraging), • Short-tailed Mouse – P4 (shelter, foraging, dispersal), • Oriental Plover – MI (dispersal and foraging), and • Night Parrot – CR (foraging).	5,366.12	5.96
Hills/ranges/plateaux This habitat type consists of large ranges and hills associated with the Capricorn Land System with ridgelines and cliffs containing breakaways, boulders, crevices and caves. **Habitat condition:** Excellent	**Critical habitat:** • Northern Quoll – EN (denning, shelter and foraging) in northern portion of DE only with critical supporting habitat within 1 km of this critical habitat, • Pilbara Olive Python – VU (shelter, foraging and dispersal), • Ghost Bat – VU (potential roosting), and • PLNB – VU (potential roosting). **Supporting habitat:** • Grey Falcon – VU (hunting), • Peregrine Falcon – OS (foraging),	1,322.34	1.47

Habitat / description	Significant fauna association with habitat*	Total within DE (ha)	Proportion within DE (%)
	• Western Pebble-mound Mouse – P4 (mounds, foraging and dispersal), • Gane's Blind Snake – P1, • Long-tailed Dunnart – P4 (shelter, foraging, dispersal), and • Oriental Plover – MI (dispersal and foraging).		
Gorges/gullies Habitat characterised by low open woodland dominated by *Acacia cyperophylla var. omearana and Corymbia candida* over tall, sparse shrubland (*Acacia tumida, Grevillea wickhamii* and *Santalum lanceolatum*) over mixed low sparse tussock/hummock grassland (*Triodia* and *Eriachne*). **Habitat condition**: Excellent	**Critical habitat:** • Northern Quoll – EN (denning, shelter and foraging) in northern portion of DE only with critical supporting habitat within 1 km of this critical habitat, • Pilbara Olive Python – VU (shelter, foraging and dispersal), • Ghost Bat – VU (potential roosting), and • PLNB – VU (potential roosting). **Supporting habitat:** • Northern Quoll – EN (dispersal and foraging) in southern portion of DE only, • Grey Falcon – VU (hunting), • Peregrine Falcon – OS (foraging), • Long-tailed Dunnart – P4 (shelter, foraging, dispersal), • Gane's Blind Snake – P1, and • Oriental Plover – MI (dispersal and foraging).	41.51	0.05
Rocky escarpments (ridges/mesa/cliffs/outcrops/breakaways) Habitat characterised by mixed shrubland dominated by *Acacia sp., Senna sp., Hakea sp., Eremophila, Ptilotus obovatus*, *Paspalidium clementii* and *Solanum lasiophyllum* over hummock grassland of *Triodia* sp. **Habitat condition:** Excellent	**Critical habitat:** • Northern Quoll – EN (denning, shelter and foraging) in northern portion of DE only with critical supporting habitat within 1 km of this critical habitat, • Pilbara Olive Python – VU (shelter, foraging and dispersal), • PLNB – VU (potential roosting),	2,123.25	2.36

Habitat / description	Significant fauna association with habitat*	Total within DE (ha)	Proportion within DE (%)
	• Ghost Bat – VU (potential roosting), and • Peregrine Falcon – OS (nesting and foraging). **Supporting habitat:** • Northern Quoll – EN (dispersal and foraging) in southern portion of DE only, • Grey Falcon – VU (hunting), • PLNB – VU (foraging and dispersal), • Western Pebble-mound Mouse – P4 (mounds, foraging and dispersal), • Long-tailed Dunnart – P4 (shelter, foraging, dispersal), and • Oriental Plover – MI (dispersal and foraging).		
Drainage line/river/creek (major) Open Eucalypt woodland over *Acacia coriacea* subsp. *pendens* over low tussock and hummock grassland, featuring deeply incised drainage channels with a higher density of vegetation than surrounding areas. The scattered trees and shrubs in this habitat type provide habitat for birds and shelter for species using this habitat for dispersal. **Habitat condition:** Degraded - Good	**Critical habitat:** • Grey Falcon – VU (nesting), • Pilbara Olive Python – VU (shelter, foraging and dispersal), • PLNB – VU (foraging), • Ghost Bat – VU (foraging), and • Peregrine Falcon – OS (nesting and foraging). **Supporting habitat:** • Northern Quoll – EN (dispersal and foraging), • Australian Painted Snipe - EN (dispersal and foraging), • Common Greenshank – EN (dispersal and foraging), • Gane's Blind Snake – P1, • Common Sandpiper – MI (dispersal and foraging), • Red-necked Stint – MI (dispersal and foraging), • Oriental Plover – MI (dispersal and foraging), • Gull-billed Tern – MI (dispersal and foraging),	1,657.22	1.84

Habitat / description	Significant fauna association with habitat*	Total within DE (ha)	Proportion within DE (%)
	• Caspian Tern - MI (dispersal and foraging), • Glossy Ibis - MI (dispersal and foraging), • Wood Sandpiper - MI (dispersal and foraging), and • Marsh Sandpiper – MI (dispersal and foraging).		
Drainage line/river/creek (minor) This habitat features shallow incised drainage channels and a higher density of vegetation than surrounding areas. Substrates of gravelly, sand or rocks on clay/loam soils supports scattered trees and shrubs. **Habitat condition:** Poor	**Supporting habitat:** • Grey Falcon – VU (hunting), • Ghost Bat – VU (foraging), • PLNB – VU (foraging), • Peregrine Falcon – OS (foraging), • Short-tailed Mouse – P4 (shelter, foraging, dispersal), and • Oriental Plover – MI (dispersal and foraging).	2,092.13	2.33
Cleared Areas that have been previously cleared and contain little to no vegetation. These areas generally considered to provide no habitat value for fauna.	-	844.56	0.94
Total	**-**	**89,973.85**	**100**

*Note the following conservation abbreviations are used: Vulnerable (VU), Endangered (EN), Other Specially Protected (OS), Critically Endangered (CR), Migratory (MI) and Priority 4 (P4).

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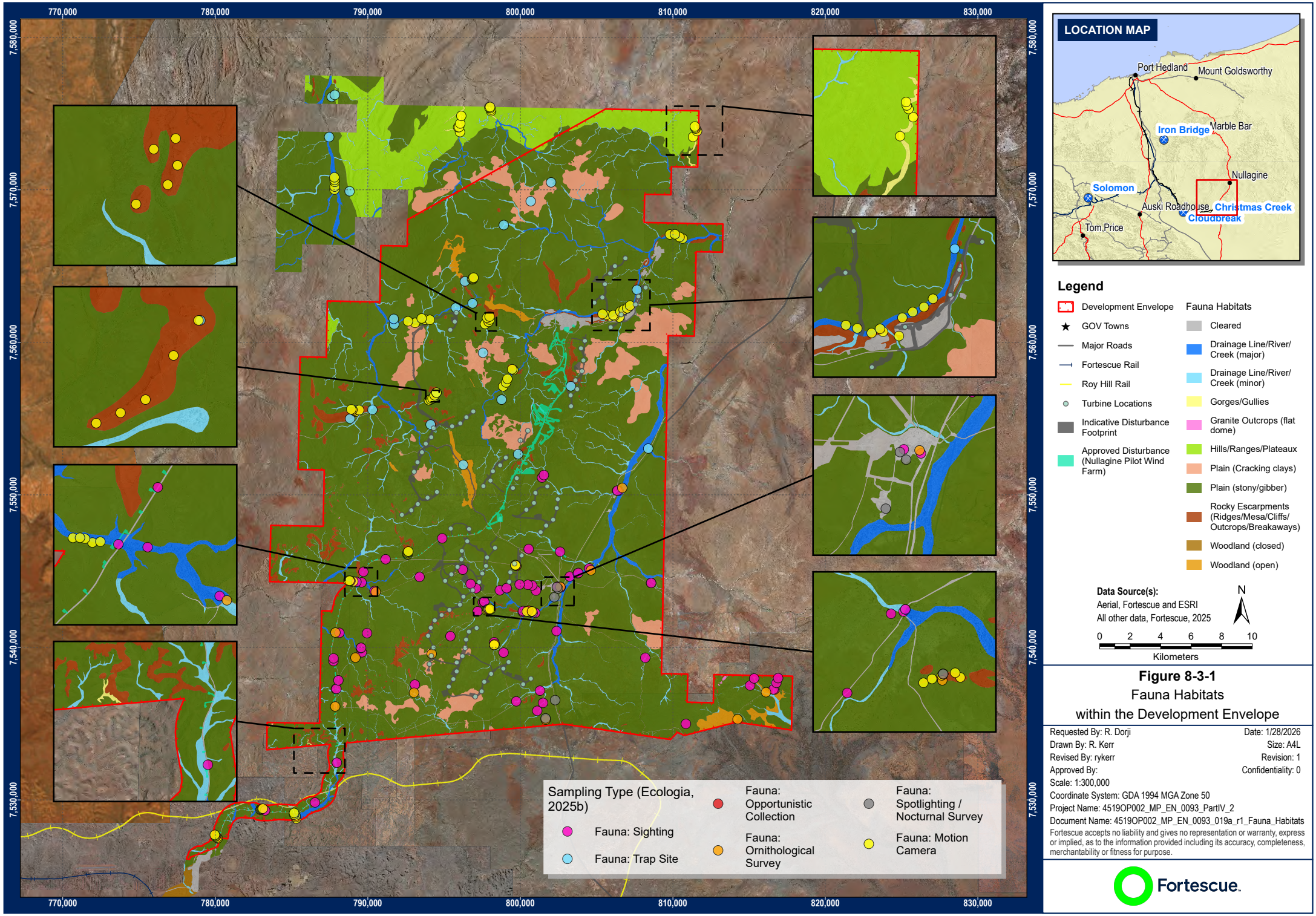

Legend

- Development Envelope
- GOV Towns
- Major Roads
- Fortescue Rail
- Roy Hill Rail
- Turbine Locations
- Indicative Disturbance Footprint
- Approved Disturbance (Nullagine Pilot Wind Farm)

Fauna Habitats

- Cleared
- Drainage Line/River/ Creek (major)
- Drainage Line/River/ Creek (minor)
- Gorges/Gullies
- Granite Outcrops (flat dome)
- Hills/Ranges/Plateaux
- Plain (Cracking clays)
- Plain (stony/gibber)
- Rocky Escarpments (Ridges/Mesa/Cliffs/ Outcrops/Breakaways)
- Woodland (closed)
- Woodland (open)

Data Source(s):
Aerial, Fortescue and ESRI
All other data, Fortescue, 2025

N

0 2 4 6 8 10
Kilometers

Figure 8-3-1
Fauna Habitats
within the Development Envelope

Requested By: R. Dorji	Date: 1/28/2026
Drawn By: R. Kerr	Size: A4L
Revised By: rykerr	Revision: 1
Approved By:	Confidentiality: 0
Scale: 1:300,000	
Coordinate System: GDA 1994 MGA Zone 50	
Project Name: 4519OP002_MP_EN_0093_PartIV_2	
Document Name: 4519OP002_MP_EN_0093_019a_r1_Fauna_Habitats	

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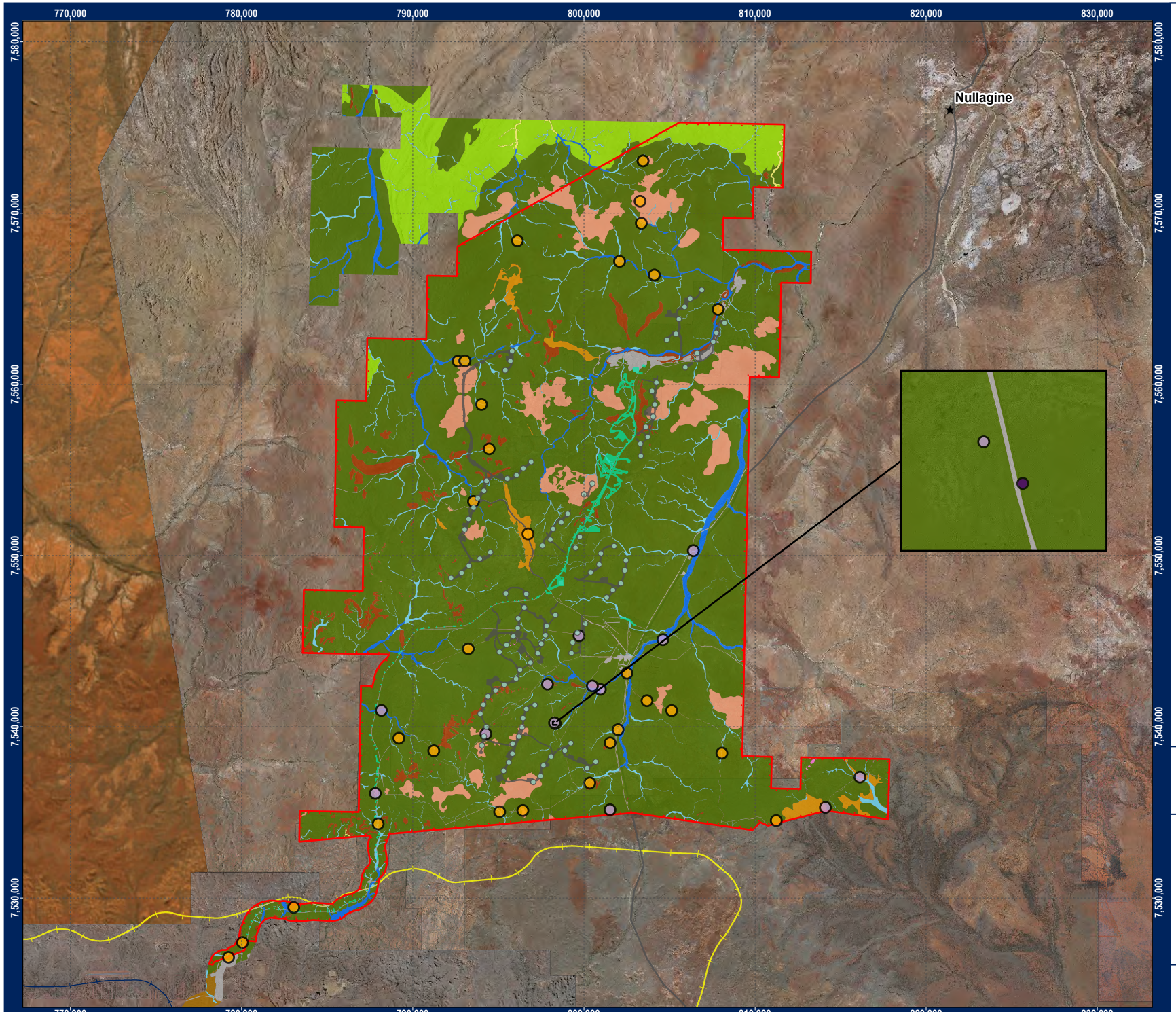

Legend

- Development Envelope
- GOV Towns
- Major Roads
- Fortescue Rail
- Roy Hill Rail
- Turbine Locations
- Indicative Disturbance Footprint
- Approved Disturbance (Nullagine Pilot Wind Farm)

Sampling Type (Ecologia, 2025b)

- Fauna: Habitat Assessment
- Fauna: Trap Site (Bucket)
- Fauna: Trap Site (Cage)

Fauna Habitats

- Cleared
- Drainage Line/River/ Creek (major)
- Drainage Line/River/ Creek (minor)
- Gorges/Gullies
- Granite Outcrops (flat dome)
- Hills/Ranges/Plateaux
- Plain (Cracking clays)
- Plain (stony/gibber)
- Rocky Escarpments (Ridges/Mesa/Cliffs/ Outcrops/Breakaways)
- Woodland (closed)
- Woodland (open)

Data Source(s):
Aerial, Fortescue and ESRI
All other data, Fortescue, 2025

N

0 2 4 6 8 10
Kilometers

Figure 8-3-2
Fauna Habitats
within the Development Envelope

Requested By: R. Dorji	Date: 1/28/2026
Drawn By: R. Kerr	Size: A4L
Revised By: rykerr	Revision: 1
Approved By:	Confidentiality: 0
Scale: 1:300,000	
Coordinate System: GDA 1994 MGA Zone 50	
Project Name: 4519OP002_MP_EN_0093_PartIV_2	
Document Name: 4519OP002_MP_EN_0093_019d_r1_Fauna_Habitats	

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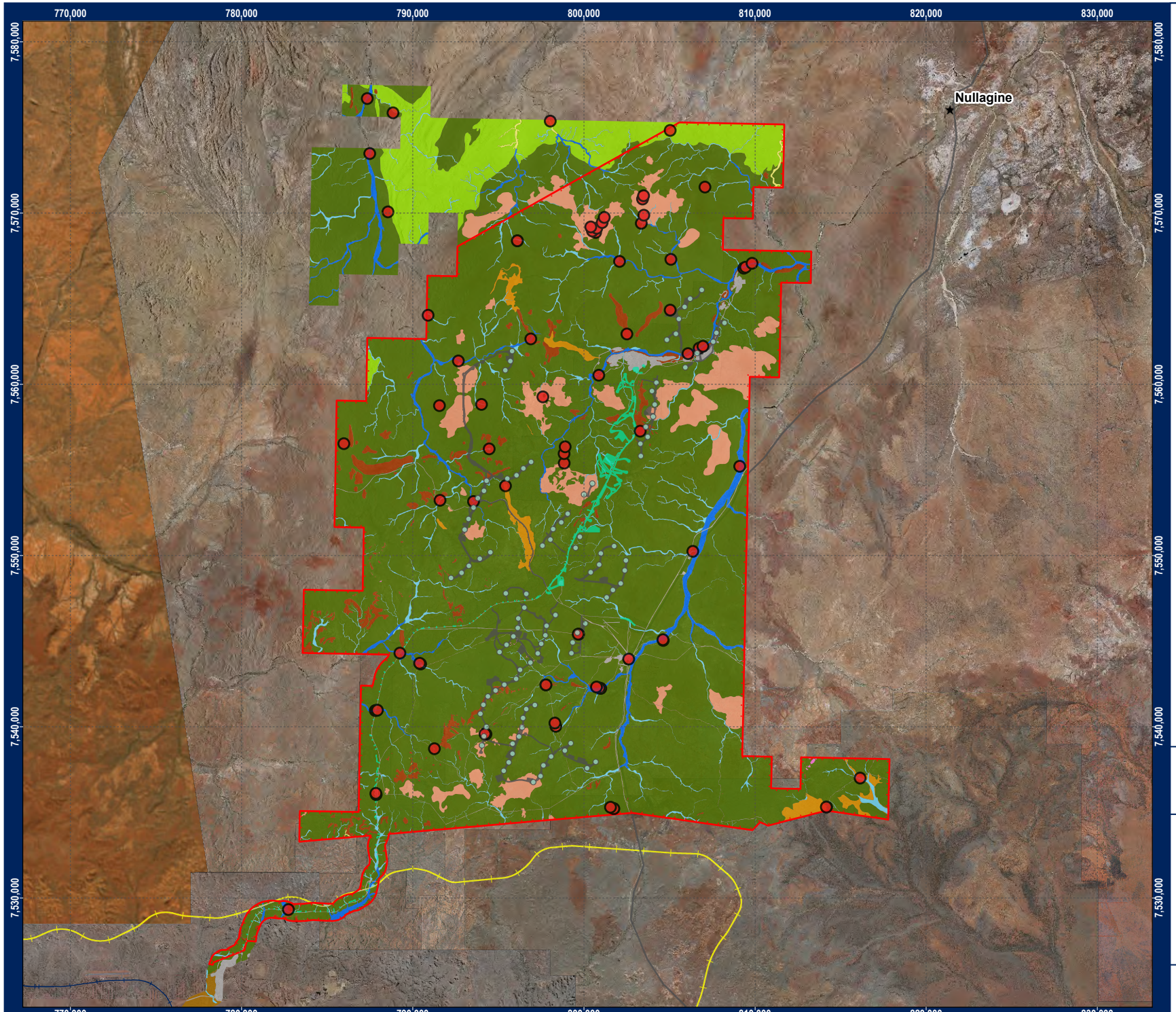

Legend

- Development Envelope
- GOV Towns
- Major Roads
- Fortescue Rail
- Roy Hill Rail
- Turbine Locations
- Indicative Disturbance Footprint
- Approved Disturbance (Nullagine Pilot Wind Farm)

Sampling Type (Ecologia, 2025b)

- Fauna: Sound Recorder

Fauna Habitats

- Cleared
- Drainage Line/River/ Creek (major)
- Drainage Line/River/ Creek (minor)
- Gorges/Gullies
- Granite Outcrops (flat dome)
- Hills/Ranges/Plateaux
- Plain (Cracking clays)
- Plain (stony/gibber)
- Rocky Escarpments (Ridges/Mesa/Cliffs/ Outcrops/Breakaways)
- Woodland (closed)
- Woodland (open)

Data Source(s):
Aerial, Fortescue and ESRI
All other data, Fortescue, 2025

N

0 2 4 6 8 10
Kilometers

Figure 8-3-3
Fauna Habitats
within the Development Envelope

Requested By: R. Dorji	Date: 1/28/2026
Drawn By: R. Kerr	Size: A4L
Revised By: rykerr	Revision: 1
Approved By:	Confidentiality: 0
Scale: 1:300,000	
Coordinate System: GDA 1994 MGA Zone 50	
Project Name: 4519OP002_MP_EN_0093_PartIV_2	
Document Name: 4519OP002_MP_EN_0093_019e_r1_Fauna_Habitats	

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8.4.1.2 Fauna Species

The consolidated terrestrial vertebrate fauna survey (ecologia, 2025b) determined the likelihood of occurrence of each species in the DE and surrounding area. In addition to the species recorded during the field surveys and the previously recorded species (desktop study), the likelihood of occurrence assessment also considered the known distribution of species' habitat, habitat preferences for each species and the proximity of known records. Table 8-3 shows the likelihood of occurrence criteria (ecologia, 2025b).

Table 8-3: Likelihood of Occurrence Criteria*

Criteria	Description
Recorded	The species has been recorded within the Survey Area previously or during the current survey.
High (likely to occur)	The species is likely to occur within the Survey Area as suitable habitat is known to be present and there are existing records very close to the Survey Area (within 5-15 km, depending on species mobility).
Moderate (possibly occurs)	The species may occur within the Survey Area as there are existing records in the vicinity of the Survey Area, and suitable habitat is likely to be present; OR The species may occur within the Survey Area as there is insufficient information available to exclude the possibility occurrence.
Low (unlikely to occur)	The species is unlikely to occur within the Survey Area as suitable habitat is not present or is not likely to be present; OR Suitable habitat is present within the Survey Area, but the taxon has not been recorded despite reasonable survey effort.
Does not occur	The species is recognised as being locally extinct or extinct in the wild and does not occur within the Survey Area; OR Records identified through database searches are associated with a listed subspecies which does not occur within the region.

*The species' biology, detectability and frequency of records are considered in the likelihood assessment (e.g. an elusive species that is very rarely recorded may be rated more likely to occur than a species that is easily detectable).

Eleven vertebrate species of significance were recorded (ecologia, 2025b; 2026) within the DE. Based on previous records from the Survey Area (as defined by ecologia, 2025b; 2026) and the likelihood of occurrence assessment (ecologia, 2025b), the following conservation significant species were recorded, or allocated a 'High' or 'Moderate' likelihood of occurrence within the DE.

Recorded within the DE:

- Northern Quoll (*Dasyurus hallucatus*) – Endangered under BC Act and EPBC Act,
- Ghost Bat (*Macroderma gigas*) – Vulnerable under BC Act and EPBC Act,
- Pilbara Leaf-nosed Bat (*Rhinonicteris aurantia* (Pilbara form)) – Vulnerable under BC Act and EPBC Act,
- Grey Falcon (*Falco hypoleucos*) – Vulnerable under BC Act and EPBC Act,

- Pilbara Olive Python (*Liasis olivaceus barroni*) – Vulnerable under BC Act and EPBC Act,
- Gane's Blind Snake (*Anilios ganei*) – Priority 1 listed by the Department of Biodiversity, Conservation and Attractions (DBCA),
- Brush-tailed Mulgara (*Dasycercus blythi*) – Priority 4 listed by DBCA,
- Western Pebble-mound Mouse (*Pseudomys chapmani*) – Priority 4 listed by DBCA, and
- Short-tailed Mouse (*Leggadina lakedownensis*) – Priority 4 listed by DBCA.
- Fork-tailed Swift (*Apus pacificus*) - Migratory under BC Act and EPBC Act,
- Oriental Plover (*Charadrius veredus*) – Migratory under BC Act and EPBC Act,

High Likelihood of Occurrence within the DE:

- Peregrine Falcon (*Falco peregrinus*) – Other Specially Protected under BC Act, and
- Long-tailed Dunnart (*Antechinomys longicaudata*) – Priority 4 listed by DBCA.

Moderate likelihood of occurrence within the DE:

- Night Parrot (*Pezoporus occidentalis*) – Critically Endangered under BC Act and Endangered under EPBC Act,
- Australian Painted Snipe (*Rostratula australis*) – Endangered under BC Act and EPBC Act,
- Common Greenshank (*Tringa nebularia*) – Endangered under BC Act and Endangered and Migratory under EPBC Act,
- Sharp-tailed Sandpiper (*Calidris acuminata*) – Migratory under BC Act and Vulnerable and Migratory EPBC Act,
- Common Sandpiper (*Actitis hypoleucos*) – Migratory under BC Act and EPBC Act,
- Red-necked Stint (*Calidris ruficollis*) – Migratory under BC Act and EPBC Act,
- Gull-billed Tern (*Gelochelidon nilotica*) – Migratory under BC Act and EPBC Act,
- Caspian Tern (*Hydroprogne caspia*) – Migratory under BC Act and EPBC Act,
- Glossy Ibis (*Plegadis falcinellus*) – Migratory under BC Act and EPBC Act,
- Wood Sandpiper (*Tringa glareola*) – Migratory under BC Act and EPBC Act, and
- Marsh Sandpiper (*Tringa stagnatilis*) – Migratory under BC Act and EPBC Act.

According to the DBCA database, there are two Bilby (*Macrotis lagotis*) records within the DE, however these are from 1982 and 1984. These records were not included in the Dziminski, Carpenter and Morris (2020) analysis of historical Bilby records, deeming them to be uncertain due to low location accuracy. No evidence of this species was recorded during the ecologia (2025b) survey. Most of the DE encompasses rocky habitats and plain (stony/gibber) habitat which lack suitable substrates and habitat for the Bilby (ecologia, 2025b). Given the uncertainty of the historical records, general lack of suitable habitat and absence of evidence to suggest that the species is occupying the DE, the Bilby is considered to have a low likelihood of occurrence.

Bird and Bat Site Utilisation Surveys

A total of 128 bird and bat taxa have been recorded in the Survey Area, including 123 records during the ecologia (2026) BBSUS (Appendix H), and five additional bird and bat taxa records from the ecologia (2025b) detailed and targeted terrestrial vertebrate fauna surveys. One species listed as Threatened under the BC Act was recorded during the BBSUS (ecologia, 2026); the Grey Falcon, which is described in Section 8.4.2.1.

Analysis of echolocation calls in the Survey Area identified the presence of at least 10 species of bat within the local area (ecologia, 2026). This included two species listed as Threatened under the BC Act; the Ghost Bat and the PLNB, which are described in Section 8.4.2.1.

The results of the BBSUS undertaken for the Proposal are outlined in Table 8-4.

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Table 8-4: Bird and Bat Utilisation Survey Results

Survey Date	Total Survey Effort – 4 Surveys	Results
12 – 19 October 2023 (spring)	Overall • Thirty-minute fixed-point avifauna surveys were conducted at 40 BBSUS sites. • A total of 960 surveys have been completed to date (120 per survey phase). • Each site was surveyed three times (morning, mid-day and evening) over an eight-day period by three zoologists across four seasons. Bird • 60 nights of targeted Night Parrot ARUs in potential Night Parrot habitat. • Incidental observations of species of concern and raptors were recorded while traversing the site. • 306 hours of targeted searches (including Grey Falcon, Peregrine Falcon) and spotlighting for nocturnal species. Bat • ARUs at all BBSUS sites for minimum of two nights, resulting in 610 recording nights. • 34 additional bat detectors were placed on potential flight pathways. • Ghost Bat lures at seven locations during the March 2024 survey.	• Total number of species observed: 67 Conservation Significant Birds: • 2 Grey Falcons were observed. Conservation Significant Bats: • Pilbara Leaf-nosed Bats recorded at four sites.
5 – 12 February 2024 (summer)		• Total number of species observed: 78 Bird (conservation significant) • 1 Grey Falcon observed. Bat (conservation significant) • Pilbara Leaf-nosed Bat recorded at three sites.
21 – 28 March 2024 (autumn)		• Total number of species observed: 76 • No Significant Bird Species recorded. Conservation Significant Bats: • 1 Ghost Bat recorded.
17 – 24 June 2024 (winter)		• Total number of species observed: 75 • No Significant Species recorded.
10 – 17 September 2024		• Total number of species recorded: 76 Conservation Significant Birds: • 1 Oriental Plover observed. Conservation Significant Bats: • PLNB recorded at 1 site.
10 -13, 24 - 28 February 2025		• Total number of species recorded: 83 Conservation Significant Birds: • 2 Grey Falcons observed. • 13 Pacific swift (fork-tailed swift) recorded.

Survey Date	Total Survey Effort – 4 Surveys	Results
		Conservation Significant Bats: • No
28 April – 5 May 2025		• Total number of species recorded: 76 Conservation Significant Birds: • No significant bird species recorded. Conservation Significant Bats: • PLNB recorded at 6 sites.
13 – 20 August 2025		• Total number of species recorded: 82 Conservation Significant Birds: • No significant bird species recorded. Conservation Significant Bats: • PLNB recorded at 2 sites

8.4.2 Conservation Significant Fauna

8.4.2.1 Threatened Fauna

Threatened fauna are legislatively protected under the BC Act and/or the EPBC Act and are allocated a conservation status ranging from Critically Endangered to Vulnerable. Threatened fauna recorded during the ecologia (2025b) survey, along with those identified post survey as having ‘High’ or ‘Moderate’ likelihood of occurrence within the DE are discussed in the context of potential habitat within the DE. Threatened fauna that are also considered Migratory species are discussed in section 8.4.5. Records of conservation significant fauna species within, or in close proximity to the DE are shown in Figure 8-4.

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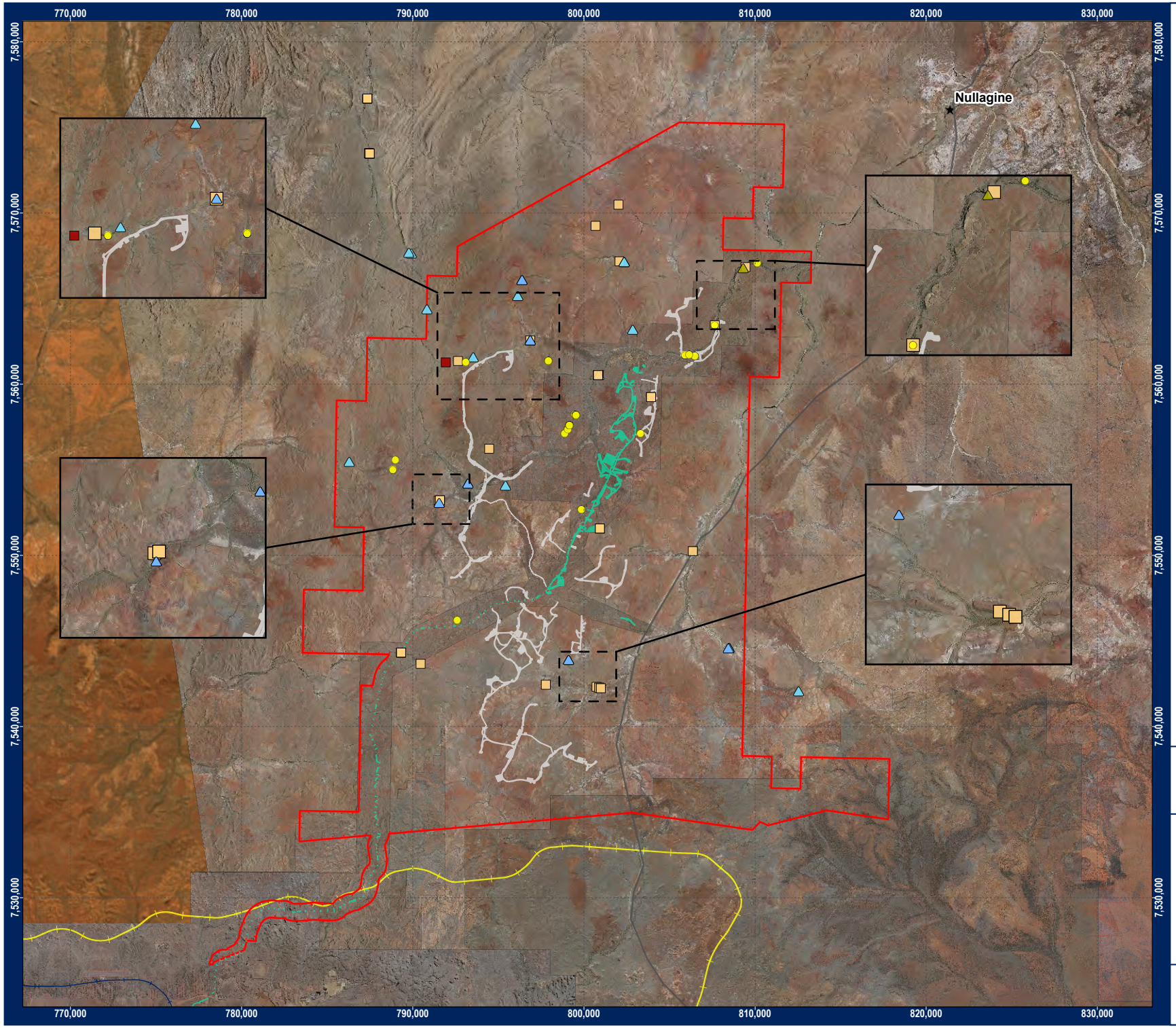

Legend

- Development Envelope
- GOV Towns
- Major Roads
- Fortescue Rail
- Roy Hill Rail
- Indicative Disturbance Footprint
- Approved Disturbance (Nullagine Pilot Wind Farm)

Threatened Species

Endangered

- Northern Quoll

Vulnerable

- Ghost Bat
- Grey Falcon
- Pilbara Leaf-Nosed Bat
- Pilbara Olive Python

Data Source(s):
Aerial, Fortescue and ESRI
All other data, Fortescue, 2025

N

0 2 4 6 8 10
Kilometers

Figure 8-4-1
Conservation Significant Fauna within the Development Envelope

Requested By: R. Dorji	Date: 1/29/2026
Drawn By: R. Kerr	Size: A4L
Revised By: rykerr	Revision: 1
Approved By:	Confidentiality: 0
Scale: 1:300,000	
Coordinate System: GDA 1994 MGA Zone 50	
Project Name: 4519OP002_MP_EN_0093_PartIV_2	
Document Name: 4519OP002_MP_EN_0093_020a_r1_Cons_Sig_Fauna	

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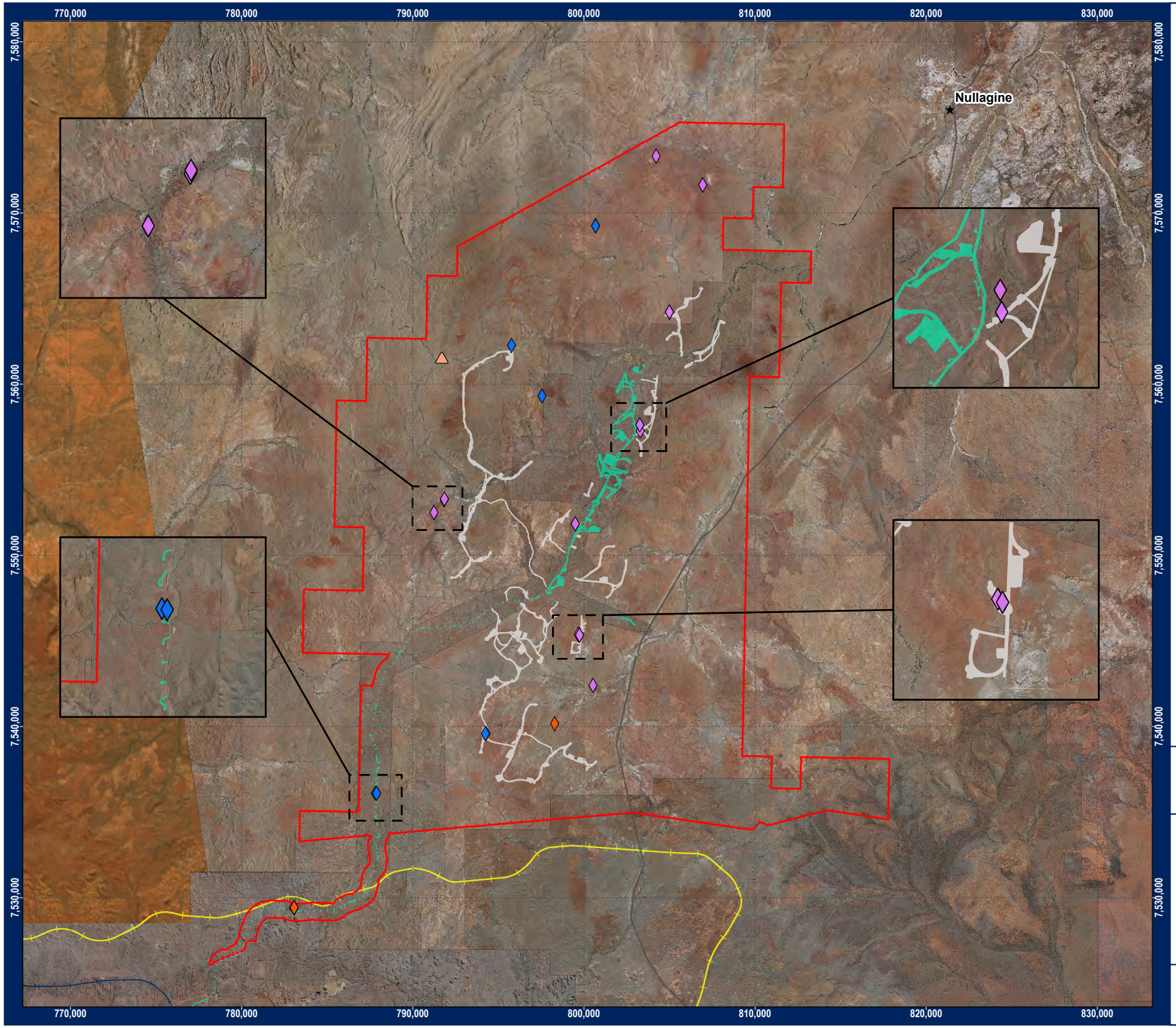

Legend

- Development Envelope
- GOV Towns
- Major Roads
- Fortescue Rail
- Roy Hill Rail
- Indicative Disturbance Footprint
- Approved Disturbance (Nullagine Pilot Wind Farm)

Priority 1 (DBCA)

- Gane's blind snake

Priority 2 (DBCA)

- Brush-tailed mulgara, ampurta
- Short-tailed mouse
- Western pebble-mound mouse

Data Source(s):
Aerial, Fortescue and ESRI
All other data, Fortescue, 2025

N

0 2 4 6 8 10
Kilometers

Figure 8-4-2
Conservation Significant Fauna within the Development Envelope

Requested By: R. Dorji	Date: 1/29/2026
Drawn By: R. Kerr	Size: A4L
Revised By: rykerr	Revision: 1
Approved By:	Confidentiality: 0
Scale: 1:300,000	
Coordinate System: GDA 1994 MGA Zone 50	
Project Name: 4519OP002_MP_EN_0093_PartIV_2	
Document Name: 4519OP002_MP_EN_0093_020b_r1_Cons_Sig_Fauna	

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Legend

- Development Envelope
- GOV Towns
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- Fortescue Rail
- Roy Hill Rail
- Indicative Disturbance Footprint
- Approved Disturbance (Nullagine Pilot Wind Farm)

Migratory Birds

- Oriental Plover
- Fork-tailed Swift

Data Source(s):
Aerial, Fortescue and ESRI
All other data, Fortescue, 2025

N

0 2 4 6 8 10
Kilometers

Figure 8-4-3
Conservation Significant Fauna within the Development Envelope

Requested By: R. Dorji
Drawn By: R. Kerr
Revised By: rykerr
Approved By:
Scale: 1:300,000
Coordinate System: GDA 1994 MGA Zone 50
Project Name: 4519OP002_MP_EN_0093_PartIV_2
Document Name: 4519OP002_MP_EN_0093_020c_r1_Cons_Sig_Fauna

Date: 1/29/2026
Size: A4L
Revision: 1
Confidentiality: 0

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Northern Quoll (*Dasyurus hallucatus*) - Recorded

Species Background Information

The Northern Quoll is a small marsupial characterised by white spots on a reddish-brown coat, a long tail and a pointed snout. This species is the smallest of the Australian quolls and is opportunistically omnivorous and predominantly nocturnal. The Northern Quoll is listed as Endangered under the BC Act and the EPBC Act (TSSC, 2005).

Abundance and Distribution

The species was widely distributed across northern Australia at the time of European settlement; however, its range has declined substantially over the last century, particularly in lowland areas and/or the semi-arid inland fringes of its range (Hill & Ward, 2010). The species has a discontinuous distribution across northern Australia and is now restricted to six separate land units including the Pilbara (Braithwaite & Griffiths, 1994). In the Pilbara region, the species is mostly found within ironstone formations, some river systems and the Burrup Peninsula and adjacent offshore islands. Within the Pilbara, Northern Quolls are most prevalent within complex rocky areas in the north, west and central Pilbara (DBCA, 2023b). Male Northern Quolls are estimated to have a territory range of over 150 ha, while their female counterparts maintain a range of 35 ha (TSSC, 2005).

There is no historical data on abundance for this species. The Pilbara Northern Quoll population is identified in the 'National Recovery Plan for the Northern Quoll (*Dasyurus hallucatus*)' as an important population due to the lack of Cane Toads in the region (Hill & Ward, 2010). Therefore, individuals recorded within the DE are considered part of an important population.

Habitat Preferences

Northern Quolls do not have highly specific habitat requirements and therefore occur in a wide variety of habitats across their range (Hill & Ward, 2010). The species is most abundant in rocky habitats due to the availability of shelters/dens, however, their preferred habitat includes rugged and rocky landscapes, including rocky hills, rocky creek lines, gorges, patches of granite outcrops and boulder-strewn slopes. The species can also be found in tropical and monsoonal rainforest, lowland savannah, vine thickets, on beaches and amongst human settlements (Moore *et al*., 2021). In the Pilbara, rocky dens act as thermal refuges and a refuge from predators (Hernandez-Santin *et al*., 2016).

The species uses various micro-habitats for foraging and denning such as gorges, breakaways and hills. It also occurs near creeks and drainage lines, where adjacent plains and vegetated areas provide habitat for foraging and the dispersal of young. The dens are often made in rock crevices, tree holes, or occasionally termite mounds (van Dyck & Strahan, 2008).

Complex, rocky landforms located close to permanent water sources are considered critical habitat for the Northern Quoll due to the protection this habitat provides from predators (DBCA, 2023b).

Threats

The main threat to Northern Quolls is cane toads, due to lethal toxic ingestion (Hill & Ward, 2010). However, Northern Quolls have also declined from larger areas in WA where cane toads have not yet reached, such as the Pilbara region. Within the Pilbara, key threats to the species include inappropriate fire regimes; predation by, and competition with, feral cats and foxes; and habitat loss, fragmentation and degradation (e.g. weed infestation), especially from mining and infrastructure development (DBCA, 2023b).

Known Populations in the Vicinity of the DE and Broader Region

According to the DBCA database, there are 142 records within 40 km of the DE occurring between 1979 and 2024. Of these records, 73 are located within the DE.

During the field surveys, the Northern Quoll was recorded on 229 occasions within the DE. The Northern Quoll was recorded in the drainage line/river/creek (major) and rocky escarpment (ridges/mesa/cliffs/outcrops/breakaways) habitats (ecologia, 2025b).

Species Habitat Extent, Quality and Importance

Rocky areas and offshore islands (predominately of the Northern Territory (NT) and WA) are defined in the Northern Quoll's Recovery Plan as habitat critical to the survival of the species (Hill & Ward, 2010).

High density Northern Quoll populations are considered important for the long-term survival of the species when they occur in refuge-rich habitats (DoE, 2016). Based on the number of individuals identified (at least 17 determined from the survey through spot pattern analysis and trapping, and frequency of detections during field surveys (219 independent motion camera visits), the northern half of the DE appears to support a high density, reproductive population of Northern Quolls (ecologia, 2025b).

The rocky escarpments (ridges/mesa/cliffs/outcrops/breakaways), gorges/gullies and hills/ranges/plateaux habitat within the northern half of the DE is considered habitat critical for the survival of the Northern Quoll (ecologia, 2025b), as shown in Figure 8-5. These habitats provide denning, shelter, foraging and/or dispersal habitat for the species.

Based on the EPBC Act referral guideline for the Northern Quoll (DoE, 2016), areas within 1 km of habitat critical for the survival of the Northern Quoll is considered 'critical supporting' habitat for foraging and dispersal. Therefore, a 1 km buffer on the following habitats within the northern portion of the DE are considered critical supporting habitat:

- Rocky escarpments (ridges/mesa/cliffs/outcrops/breakaways),
- Gorges/gullies, and
- Hills/ranges/plateaux.

Additionally, rocky escarpments (ridges/mesa/cliffs/outcrops/breakaways), gorges/gullies, granite outcrops (flat dome) and drainage line/river/creek (major) habitat types in the southern portion of the DE may be used by the species for dispersal and foraging activities and are considered supporting habitat. The drainage line/river/creek (major) habitat within the northern portion (outside 1 km buffer around critical habitat) also provides supporting habitat for

dispersal and foraging activities. The extent of potential Northern Quoll habitat types present in the DE is shown in Table 8-5:

Table 8-5: Northern Quoll Habitat Types in the Development Envelope

Portion of DE	Habitat type	Habitat importance	Extent in DE (ha)
Northern portion	Rocky escarpments (ridges/mesa/cliffs/outcrops/breakaways)	Critical habitat (denning, shelter, dispersal and foraging)	1,302.62
	Gorges/gullies		36.70
	Hills/ranges/plateaux		1,322.34
	1 km buffer around critical habitat[9]	Critical supporting habitat (foraging, dispersal)	18,462.97
Southern portion	Rocky escarpments (ridges/mesa/cliffs/outcrops/breakaways)	Supporting habitat (foraging, dispersal)	820.18
	Gorges/gullies		4.81
	Granite outcrops (flat dome)		12.48
Northern and Southern Portions	Drainage line/river/creek (major) outside 1 km buffer around critical habitat	Supporting habitat (foraging, dispersal)	1,242.61

The habitat condition of these habitats is reported in Section 8.4.1.1 (in Table 8-2) and ranged from ‘Degraded’ to ‘Excellent’ (ecologia, 2025b).

[9] Small sections of this buffer fall within the southern portion as presented in Figure 8-5.

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Legend

- Development Envelope
- GOV Towns
- Major Roads
- Fortescue Rail
- Roy Hill Rail
- Indicative Disturbance Footprint
- Approved Disturbance (Nullagine Pilot Wind Farm)
- Northern Quoll
- Critical Supporting Habitat - North
- Critical Supporting Habitat - South

Critical Fauna Habitats

- Gorges/Gullies
- Hills/Ranges/Plateaux
- Rocky Escarpments (Ridges/Mesa/Cliffs/ Outcrops/Breakaways)

Microhabitat Locations

- Date Palm
- Artificial pool/waterhole
- Non-permanent pool/ waterhole
- Permanent pool/ waterhole
- Stick nest

Data Source(s):
Aerial, Fortescue and ESRI
All other data, Fortescue, 2025

N

0 2 4 6 8 10
Kilometers

Figure 8-5
Northern Quoll
Critical Habitat and Records

Requested By: R. Dorji
Date: 1/29/2026
Drawn By: R. Kerr
Size: A4L
Revised By: rykerr
Revision: 0
Approved By:
Confidentiality: 0
Scale: 1:300,000
Coordinate System: GDA 1994 MGA Zone 50
Project Name: 4519OP002_MP_EN_0093_PartIV_2
Document Name: 4519OP002_MP_EN_0093_021_r0_NQ_Habitats

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Pilbara Leaf-nosed Bat (*Rhinonicteris aurantia*) - Recorded

Species Background Information

The PLNB is an insectivorous, medium sized subpopulation of the orange leaf-nosed bat. The PLNB has a characteristic leaf-like nose, small ears and short fur that ranges in colour from bright orange to yellow, white or brown (DBCA, 2023b). The PLNB is listed as Vulnerable under the EPBC Act and BC Act.

Abundance and Distribution

The PLNB is endemic to WA, occurring throughout the Pilbara and adjoining regions of the Ashburton and Little Sandy Desert IBRA bioregions (Bat Call, 2021). It is estimated that the Pilbara and Kimberley populations have been separated by the Great Sandy Desert for over 30,000 years (Armstrong, 2006; 2008). While the species has been detected across most of the Pilbara, the PLNB's area of occupancy (excluding foraging habitat) is estimated to be less than 1,000 ha (DBCA, 2023b). Diurnal roosts suitable for the species are patchily distributed, often occurring in areas of economic interest (Cramer *et al.,* 2016). The PLNB typically forages up to 20 km from their diurnal roost, sometimes occurring up to 30 km away during lower temperature months. This distance can reduce significantly during the dry season in January and February (Bat Call, 2021) when PLNB colonies are believed to contract to the deepest mines and caves to maintain their preferred habitat temperature and humidity (ecologia, 2025b).

The PLNB population is estimated to be between approximately 10,000 to 15,000 individuals with records of occurrence throughout the Pilbara (excepting the northwestern area from Karratha to the Fortescue River (Bat Call, 2021). The PLNB population in the Pilbara and upper Gascoyne is considered an important population due to genetic and behavioural divergences from populations further north (Bat Call, 2021).

Habitat Preferences

The PLNB has very limiting habitat requirements, including caves and disused mines with hot and humid roost sites within the 28°C to 32°C temperature range and between 96% to 100% humidity (ecologia, 2025b). The species has poor thermoregulation, and its evaporative water loss is more than double that of other bats (Bat Call, 2021). Due to these specific requirements, PLNB habitat is typically found in caves with ephemeral pools or waterfalls at roost entrances or seeps and groundwater pools deep inside caves (DBCA, 2023b).

The PLNB has been observed foraging in a variety of habitats, including spinifex hummock grasslands, covering low rolling hills and shallow gullies, black soil grasslands, open savannah woodland and tall open forest and monsoon rainforest (ecologia, 2025b). The species is commonly encountered near small pools of water in rocky gullies and gorges (DEWHA, 2021).

According to the PLNB Conservation Advice (TSSC, 2016c), habitat considered critical for foraging includes gorges with pools, gullies, rocky outcrops, major watercourses and open grassland and woodland.

Threats

Threats to PLNB populations include feral cat predation, climate change, disturbance and destruction of roosts (including secondary impacts of mining such as vibration, dewatering,

light, noise and blasting), degradation and fragmentation of foraging habitat, hydrological change, reduction in water quality and interactions with wind turbines (DBCA, 2023b).

Known Populations in the Vicinity of the DE and Broader Region

According to the DBCA database, there are 214 records within 40 km of the DE, recorded between 1998 to 2021. None of these records are from within the DE. The closest record is from 1998 and is approximately 20 km north-east of the DE.

The surveys completed for the Proposal recorded echolocation calls at 25 sites within the Survey Area, of which 23 occurred within the DE (ecologia, 2025b and ecologia, 2026). The majority of these were recorded within the drainage line/river/creek (major) habitat and adjacent to water sources (mostly dams) during the wet season (ecologia, 2025b). There were no low-time calls (calls within 20 minutes of sunset or sunrise) indicative of a nearby potential roost site during current or previous surveys (ecologia, 2025b).

Species Habitat Extent, Quality and Importance

Critical habitat of the PLNB is defined in its Conservation Advice (TSSC, 2016c) as deep underground caves or complex mines that are used or suspected of being used for diurnal roosting with large colony sizes which are critical for the species' survival. Potential foraging habitat may also be classified as critical habitat depending on the type and quality of the habitat (TSSC, 2016c).

No suitable roost caves were identified during targeted surveys (ecologia, 2025b; ecologia, 2026). Roosting opportunities may occur in the rocky escarpment (ridges/mesa/cliffs/outcrops/breakaways), hills/ranges/plateaux and gorges/gullies habitat types. Therefore, these habitats are considered critical habitat, as shown in Figure 8-6. Foraging habitat with water sources is also important for the species (TSSC, 2016c), therefore the drainage line/river/creek (major) habitat type is also considered critical habitat for the PLNB.

All other habitat types are considered potential foraging habitat and are considered supporting habitat for the PLNB (ecologia, 2025b). The extent of potential PLNB habitat present in the DE is shown in Table 8-6.

Table 8-6: PLNB Habitat Types in the Development Envelope

Habitat type	Habitat importance	Extent in DE (ha)
Rocky escarpment (ridges/mesa/cliffs/outcrops/breakaways)	Critical habitat (potential roosting)	2,123.25
Hills/ranges/plateaux		1,322.34
Gorges/gullies		41.51
Drainage line/river/creek (major)	Critical habitat (foraging)	1,657.22
All other habitats	Supporting habitat (foraging)	83,984.97

The rocky escarpment (ridges/mesa/cliffs/outcrops/breakaways), hills/ranges/plateaux and gorges/gullies habitats were reported to be of 'Excellent' condition (ecologia, 2025b). The Drainage line/river/creek (major) is reported to be in 'Degraded' to 'Good' condition (ecologia, 2025b).

The other supporting habitats within the DE which provide suitable foraging habitat include:

- 2,092.13 ha of drainage line/river/creek (minor),
- 12.48 ha of granite outcrops (flat dome),
- 5,366.12 ha of plain (cracking clays),
- 75,547.94 ha of plain (stony/gibber),
- 392.02 ha of woodland (closed), and
- 574.28 ha of woodland (open).

The condition of these habitats are reported in Section 8.4.1.1 (in Table 8-2) and ranged from 'Poor' to 'Excellent' (ecologia, 2025b).

The low activity rates recorded across the DE suggests the utilisation of habitat within the DE is most likely restricted to foraging and transit during the dry season (as very little activity was detected during the wet season) (ecologia, 2025b).

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Legend

- Development Envelope
- GOV Towns
- Major Roads
- Fortescue Rail
- Roy Hill Rail
- Indicative Disturbance Footprint
- Approved Disturbance (Nullagine Pilot Wind Farm)
- Pilbara Leaf-Nosed Bat

Critical Fauna Habitats

- Drainage Line/River/ Creek (major)
- Gorges/Gullies
- Hills/Ranges/Plateaux
- Rocky Escarpments (Ridges/Mesa/Cliffs/ Outcrops/Breakaways)

Microhabitat Locations

- Date Palm
- Artificial pool/waterhole
- Non-permanent pool/ waterhole
- Permanent pool/ waterhole
- Stick nest

Data Source(s):
Aerial, Fortescue and ESRI
All other data, Fortescue, 2025

N

0 2 4 6 8 10
Kilometers

Figure 8-6
Pilbara Leaf-nosed Bat
Critical Habitat and Records

Requested By: R. Dorji
Date: 1/29/2026
Drawn By: R. Kerr
Size: A4L
Revised By: rykerr
Revision: 0
Approved By:
Confidentiality: 0
Scale: 1:300,000
Coordinate System: GDA 1994 MGA Zone 50
Project Name: 4519OP002_MP_EN_0093_PartIV_2
Document Name: 4519OP002_MP_EN_0093_022_r0_PLNB_Habitats

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Grey Falcon (*Falco hypoleucos*) – Recorded

Species Background Information

The Grey Falcon is an elusive species considered the rarest of the falcon species. It is endemic to mainland Australia and consists of a single population (TSSC, 2020). The Grey Falcon is a medium-sized raptor with a sleek, grey plumage, thick chest and long wings with dark tips (TSSC, 2020). The Grey Falcon is listed as Vulnerable under the EPBC Act and the BC Act (TSSC, 2020).

Abundance and Distribution

Climate characteristics appear to play a crucial role in the Grey Falcon's distribution as the species is confined to areas with the highest annual average temperatures and an average rainfall of less than 500 mm (Schoenjahn, 2013). The species is found within inland Australia's arid and semi-arid zones from west or north of the Great Dividing Range from Queensland to Victoria, the northern two-thirds of South Australia and north of latitude 26°S in WA (BirdLife International, 2024).

The total population is estimated to be less than 1,000 mature individuals (Mullin *et al*.,2020). The Conservation Advice for the Grey Falcon does not list any important populations nor important sites. With no biogeographical features that would split the population, it is unlikely that there are any sub populations. Therefore, as only one population occurs in Australia (Marchant & Higgins, 1999), (with no separate 'important populations" defined) and that population is by association important (because it is a Threatened species), the individuals recorded within the DE are considered part of an important population.

Habitat Preferences

Grey Falcons can be found in timbered lowland plains, especially *Acacia* shrublands crossed by tree-lined watercourses (ecologia, 2025b). The species hunts in treeless areas such as tussock grassland and open woodlands, especially during winter (TSSC, 2020). Grey Falcons do not build their own nests, instead using old stick-nests of other bird species in trees or on artificial structures such as telecommunication towers and powerline poles (ecologia, 2025b).

The Grey Falcon is a specialist predator, primarily of birds including doves, pigeons, parrots, cockatoos and finches (ecologia, 2025b). The species usually catches their prey in aerial pursuit with a characteristic fast and level flight, low to the ground (NT Government, 2021). In addition to birds, the species has also been known to hunt flying insects and predate on mammals, reptiles and birds from a high perch (Schoenjahn *et al.,* 2022). The species is expected to be found at low altitudes within the DE, especially during foraging activity.

Threats

The Conservation Advice for the Grey Falcon (TSSC, 2020) identifies that the key threats to the species are cat predation, increased temperatures in arid and semi-arid Australia, habitat loss and fragmentation (including from grazing by exotic herbivores and nest shortage). Additional key threats include direct mortality, demographic and genetic stochastic events (increased by small population size), disturbance from birdwatchers and photographers and egg harvesting and falconry.

Known Populations in the Vicinity of the DE and Broader Region

According to the DBCA database, there are nine records within 40 km of the DE, recorded between 1994 and 2016. None of these records are within the DE, with the closest record being approximately 67 m from the DE and dating from 1997.

The Grey Falcon was recorded in the DE on 23 occasions during the recent field surveys (ecologia, 2025b and ecologia, 2026). Ecologia (2026) considers there is at least one breeding pair of Grey Falcons inhabiting the DE. There were observations in the drainage line/river/creek (major and minor), woodland (open) plain (stony/gibber) and cleared habitats (ecologia, 2025b; ecologia, 2026).

Species Habitat Extent, Quality and Importance

Habitat critical to the survival of the Grey Falcon is not defined within the Conservation Advice (TSSC, 2020) and there is no Recovery Plan or Listing Advice available for this species. Despite this, habitats within the DE that may provide nesting habitat have been defined as critical to the survival of the species (ecologia, 2025b).

At least 11 suitably sized stick nests were recorded within minor and major drainage lines within the DE (ecologia, 2025b), representing potential future nesting habitat for the species. A Grey Falcon was initially observed exhibiting nest defence behaviour against other raptors. Subsequent observations confirmed the presence of a female Grey Falcon attending an active nest (which is a reused Whistling Kite nest). A permanent water pool was present approximately 80 m east of the nest within the creek. Follow-up observations in September 2025, which fall outside the 24-month survey period, recorded a single well-developed chick in the nest, with two adult Grey Falcons observed nearby displaying defensive and foraging behaviours (ecologia, 2026). The location of this nest is shown in Figure 8-7.

Since the species re-uses old nests built by other raptors and corvids in eucalypt-lined drainage lines and waterholes, it may use drainage line/river/creek (major) habitat for nesting. All other habitats may be used for hunting. The extent of the potential Grey Falcon habitat present in the DE is shown in Table 8-7 and the critical habitat for the Grey Falcon is shown in Figure 8-7.

Table 8-7: Grey Falcon Habitat Types in the Development Envelope

Habitat type	Habitat importance	Extent in DE (ha)
Drainage line/river/creek (major)	Critical habitat (nesting)	1,657.22
All other habitat	Supporting habitat (hunting)	87,472.07

The drainage line/river/creek (major) habitat is considered critical to the survival of the Grey Falcon as it provides suitable nesting habitat for the species. This habitat was reported to be of ‘Degraded’ to ‘Good’ habitat condition (ecologia, 2025b).

The other habitats within the DE which provide suitable foraging habitat include:

- 2,123.25 ha of rocky escarpments (ridges/mesa/cliffs/outcrops/breakaways),
- 2,092.13 ha of drainage line/river/creek (minor),
- 12.48 ha of granite outcrops (flat dome),

- 1,322.34 ha of hills/ranges/plateaux,
- 41.51 ha of gorges/gullies,
- 5,366.12 ha of plain (cracking clays),
- 75,547.94 ha of plain (stony/gibber),
- 392.02 ha of woodland (closed), and
- 574.28 ha of woodland (open).

The habitat condition of these habitats is reported in Section 8.4.1.1 (in Table 8-2) and ranged from ‘Poor’ to ‘Excellent’ (ecologia, 2025b).

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LOCATION MAP

Legend

- Development Envelope
- GOV Towns
- Major Roads
- Fortescue Rail
- Roy Hill Rail
- Indicative Disturbance Footprint
- Approved Disturbance (Nullagine Pilot Wind Farm)
- Grey Falcon
- Active Nest

Critical Fauna Habitats - Grey Falcon

- Drainage Line/River/ Creek (major)

Critical Fauna Habitats - Peregrine Falcon

- Drainage Line/River/ Creek (major)
- Rocky Escarpments (Ridges/Mesa/Cliffs/ Outcrops/Breakaways)

Microhabitat Locations

- Date Palm
- Artificial pool/waterhole
- Non-permanent pool/ waterhole
- Permanent pool/ waterhole
- Stick nest

Data Source(s):
Aerial, Fortescue and ESRI
All other data, Fortescue, 2025

N

0 2 4 6 8 10
Kilometers

Figure 8-7
Grey Falcon and Peregrine Falcon Critical Habitat and Records

Requested By: R. Dorji
Date: 1/29/2026
Drawn By: R. Kerr
Size: A4L
Revised By: rykerr
Revision: 0
Approved By:
Confidentiality: 0
Scale: 1:300,000
Coordinate System: GDA 1994 MGA Zone 50
Project Name: 4519OP002_MP_EN_0093_PartIV_2
Document Name: 4519OP002_MP_EN_0093_023_r0_GF_PF_Habitats

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Pilbara Olive Python (*Liasis olivaceus barroni*) - Recorded

Species Background Information

The Pilbara Olive Python is a subspecies of the Olive Python. The subspecies has dull olive brown skin with a white/cream belly, pale lips, smooth scales in 55-80 cm rows at the mid-body and grows to 6.5 m in length but typically between 3-4 m (DBCA, 2023b). The Pilbara Olive Python is listed as Vulnerable under the EPBC Act and the BC Act.

Abundance and Distribution

The Pilbara Olive Python is known only from ranges within the Pilbara region in north-western Australia. As per the species' Conservation Advice, it is known to occur in twenty-one locations within this region (DBCA, 2023b) such as Pannawonica, Millstream, Tom Price and Burrup Peninsula (Pearson, 1993; Pearson, 2006). However, Fortescue survey database records and DBCA data confirm the species is found more widely in the region, recorded at over 50 locations and due to the cryptic nature of this species (DBCA, 2023b), there are likely further records within the broader Pilbara region. The species occurs throughout the Pilbara at all elevations within its range, extending south into the Gascoyne region as far as Yinnetharra Station (DBCA, 2023b). The cryptic nature of the Pilbara Olive Python makes it difficult to reliably estimate the total population (DBCA, 2023b).

Habitat Preferences

The Pilbara Olive Python prefers deep gorges and water holes within the Pilbara region (Pearson, 1993). During the winter months, the species hides away from water sources in caves and rock crevices. The species is adept at swimming and uses water holes to hunt, in warmer weather, the species is usually found near water and rocky outcrops (Swan, 2007). Despite the species' preference for ephemeral or permanent water sources, they have a large home range and can be recorded some distance from these features in rocky habitats. Critical habitat has not been defined for this species due to a lack of research on habitat use and life history (DBCA, 2023b). Potential habitat has been estimated to be concentrated in the southern and central areas of the Pilbara region, although the species does not occur exclusively in these areas (DBCA, 2023b).

Threats

The key threats to Pilbara Olive Python are poorly understood and highly speculative. Habitat destruction due to mining processes and infrastructure development is likely to have a profound impact on local populations (DBCA, 2023b). Other threats to the Pilbara Olive Python include predation by feral animals such as cats and foxes as well as predation of food sources and destruction of habitat due to gas and mining development (DEWHA, 2008). Potential threats include loss of suitable prey (especially in coastal locations with higher prevalence of foxes) and death resulting from misidentification as a poisonous brown snake (Pearson, 2006; Swan, 2007).

Known Populations in the Vicinity of the DE and Broader Region

According to the DBCA database, there are 22 records within 40 km of the DE, recorded between 2011 to 2024. Three of these records are from within the DE dating from 2011, 2019 and 2022.

The species was recorded on two occasions during the recent surveys within the plain (stony/gibber) habitat; once within the Survey Area (approximately 7 km from the DE) and once inside the DE (ecologia, 2025b).

Species Habitat Extent, Quality and Importance

Critical habitat for the Pilbara Olive Python is not listed within the species' Conservation Advice however, it states that the species will spend the cooler months in caves and rocky crevices (DEWHA, 2008). Ecologia (2025b) report that critical habitat for the species includes areas which may contain escarpments and gorges, preferably with rock crevices and outcrops near water holes.

As considered in ecologia (2025b), the hills/ranges/plateaux, gorges/gullies, drainage lines/river/creek (major) and rocky escarpment (ridges/mesa/cliffs/outcrops/breakaways) habitats provide critical habitat for the species, as shown in Figure 8-8. The extent of potential Pilbara Olive Python habitat present in the DE is shown in Table 8-8.

Table 8-8: Pilbara Olive Python Habitat Types in the Development Envelope

Habitat type	Habitat importance	Extent in DE (ha)
Hills/ranges/plateaux	Critical habitat (shelter, foraging, dispersal)	1,322.34
Gorges/gullies		41.51
Rocky escarpments (ridges/mesa/cliffs/outcrops/breakaways)		2,123.25
Drainage lines/river/creek (major)	Critical habitat (foraging, dispersal)	1,657.22

The hills/ranges/plateaux, gorges/gullies, and rocky escarpment (ridges/mesa/cliffs/outcrops/ breakaways) provide potential shelter, foraging and dispersal habitat for the Pilbara Olive Python and are considered critical habitat. Additionally, drainage lines/river/creek (major) provides habitat considered critical for foraging and dispersal.

The habitat condition of these habitats is reported in Section 8.4.1.1 (in Table 8-2) and ranged from 'Good' to 'Excellent' (ecologia, 2025b).

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Legend

- Development Envelope
- GOV Towns
- Major Roads
- Fortescue Rail
- Roy Hill Rail
- Indicative Disturbance Footprint
- Approved Disturbance (Nullagine Pilot Wind Farm)
- Pilbara Olive Python

Critical Fauna Habitats

- Drainage Line/River/ Creek (major)
- Gorges/Gullies
- Hills/Ranges/Plateaux
- Rocky Escarpments (Ridges/Mesa/Cliffs/ Outcrops/Breakaways)

Microhabitat Locations

- Date Palm
- Artificial pool/waterhole
- Non-permanent pool/ waterhole
- Permanent pool/ waterhole
- Stick nest

Data Source(s):
Aerial, Fortescue and ESRI
All other data, Fortescue, 2025

N

0 2 4 6 8 10
Kilometers

Figure 8-8
Pilbara Olive Python
Critical Habitat and Records

Requested By: R. Dorji
Date: 1/29/2026
Drawn By: R. Kerr
Size: A4L
Revised By: rykerr
Revision: 0
Approved By:
Confidentiality: 0
Scale: 1:300,000
Coordinate System: GDA 1994 MGA Zone 50
Project Name: 4519OP002_MP_EN_0093_PartIV_2
Document Name: 4519OP002_MP_EN_0093_024_r0_POP_Habitats

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Ghost Bat (*Macroderma gigas*) - Recorded

Species Background Information

The Ghost Bat is the largest microchiropteran bat in Australia and is strictly carnivorous (van Dyck & Strahan, 2008). The species is light to dark grey, with long ears, large eyes, a simple nose-leaf and no tail. The species is listed as Vulnerable under the BC Act and EPBC Act (TSSC, 2016a).

Abundance and Distribution

The Ghost Bat was historically distributed widely across Australia (TSSC, 2016a). Currently, the species' range is discontinuous, with geographically disjunct colonies occurring in the Pilbara, Kimberly, Northern Territory, the Gulf of Carpentaria and coastal and near coastal eastern Queensland (TSSC, 2016a). Due to the geographically disjunct nature of colonies, the species has genetic variations. This includes the Pilbara populations being distinguished from others (TSSC, 2016a). Therefore, the individuals that are recorded within the DE are considered a part of an important population.

There are no robust measures of abundance across the species range. The global Ghost Bat population is estimated to be less than 10,000 individuals with a decreasing trend (DBCA, 2023b). It is estimated that the WA population is around 4,300 – 6,000 individuals, with approximately 1,300 – 2,000 individuals estimated from the Pilbara population (TSSC, 2016a).

Habitat Preferences

Ghost Bats are known to move between a number of caves seasonally or as dictated by weather conditions and/or foraging opportunities (Bat Call, 2021). The species can occur over a range of landforms and inhabit areas with caves suitable for roost sites (Churchill, 2009), which includes deep natural caves, disused mines and rock crevices that have a stable temperature and moderate to high relative humidity (TSSC, 2016a).

In the Pilbara, the preferred roosting habitat is caves beneath bluffs of low, rounded hills composed of Marra Mamba geology and granite rock piles (ecologia, 2025b). Ghost Bats have also been recorded within sandstone caves, under boulder piles and in abandoned mines (Churchill, 1998). These natural roost caves can be important breeding sites (TSSC, 2016a).

There is currently limited confirmed data regarding foraging habitat for the species. There are studies (using Very High Frequency radio tracking and GPS/satellite tracking equipment) that show the species can forage over larger areas, up to 12 km from their diurnal roost, with trip lengths of up to 30 km (Augusteyn *et al.*, 2017). A more recent study showed the average radial distance from the roost was 8.5 km, and the maximum radial distance 17.7 km (Bat Call, 2023). Bats travelling to distant sites have also been recorded between 20 and 30 km from their diurnal roost at night (Bat Call, 2021). A study in the Pilbara indicates the species prefers to forage in productive plain areas, such as isolated trees and trees on the edge of thin thickets on the plains or trees along the edges of watercourse woodlands (Bat Call, 2021).

The species may forage over large areas, depending on the productivity of the landscape (Churchill, 1998). The presence of pools of water is a critical factor of Ghost Bat foraging habitat (Armstrong, 2001). The species forages in cave entrances, drainage lines, along riparian corridors, on alluvial plains, and in supporting mulga woodland and tussock grasslands (Cramer *et al.*, 2022). Currently, there is no documented information on the

importance of surface drinking water for Ghost Bats; however, it is suggested that this species requires surface water for drinking, and water sources in proximity to day roost caves are therefore likely to be important (Bat Call, 2021).

Threats

The Ghost Bats Conservation Advice (TSSC, 2016a) lists the key threat as habitat loss and degradation, especially due to mining activities. Other threats include disturbance of breeding sites, modification of foraging habitat, collision with fences, collapse or reworking of old mines, contamination by mining residue at roost sites (which may reduce rates of survival or reproduction), disease, poison by cane toads and competition for prey with foxes and feral cats. Emerging future threats include future invasion of cane toads and large-scale wind farm developments (DBCA, 2023b).

Known Populations in the Vicinity of the DE and Broader Region

According to the DBCA database, there are 63 records within 40 km of the DE, recorded between 1956 to 2022. This includes one record approximately 10 km from the DE from 2016.

During the BBSUS survey, this species was recorded on motion camera within the drainage line/river/creek (major) habitat in the northern extent of the DE (ecologia, 2025b and ecologia, 2026). No echolocation nor social calls were detected by bat detectors during surveys (ecologia, 2025b and ecologia, 2026).

Species Habitat Extent, Quality and Importance

Habitat critical to the survival of the Ghost Bat is not defined in the Conservation Advice (TSSC, 2016a). Ecologia (2025b) did not locate any suitable roosting caves within the DE, with no low-time calls recorded (calls within 20 minutes of sunset or sunrise). Roosting opportunities may occur in the rocky escarpment (ridges/mesa/cliffs/ outcrops/breakaways), hills/ranges/plateaux and gorges/gullies habitat types (ecologia, 2025b). Therefore, these habitats are considered critical habitat, as shown in Figure 8-9. Foraging habitat with water sources is important for the species (Bat Call, 2021), therefore the drainage line/river/creek (major) habitat type is also considered critical habitat for the Ghost Bat.

All other habitat types are considered potential foraging habitat and are considered supporting habitat for the Ghost Bat (ecologia, 2025b). The extent of potential Ghost Bat habitat present in the DE is shown in Table 8-9.

Table 8-9: Ghost Bat Habitat Types in the Development Envelope

Habitat type	Habitat importance	Extent in DE (ha)
Rocky escarpment (ridges/mesa/cliffs/outcrops/breakaways)	Critical habitat (potential roosting)	2,123.25
Hills/ranges/plateaux		1,322.34
Gorges/gullies		41.51
Drainage line/river/creek (major)	Critical habitat (foraging)	1,657.22
All other habitats	Supporting habitat (foraging)	83,984.97

The rocky escarpment (ridges/mesa/cliffs/outcrops/breakaways), hills/ranges/plateaux and gorges/gullies habitats were reported to be of ‘Excellent’ condition (ecologia, 2025b). The Drainage line/river/creek (major) is in ‘Degraded’ to ‘Good’ condition (ecologia, 2025b).

The other supporting habitats within the DE which provide suitable foraging habitat include:

- 2,092.13 ha of drainage line/river/creek (minor),
- 12.48 ha of granite outcrops (flat dome),
- 5,366.12 ha of plain (cracking clays),
- 75,547.94 ha of plain (stony/gibber),
- 392.02 ha of woodland (closed), and
- 574.28 ha of woodland (open).

The condition of these habitat types are reported in Section 8.4.1.1 (in Table 8-2) and ranged from ‘Poor’ to ‘Excellent’ (ecologia, 2025b).

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Legend

- Development Envelope
- GOV Towns
- Major Roads
- Fortescue Rail
- Roy Hill Rail
- Indicative Disturbance Footprint
- Approved Disturbance (Nullagine Pilot Wind Farm)
- Ghost Bat

Critical Fauna Habitats

- Drainage Line/River/ Creek (major)
- Gorges/Gullies
- Hills/Ranges/Plateaux
- Rocky Escarpments (Ridges/Mesa/Cliffs/ Outcrops/Breakaways)

Microhabitat Locations

- Date Palm
- Artificial pool/waterhole
- Non-permanent pool/ waterhole
- Permanent pool/ waterhole
- Stick nest

Data Source(s):
Aerial, Fortescue and ESRI
All other data, Fortescue, 2025

N

0 2 4 6 8 10
Kilometers

Figure 8-9
Ghost Bat
Critical Habitat and Records

Requested By: R. Dorji
Drawn By: R. Kerr
Revised By: rykerr
Approved By:
Scale: 1:300,000
Coordinate System: GDA 1994 MGA Zone 50
Project Name: 4519OP002_MP_EN_0093_PartIV_2
Document Name: 4519OP002_MP_EN_0093_025_r0_GB_Habitats

Date: 1/29/2026
Size: A4L
Revision: 0
Confidentiality: 0

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Night Parrot (*Pezoporus occidentalis*) – Moderate Likelihood of Occurrence

Species Background Information

The Night Parrot is a small, ground-feeding, nocturnal parrot that is endemic to Australia (ecologia, 2025b). The species is medium sized (approximately 22-25 cm long) with characteristic bright green body, black and yellow markings and a yellow belly (Higgins, 1999). The Night Parrot is listed as Endangered under the EPBC Act and Critically Endangered under the BC Act.

Abundance and Distribution

Historic records indicate that the Night Parrot was once distributed over much of arid and semi-arid Australia, but the species was thought to be extinct for a long period of time before sightings near Fortescue Marsh in 2005 (ecologia, 2025b).

The elusive nature of the Night Parrot means that there are sparse records available of its current abundance and distribution. Despite improvement in detection methods, the number of Night Parrots in WA is unknown (DBCA, 2023b). The current distribution of the Night Parrot in WA is believed to be associated with the northern and central areas of WA's interior (DBCA, 2024d). The species is currently known from at least eight sites in northern WA (DBCA, 2023b). Recent records of the Night Parrot indicate that populations may persist in the Pilbara region (Night Parrot Recovery Team, pers comm., 2016, as referenced in TSSC (2016c)).

Habitat Preferences

The Night Parrot primarily forages on the ground and occupies a variety of habitats. It is most commonly associated with structurally complex, long-unburnt *Triodia* species on flat or low-lying terrain, as well as fertile plains dominated by chenopod and grass species (Murphy *et al*., 2017). Recent studies indicate that roost sites are typically located within 10 km of feeding grounds with key seed-producing plants, rather than being strictly associated with spinifex or samphire vegetation (Murphy *et al.*, 2017). The species also depends on succulent vegetation in areas without standing water (Kearney *et al.*, 2016).

Evidence suggests that Night Parrots remain in the same area for extended periods where permanent water sources are available (Murphy *et al.*, 2017). However, in regions where surface water is ephemeral, their movement is likely influenced by water availability.

The structure of *Triodia* recorded by Jackett *et al*. (2017) closely resembles that described by Murphy *et al.* (2017) at Pullen Pullen Reserve, characterized by dense, ring-shaped formations. Murphy *et al.* (2017) documented a nest in *Triodia longiceps*, while Jackett *et al.* (2017) recorded one in *Triodia aff. plurinervata.* This suggests that nest site selection is more dependent on the structure of spinifex rather than the size of the spinifex patch or substrate type. Additionally, the proximity of dense ground-layer vegetation (e.g*., Triodia*) to suitable foraging areas likely influences nest and roost site selection, with adjacent samphire and herb fields potentially serving as a food source (Jackett *et al.,* 2017; Murphy *et al.,* 2017).

Within WA, most high probability and confirmed records have been associated with drainage lines, and paleo-drainage lines in particular (DBCA, 2023b).

Threats

The Night Parrot faces several threats, including predation by introduced species, increased fire extent, and potential competition with introduced herbivores such as cattle, sheep, and European rabbits (Lesenberg *et al.*, 2023). Climate change, particularly heat-induced water stress, is also a concern (Kearney *et al.*, 2016). Additional assumed threats include habitat loss and modification, human-induced fire events, invasive and domestic species, disease, and the collection of birds and/or eggs (TSSC, 2016d).

Known Populations in the Vicinity of the DE and Broader Region

The DBCA database shows 11 records of the species within 40 km of the DE, including a cluster of six records from 2022, located 20 km from the DE associated with the Fortescue Marsh. None of these records are located within the DE.

Targeted Night Parrot surveys were undertaken as a part of the ecologia (2025b) survey using acoustic monitoring. Night Parrot calls were not recorded during recent surveys, and it is considered unlikely that a long-term stable Night Parrot roosts exist in the areas immediately surrounding the points sampled. It is also considered unlikely that Night Parrots were foraging in proximity to these surveyed points at the time of sampling (ecologia, 2025b). However, the Night Parrot is considered moderately likely to occur in the DE based on the modelled distribution of the species and presence of suitable roosting and foraging habitat within the DE.

Species Habitat Extent, Quality and Importance

Although the Night Parrot was not recorded during the field surveys (ecologia, 2025b; ecologia, 2026), the following habitats are considered to represent potential critical roosting habitat for the species:

- Patches of long unburnt vegetation with *Triodia longiceps* (DBCA, 2024d)*:* Vegetation units mapped by ecologia (2025b) within the DE that contain *Triodia longiceps* are AaEp, AcTe, AeTe, EcAcCs, ElAbTl, EvAcCc, as defined in Section 7.4.3. DBCA fire mapping (DBCA, 2024c) indicates that 4,882.01 ha of vegetation units containing *Triodia longiceps* within the DE has not been burnt in the past 18 years (since 2007).

- Patches of long unburnt plain (stony/gibber) habitat: DBCA fire mapping (DBCA, 2024c) indicates that 17,941.43 ha of plain (stony/gibber) habitat within the DE has not been burnt in the past 18 years (since 2007). Note that the 17,941.43 ha of long unburnt plain (stony/gibber) habitat excludes the areas that also overlap the long unburnt vegetation with *Triodia longiceps* (described in the dot point above). Therefore, the overlapping areas have not been counted twice.

Many areas of vegetation identified as potentially encompassing long unburnt *Triodia longiceps* were associated with major drainage lines and are considered unlikely to provide suitable roosting habitat for the Night Parrot (ecologia, 2025b). Despite this, a conservative approach has been applied, and these areas have been considered potential roosting critical habitat.

The plain (cracking clays) habitat within the DE may provide foraging habitat for the Night Parrot and is considered supporting habitat. Widespread cattle grazing and trampling throughout the DE is likely to prevent annual access to potential foraging resources within the

plain (cracking clays) habitat. Potential foraging resources identified within the DE are unlikely to sustain a permanent population of the species during the dry season and foraging resource availability during the wet season is likely to be restricted to periods following sustained rainfall and areas where cattle are excluded (ecologia, 2025b). Use of seasonal grasses herbland within the plain (cracking clays) habitat type by the Night Parrot is likely to be limited to areas with low/no cattle impacts, during periods of high seasonal productivity only.

Fresh water sources within the DE may be used by the Night Parrot, including pastoral dams and troughs, permanent and semi-permanent pools (including Bonnie Pool) and major drainage lines (during periods of seasonal inundation). These water sources are included in the habitats described above.

A lack of records of the Night Parrot has contributed to the inability to classify a definitive critical habitat for the species. As such, habitat critical to the survival of the species has not been identified in the Conservation Advice (TSSC, 2016d). The patches of long unburnt plain (stony/gibber) and patches of long unburnt vegetation with *Triodia longiceps* are considered critical habitat as they may be used by the Night Parrot for roosting, as shown in Figure 8-10. These habitats/ vegetation units were reported as 'Degraded' to 'Excellent' habitat condition (ecologia, 2025b).

The plain (cracking clays) habitat is considered supporting habitat as it may be used by the Night Parrot for foraging. This habitat was reported as 'Degraded' to 'Excellent' habitat condition (ecologia, 2025b).

The extent of potential Night Parrot habitat within the DE is shown in Table 8-10.

Table 8-10: Night Parrot Habitat Types in the Development Envelope

Habitat type	Habitat importance	Extent in DE (ha)
Patches of long unburnt vegetation with *Triodia longiceps*	Critical habitat (roosting)	4,882.01
Patches of long unburnt plain (stony/gibber)		17,941.43
Plain (cracking clays)	Supporting habitat (foraging)	5,366.12

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Legend

- Development Envelope
- GOV Towns
- Major Roads
- Fortescue Rail
- Roy Hill Rail
- Indicative Disturbance Footprint
- Approved Disturbance (Nullagine Pilot Wind Farm)
- Patches of long unburnt plain (stony/gibber)
- Patches of long unburnt vegetation with Triodia longiceps

Microhabitat Locations

- Date Palm
- Artificial pool/waterhole
- Non-permanent pool/ waterhole
- Permanent pool/ waterhole
- Stick nest

Data Source(s):
Aerial, Fortescue and ESRI
All other data, Fortescue, 2025

N

0 2 4 6 8 10
Kilometers

Figure 8-10
Night Parrot
Critical Habitat and Records

Requested By: R. Dorji
Date: 1/29/2026
Drawn By: R. Kerr
Size: A4L
Revised By: rykerr
Revision: 0
Approved By:
Confidentiality: 0
Scale: 1:300,000
Coordinate System: GDA 1994 MGA Zone 50
Project Name: 4519OP002_MP_EN_0093_PartIV_2
Document Name: 4519OP002_MP_EN_0093_026_r0_NP_Habitats

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Australian Painted Snipe (*Rostratula australis*) – Moderate Likelihood

Species Background Information

The Australian Painted Snipe is a wading bird approximately 24-30 cm in length with a wingspan of 50-54 cm (DSEWPaC, 2013). The species has a brown body with white markings around the eyes and extending down the back of the body, baring likeness to a harness. The male is smaller than females and has a duller head pattern (DSEWPaC, 2013). There is no seasonal variation in plumage, and the juvenile birds are similar in appearance to adult males (Marchant & Higgins, 2003). The species is listed as Endangered under both the EPBC Act and the BC Act.

Abundance and Distribution

The species is considered to have a wide geographic distribution, as according to the Conservation Advice the current extent of occurrence is estimated to be stable at 7,100,000 km^2 (DSEWPC, 2013). Records from the past two decades provide evidence that the Australian Painted Snipe occurs more widely and frequently in remote arid and tropical regions of Australia than previously understood (DSEWPaC, 2013). The Murray-Darling Basin, Queensland Channel Country, Fitzroy Basin of Central Queensland, south-eastern South Australia and adjacent parts of Victoria represent important areas for this species (Rogers *et al.,* 2005). While the total population size of the species is unknown, estimates range from a few hundred to 5,000 mature adults (DoE, 2025a).

Habitat Preferences

The Australian Painted Snipe occurs in shallow freshwater wetlands (both ephemeral and permanent), generally with good cover of grasses, rushes and reeds, low scrub, *Muehlenbeckia* spp., open timber or samphire (DSEWPaC, 2013). The species is most common in eastern Australia, however, has been recorded at wetlands in all states and territories (Barrett *et al*, 2003; Blakers *et al*., 1984).

Threats

The Conservation Advice for the Australian Painted Snipe (DSEWPaC, 2013) identifies several threats to the species such as: the loss and degradation of wetlands; loss of breeding habitat in the Murray-Darling Basin; grazing and associated trampling of wetland vegetation/nests; reduced rainfall and runoff in the Murray-Darling Basin associated with climate change; and predation by feral animals.

Known Populations in the Vicinity of the DE and Broader Region

According to the DBCA database, there were two records in 2012 within 40 km of the DE, in the vicinity of the Fortescue Marsh. There are no DBCA records of this species within the DE and the species was not recorded in recent surveys (ecologia, 2025b; ecologia, 2026).

Species Habitat Extent, Quality and Importance

Critical habitat for the species is not reported within the species Conservation Advice (DSEWPaC, 2013).

Within the DE, the species may use the drainage lines/rivers/creeks (major) for dispersal and foraging. This habitat was reported as ‘Degraded’ to ‘Good’ condition (ecologia, 2025b).

Should the species be present in the DE, it is expected to occur intermittently whilst travelling to more suitable habitat (i.e., the Fortescue Marsh 9.3 km south-east of the DE and 25 km from nearest wind turbine).

The extent of potential Australian Painted Snipe habitat present in the DE is shown in Table 8-11.

Table 8-11: Australian Painted Snipe Habitat Types in the Development Envelope

Habitat type	Habitat importance	Extent in DE (ha)
Drainage lines/rivers/creeks (major)	Supporting habitat (dispersal and foraging)	1,657.22

8.4.3 Other Specially Protected Fauna

Other Specially Protected fauna are fauna of special conservation need that are dependent on ongoing conservation intervention, to prevent them becoming eligible for listing as Threatened under the BC Act. The Peregrine Falcon was the only Other Specially Protected fauna recorded in the ecologia (2025b) survey. Information about this species, including species presence, is discussed in the context of potential habitat within the DE.

Peregrine Falcon (*Falco peregrinus*) – High Likelihood

Species Background Information

The Peregrine Falcon is a large raptor (bird of prey) with a black hood, blue-black upperparts and a creamy-white chin, throat and underparts. The species has yellow eye ring and bill with a black tip (BirdLife Australia, 2017). It is classified as Other Specially Protected under the BC Act.

Abundance and Distribution

The Peregrine Falcon is widespread across Australia. However, it requires specific nesting sites as outlined below (ecologia, 2025b).

This species can be found in most habitats, from arid zones to rainforests and at most altitudes. Adult individuals have a home range of 20 km to 30 km throughout the year. Whilst young individuals disperse widely, they often return to their original home area to breed (BirdLife Australia, 2017).

Habitat Preferences

The Peregrine Falcon inhabits cliffs and gorges, inland drainage systems, lowland plains and *Acacia* shrublands intersected by water courses (ecologia, 2025b). The species hunts in all habitats. This species does not build nests but requires cliffs, rocky outcrops, or large tree hollows (Johnstone & Storr, 1998).

Threats

Threats to the species include collisions with infrastructure (BirdLife Australia, 2017), land clearing and chemical residues, which can cause reproductive failure and an inability to maintain populations (BirdLife Australia, 2023).

Known Populations in the Vicinity of the DE and Broader Region

According to the DBCA database, there are 12 records within 40 km of the DE, recorded between 2003 and 2022. The closest record is approximately 2 km south of the DE and was recorded in 2011. There are no DBCA records of this species within the DE and the species was not recorded in the recent surveys (ecologia, 2025b; ecologia, 2026).

Species Habitat Extent, Quality and Importance

Critical habitat is not defined for this species; however, it is assumed that nesting habitat is critical for this species.

Suitable nesting habitat within the DE includes the tree hollows and breakaways, however, due to its widespread nature, the species may also overfly all habitats of the DE intermittently (ecologia, 2025b). There are suitable cliffs and overhangs within the rocky escarpment (ridges/mesa/cliffs/outcrops/breakaways) habitat and large trees within the drainage line/river/creek (major) habitat. Therefore, suitable nesting habitat within the DE includes the drainage line/river/creek (major) and rocky escarpment (ridges/mesa/cliffs/ outcrops/breakaways) habitats, and these habitats are considered critical to the survival of the species, as shown on Figure 8-7. The condition of these habitats ranged from 'Degraded' to 'Excellent' (ecologia, 2025b).

The species has the potential to use all habitats while foraging. The extent of potential Peregrine Falcon habitat present in the DE is shown in Table 8-12.

Table 8-12: Peregrine Falcon Habitat Types in the Development Envelope

Habitat type	Habitat importance	Extent in DE (ha)
Rocky escarpments (ridges/mesa/cliffs/outcrops/breakaways)	Critical habitat (nesting and foraging)	2,123.25
Drainage line/river/creek (major)		1,657.22
All other habitats	Supporting habitat (foraging)	85,348.82

The other habitats within the DE which provide suitable foraging habitat include:

- 2,092.13 ha of drainage line/river/creek (minor),
- 12.48 ha of granite outcrops (flat dome),
- 41.51 ha gorges/gullies,
- 1,322.34 ha of hills/ranges/plateaux,
- 5,366.12 ha of plain (cracking clays),
- 75,547.94 ha of plain (stony/gibber),
- 392.02 ha of woodland (closed), and
- 574.28 ha of woodland (open).

The condition of these habitats is discussed in Section 8.4.1.1 (in Table 8-2) and ranged from 'Degraded' to 'Excellent' (ecologia, 2025b).

Due to this species' widespread habitat types (ecologia, 2025b), it is unlikely to be restricted to or reliant on the habitat within the DE.

8.4.4 Priority Fauna

DBCA maintains a list of Priority species that have not been assigned statutory protection under the BC Act. This system ranks species from Priority 1 to Priority 4. The following section will discuss Priority fauna that was recorded during the ecologia (2025b) survey or has a 'High' or 'Moderate' likelihood of occurrence in the DE.

Gane's Blind Snake (*Anilios ganei*) – Recorded

Species Background Information

There is limited information available on this species, due to its fossorial lifestyle (ecologia, 2025b). This species is exclusively insectivorous and is thought to burrow into social insect colonies to feed on termites and ants (including their eggs and pupae) (Wilson & Swan, 2021). This species is listed as Priority 1 under the BC Act.

Abundance and Distribution

This species has been recorded within between Newman and Pannawonica within the Pilbara region (Wilson & Swan, 2010; 2021). There is limited information available of this species abundance.

Habitat Preferences

This species has been suggested to prefer subterranean habitats near moist gullies and gorges (Wilson & Swan, 2010; 2021). There are also records from sandy soil vegetated with spinifex and mulga woodland (ecologia, 2025b).

Known Populations in the Vicinity of the DE and Broader Region

According to the DBCA database, there is one record approximately 38 km north of the DE and is from 2009. This species was recorded once during recent surveys within the plain (stony/gibber) habitat (ecologia, 2025b).

Species Habitat Extent, Quality and Importance

Habitat critical to the survival of the Gane's Blind Snake is not defined. The species is likely to utilise the hills/ranges/plateaux, plain (stony/gibber), gorges/gullies and drainage line/river/creek (major) habitats (ecologia, 2025b) as supporting habitat. These habitats were reported as 'Excellent' condition, excluding the drainage line/river/creek (major) habitat which was reported as 'Degraded – Good' (ecologia, 2025b).

The extent of potential Gane's Blind Snake habitat present in the DE is shown in Table 8-13.

Table 8-13: Gane's Blind Snake Habitat Types in the Development Envelope

Habitat type	Habitat importance	Extent in DE (ha)
Hills/ranges/plateaux	Supporting habitat	1,322.34
Plain (stony/gibber)		75,547.94

Habitat type	Habitat importance	Extent in DE (ha)
Gorges/gullies		41.51
Drainage line/river/creek (major)		1,657.22

Brush-tailed Mulgara (*Dasycercus blythi*) - Recorded

Species Background Information

Mulgaras are small carnivorous marsupials with sandy brown fur and grey underparts (NESP Threatened Species Recovery Hub, 2021). The species is approximately 15-20 cm long and characterised by a black and bushy tail with a pointed end. The Brush-tailed Mulgara is predominantly nocturnal and usually shelters in burrow systems during the day. This species is listed as Priority 4 by DBCA.

Abundance and Distribution

The species is found throughout Australia's arid and semi-arid regions (Newman-Martin *et al*., 2023). The Brush-tailed Mulgara's distribution is bound by the Tanami Desert in the north, the Simpson Desert in the east, the Great Victoria Desert in the south and the Carnarvon, Murchison and Pilbara regions in the west (Woinarski *et al*., 2012).

The geographic distribution of the Mulgara has declined since European settlement, predominantly due to domestic cat predation (Newman-Martin *et al*., 2023) and other factors such as rainfall, food resources, burrow availability and fire (Pavey *et al*., 2012). The population of the Brush-tailed Mulgara also fluctuates in response to seasonal conditions (Woinarski *et al*., 2012). Despite this historic decline, the Mulgara population is considered stable, persisting in small, low-density isolated populations during periods of low rainfall (Molyneux *et al*., 2018).

Habitat Preferences

The Brush-tailed Mulgara occurs primarily in spinifex grasslands throughout most of the arid zone and digs burrows in flats between low sand dunes but also uses other vegetation types (often sandplains, grasslands, and woodlands) when mixed with or adjacent to hummock grasslands (NESP Threatened Species Recovery Hub, 2021).

Known Populations in the Vicinity of the DE and Broader Region

According to the DBCA database, there are 18 records within 40 km of the DE, recorded between 1947 and 2016. The closest records include a clustered group of six records approximately 10 km east of the DE from 2016.

This species was recorded within the DE in the plain (stony/gibber) habitat (ecologia, 2025b).

Species Habitat Extent, Quality and Importance

The habitat critical to the survival of the Brush-tailed Mulgara has not been defined. Supporting habitat for the species in the DE occurs within the plain (stony/gibber) habitat type that encompasses spinifex grasslands and substrates for burrowing, as outlined by ecologia (2025b) and shown in Table 8-14. This habitat type was reported as 'Good' to 'Excellent' condition (ecologia, 2025b) Habitats likely to be used by this taxon are common and

widespread within and outside of the DE in the broader Pilbara region, so it is unlikely to be restricted to or reliant on the habitat within the DE ecologia (2025b). Table 8-14

Table 8-14: Brush-tailed Mulgara Habitat Types in the Development Envelope

Habitat type	Habitat importance	Extent in DE (ha)
Plain (stony/gibber)	Supporting habitat (burrowing)	75,547.94

Short-tailed Mouse (*Leggadina lakedownensis*) - Recorded

Species Background Information

The Short-tailed Mouse is a small, nocturnal and solitary rodent (ecologia, 2025b). The species has a light grey-brown body with a pure white belly, blunt snout, short ears and a tail shorter than its body length (DBCA, 2022). The species is listed as Priority 4 by DBCA.

Abundance and Distribution

The species is present across northern Australia from Cape York to the Pilbara, with one population on Thevenard Island (DBCA, 2022). It has also been recorded in hilltops and sandy coastal areas near Onslow and from cracking clay communities from Cape Preston in the west to the northern flanks of the Fortescue Marshes in the east (Halpern Glick Maunsell *et al*., 2001).

Habitat Preferences

The Short-tailed Mouse is predominantly found in habitats seasonally inundated with red or white sandy-clay soils (Moro & Kutt, 2008). The species occupies a variety of different habitats, including spinifex and tussock grasslands, samphire and sedgelands, *Acacia* shrublands, tropical *Eucalypt* and *Melaleuca* woodlands and stony ranges (ecologia, 2025b). In the Pilbara, the species is predominantly found on cracking clays (DBCA, 2022).

Known Populations in the Vicinity of the DE and Broader Region

According to the DBCA database, there are 10 records within 40 km of the DE, recorded predominately in 2004 with one record from 2020. The closest DBCA record is approximately 200 m west of the DE and was recorded in 2004.

Ecologia (2025b) recorded this species on eight occasions within the DE, all of which were within the plain (cracking clays) habitat, except one record in the drainage lines/river/creek (minor) habitat.

Species Habitat Extent, Quality and Importance

Critical habitat is not defined for this species. Within the DE, the species would likely utilise the plain (cracking clays) and drainage line/river/creek (minor) habitats for shelter foraging and dispersal (ecologia, 2025b). These habitats were reported to range from ‘Poor’ to ‘Excellent’ habitat condition (ecologia, 2025b).

Suitable habitat for the Short-tailed Mouse is not restricted to the DE, with the known distribution of the species extending beyond the confines of the DE boundary (ecologia, 2025b).

These habitats are considered supporting habitat for the species. The extent of potential Short-tailed Mouse habitat present in the DE is shown in Table 8-15.

Table 8-15: Short-tailed Mouse Habitat Types in the Development Envelope

Habitat type	Habitat importance	Extent in DE (ha)
Plain (cracking clays)	Supporting habitat (shelter, foraging, dispersal)	5,366.12
Drainage line/river/creek (minor)	Supporting habitat (shelter, foraging, dispersal)	2,092.13

Western Pebble-mound Mouse (*Pseudomys chapmani*) - Recorded

Species Background Information

The Western Pebble-mound Mouse is a rodent with light brown fur, fawn sides and a darker head. The species weighs approximately 10 g (Hamersley Iron, 2023). The species is listed as Priority 4 under the BC Act.

Abundance and Distribution

The species was previously thought to have been limited to a small section of the Central Pilbara; however, it has since been confirmed to be present from the Chichester Range in the north-west to the Rudall River in the east (Hamersley Iron, 2023).

Habitat Preferences

The Western Pebble-mound Mouse primarily inhabits areas with shallow soils or exposed bedrock. Its preferred vegetation consists of hummock grasslands dominated by *Triodia* grasses, along with various shrubs, particularly *Acacia* and *Senna* species (Lee, 1995; Menkhorst & Knight, 2010). This species constructs distinctive pebble mounds using small stones, which are limited to specific stone types and are typically located on gentle slopes and spurs vegetated with hard spinifex. It can also be found on ridge tops and flatter lower areas, where scattered shrubs and occasional eucalypts are present (Hamersley Iron, 2023).

Home range estimates vary between sexes, with males occupying an average range of 14.4 ha (+/- 6.7 ha) and females covering 4.6 ha (+/- 2.7 ha). Core home areas are smaller, averaging 0.93 ha (+/- 0.29 ha) for males and 0.29 ha (+/- 0.16 ha) for females (Anstee *et al*., 1997).

Known Populations in the Vicinity of the DE and Broader Region

According to the DBCA database, there are 76 records within 40 km of the DE, recorded between 1993 and 2021. The closest DBCA record is approximately 1 km west of the DE and was recorded in 2005.

Secondary evidence (mounds) of the Western Pebble-mound Mouse was recorded during the recent surveys. This included mounds at 10 sites within the DE within the rocky escarpment (ridges/mesa/cliffs/outcrops/breakaways) and plain (stony/gibber) habitat types (ecologia, 2025b).

Species Habitat Extent, Quality and Importance

Habitat critical to the survival of the Western Pebble-mound Mouse is not defined. However, the plain (stony/gibber), hills/ranges/plateaux and rocky escarpments (ridges/mesa/cliffs/ outcrops/breakaways) habitats are likely to be used by the species for mound construction, foraging and dispersal (ecologia, 2025b) and are considered supporting habitat. These habitats were reported to range from 'Good' to 'Excellent' condition (ecologia, 2025b).

This species is considered relatively widespread throughout the Pilbara, with suitable habitat for this species extending well beyond the confines of the DE (ecologia, 2025b).

The extent of potential Western Pebble-mound Mouse habitat present in the DE is shown in Table 8-16.

Table 8-16: Western Pebble-mound Mouse Habitat Types in the Development Envelope

Habitat type	Habitat importance	Extent in DE (ha)
Rocky escarpments (ridges/mesa/cliffs/outcrops/breakaways)	Supporting habitat (mounds, foraging and dispersal)	2,123.25
Hills/ranges/plateaux	Supporting habitat (mounds, foraging and dispersal)	1,322.34
Plain (stony/gibber)	Supporting habitat (mounds, foraging and dispersal)	75,547.94

Long-tailed Dunnart (*Antechinomys longicaudata*) – High Likelihood

Species Background Information

The Long-tailed Dunnart is a small, carnivorous marsupial with a characteristically long tail, more than twice the length of its body (Burbidge, McKenzie & Fuller, 2008). The species is well adapted to climbing, as indicated by its long, muscular tail, striated foot pads and behavioural observations made in captivity (Burbidge *et al.,* 2008). The Long-tailed Dunnart feeds on arthropods such as beetles, ants, cockroaches, centipedes, grasshoppers and larvae. This species is listed as Priority 4 under the BC Act.

Abundance and Distribution

The Long-tailed Dunnart is rarely encountered but is thought to occur in low population densities across the Pilbara, Murchison, north-eastern Goldfields, Ashburton and Gibson Desert regions (ecologia, 2025b).

Habitat Preferences

The Long-tailed Dunnart is predominantly found in rugged, rocky country in the Western arid zone and sometimes open country with a gravel/stony mantle (Burbidge *et al.,* 2008). The species' habitat includes *Acacia*, rocky screes with hummock grass and shrubs, and tall open shrubland and woodlands (Burbidge *et al.,* 2008).

Known Populations in the Vicinity of the DE and Broader Region

According to the DBCA database, there are two records within 40 km of the DE. One record is from 2011 and is approximately 35 km north-east of the DE. The other record is from 2005 and is 1.5 km west of the DE.

This species was not recorded during recent surveys (ecologia, 2025b).

Species Habitat Extent, Quality and Importance

Habitat critical to the survival of the Long-tailed Dunnart is not defined. Due to the highly cryptic nature of the species, despite not being recorded during surveys (ecologia, 2025b) it is still considered to have a high likelihood of occurrence in the DE. If the species should be present in the DE, it would utilise the rocky escarpments (ridges/mesa/cliffs/outcrops/breakaways), gorges/gullies, granite outcrops (flat dome) and hills/ranges/plateaux habitats for supporting habitat (shelter, foraging and dispersal). These habitats were reported as 'Excellent' condition (ecologia, 2025b).

The extent of potential Long-tailed Dunnart habitat present in the DE is shown in Table 8-17.

Table 8-17: Long-tailed Dunnart Habitat Types in the Development Envelope

Habitat type	Habitat importance	Extent in DE (ha)
Rocky escarpments (ridges/mesa/cliffs/outcrops/breakaways)	Supporting habitat (shelter, foraging, dispersal)	2,123.25
Gorges/gullies	Supporting habitat (shelter, foraging, dispersal)	41.51
Granite outcrops (flat dome)	Supporting habitat (shelter, foraging, dispersal)	12.48
Hills/ranges/plateaux	Supporting habitat (shelter, foraging, dispersal)	1,322.34

8.4.5 Migratory Species

Migratory species are protected under the BC Act and/or EPBC Act. Migratory species are also protected under the following international agreements:

- Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention),
- China–Australia Migratory Bird Agreement (CAMBA),
- Japan–Australia Migratory Bird Agreement (JAMBA), and
- Republic of Korea–Australia Migratory Bird Agreement (ROKAMBA).

Two Migratory species have been recorded during the ecological (2026) surveys: the Fork-tailed Swift and the Oriental Plover. No other Migratory species were recorded within the DE during the field surveys. However, the following species have been recorded within a 40 km buffer of the DE. These species are expected to intermittently occur within the DE (overflying or temporary utilisation of aquatic habitat) when migrating to the Fortescue Marsh (ecologia, 2025b).

The Fortescue Marsh is located approximately 9.3 km south-east of the DE (25 km from nearest wind turbine) and is an extensive ephemeral wetland that occupies an area of 1,000 km^2 when flooded. This marsh is nominated as a Ramsar site and is listed on the Directory of Important Wetlands, due to supporting several hundred waterbird species during flood seasons (State of WA, 2018).

All species discussed in the following section have a 'Moderate' likelihood of occurrence in the DE. Information about each species, including species presence, is discussed in the context of potential habitat extents within the DE.

Fork-tailed Swift (*Apus pacificus*) - Recorded

Species Background Information

The Fork-tailed Swift is a medium to large swift with a length of 18-21 cm, a wingspan of 40-42 cm and weighing approximately 30-40 g with a characteristically long forked tail (DoE, 2025c). The Fork-tailed Swift is listed as Migratory under the BC Act and the EPBC Act. The species is also listed under CAMBA, JAMBA and ROKAMBA.

Abundance and Distribution

The global population of the species has not been quantified and there is no measure of abundance in Australia (DoE, 2025c). Populations throughout most the range of the Fork-tailed Swift is considered to be stable, except in Pakistan (del Hoyo *et al*., 1996). The species is listed as a 'Species of Least Concern' on IUCN Red List of Threatened Species.

The Fork-tailed Swift arrives in WA from October to November and departs around April. The species is most common in Broome, where maximum numbers occur in February (DoE, 2025c). While in WA, the species occurs primarily along coastal and subcoastal areas between Augusta and Carnarvon with sparse inland records of the Fork-tailed Swift (DoE, 2025c).

Habitat Preferences

The Fork-tailed swift occurs primarily over inland plains and sometimes above foothills or in coastal areas, the species often occurs over cliffs and beaches as well as over islands and well out to sea (DoE, 2025c). The species is predominantly aerial, flying from 1-300 m above ground. The Fork-tailed Swift occurs in a variety of different habitats, from above rainforests to semi-deserts. In Australia the species mostly occurs over dry or open habitats including riparian woodland and tea-tree swamps, low scrub, heathland or saltmarsh (Higgins, 1999). The Fork-tailed Swift doesn't breed in Australia (DoE, 2025c).

Threats

While there are no significant threats to the Fork-tailed Swift in Australia, potential threats include habitat destruction and predation by feral animals (DoE, 2025c).

Known Populations in the Vicinity of the DE and Broader Region

According to DBCA databases, there is a single record of the Fork-Tailed Swift within 40 km of the DE from 2013. This record is approximately 27 km south of the DE.

This species was recorded on four occasions during the wet season survey conducted in February 2025 (ecologia, 2026).

Species Habitat Extent, Quality and Importance

There is no Conservation Advice, Listing Advice nor Recovery Plan for this species, and therefore critical habitat is not defined. Due to sparse records, suitable habitat present at the

Fortescue Marsh (9.3 km from the DE), this species is likely to only overfly the DE intermittently. Although the Fork-tailed Swift has the potential to occur in the airspace above the DE, it is not reliant on the habitats within the DE (ecologia, 2025b).

Oriental Plover (*Charadrius veredus*) – Recorded

Species Background Information

The Oriental Plover is a medium plover with an average length of 21-25 cm (DoE, 2025d). Both male and female members of the species have a similar non-breeding plumage with a brown crown and nape, pale brown hindneck and brown upperparts. In breeding plumage, the female Oriental Plover looks similar to non-breeding plumage while the males have whiteish head and neck with a dark brown patch at the back of the crown (Hayman *et al*., 1986; Marchant & Higgins, 1993). The Oriental Plover is listed as Migratory under the BC Act and EPBC Act. The species is also listed under CAMBA, JAMBA and ROKAMBA.

Abundance and Distribution

While the Oriental Plover does not breed in Australia, the global population of the species spends the non-breeding season in northern Australia, in both coastal and inland areas (Bishop, 2006; Stewart *et al.,* 2007). The species arrives in Australia from early to mid-September in the north-western region and occurs between Exmouth Gulf and Derby in WA. The species has also been known to occur further inland in Northern WA, the Northern Territory and north-western Queensland (DoE, 2025d).

Habitat Preferences

The Oriental Plover is found within inland wetlands and sheltered coastal areas; it uses both permanent and ephemeral wetlands (ecologia, 2025b). The species forages among short grass, on hard stony bare ground, mudflats or among seaweed on beaches. Oriental Plovers roost on soft wet mud, shallow water of beaches and tidal mudflats and dry, open habitats, such as saltmarsh or paddocks (DoE, 2025d).

Within Australia, after arriving in non-breeding grounds in northern Australia, the Oriental Plover spends a few weeks in coastal habitats before travelling further inland (DoE, 2025d). In inland Australia, the species can be found in flat, open, semi-arid or arid grasslands areas with short and sparse grass. In the wet season, the Oriental Plovers can be found in lightly wooded grasslands or estuarine and littoral environments (DoE, 2025d).

Threats

Threats to the Oriental Plover include disturbance from human recreation, modification or destruction of habitat, aircraft strike at airports and vehicle strike (DoE, 2025d).

Known Populations in the Vicinity of the DE and Broader Region

According to the DBCA database, there are three records within 40 km of the DE. These records are from 2017, approximately 14 km north of the DE.

This species was recorded on a single occasion during the southward migration in September 2024 (ecologia, 2026).

Species Habitat Extent, Quality and Importance

Habitat critical to the survival of the species is not defined. The Oriental Plover may use all habitats within the DE as dispersal and foraging habitat. The extent of potential Oriental Plover habitat present in the DE is shown in Table 8-18.

Table 8-18: Oriental Plover Habitat Types in the Development Envelope

Habitat type	Habitat importance	Extent in DE (ha)
All habitats	Supporting habitat (dispersal and foraging)	89,129.29

The other habitats within the DE which provide suitable foraging habitat include:

- 1,657.22 ha of drainage Line/River/Creek (major),
- 2,092.13 ha of drainage line/river/creek (minor),
- 12.48 ha of granite outcrops (flat dome),
- 41.51 ha gorges/gullies,
- 1,322.34 ha of hills/ranges/plateaux,
- 5,366.12 ha of plain (cracking clays),
- 75,547.94 ha of plain (stony/gibber),
- 2,123.25 ha of rocky escarpments (ridges/mesa/cliffs/outcrops/breakaways),
- 392.02 ha of woodland (closed), and
- 574.28 ha of woodland (open).

The Oriental Plover may use the drainage line/river/creek (major) habitat for dispersal and foraging. This habitat was reported as ranging from 'Degraded' to 'Good' condition (ecologia, 2025b). The remaining habitats are in 'Poor' to 'Excellent' condition (ecologia, 2025b).

This species is not expected to rely on any habitats within the DE and occur intermittently during migratory movement to the Fortescue Marsh.

Common Greenshank (*Tringa nebularia*) – Moderate Likelihood

Species Background Information

The Common Greenshank is a large, carnivorous wader, measuring approximately 30-35 cm in length with a wingspan of 55-65 cm (DCCEEW, 2024). The species is characterised by their long, slightly upturned bill. Although there is no visual difference between the male and female birds, there is some seasonal variation in plumage and juveniles are differentiated from adults. The Common Greenshank is listed as Endangered and Migratory under the EPBC Act and Migratory under the BC Act. The species is also listed under the following international Migratory bird agreements: CAMBA, JAMBA and ROKAMBA.

Abundance and Distribution

The global distribution of the species is widespread, it is found in Europe, Africa, Asia, Melanesia and Australasia (DCCEEW, 2024). Despite this widespread distribution, the Common Greenshank population is in decline. It is currently estimated that there are approximately 23,700 mature individuals in the wild (DCCEEW, 2024). In Australia, the species' distribution is predominantly spread across coastal regions, and they are found in all types of wetlands (Higgins & Davies, 1996). The species is present in WA, predominantly in coastal areas from Cape Arid to Carnarvon. In the Kimberley region, the Common Greenshank has been recorded primarily in the south-west and northeast (Higgins & Davies, 1996).

Habitat Preferences

The species forages on the edge of wetlands, in soft mud on mudflats, in channels or around the shallow edge of waterbodies. The species roosts on the coast and inland in estuaries and mudflats, mangrove swamps and lagoons, and in billabongs, swamps, sewage farms, and flooded crops (BirdLife Australia, 2021).

The Common Greenshank is found in shallow, fresh waters such as claypans, swamps, river pools as well as salt waters such as estuaries, samphire flats, reef flats (ecologia, 2025b). The Common Greenshank does not breed in Australia (DCCEEW, 2024).

Threats

The Common Greenshank Conservation Advice (DCCEEW, 2024) identifies that the threats to the species are habitat loss, downstream effects of large dams, disturbance at feeding and roosting sites, sea level rise, invasive species, hunting, fishing bycatch and pollution.

Known Populations in the Vicinity of the DE and Broader Region

According to the DBCA database, there were four records between 2009 to 2018 that were approximately 14 km from the DE. There are no DBCA records of this species within the DE and the species was not recorded in the recent surveys (ecologia, 2025b; ecologia, 2026).

Species Habitat Extent, Quality and Importance

Critical habitat for the species is reported as a mosaic of feeding and roosting habitat (TSSC, 2024). The species is likely to overfly or intermittently use habitat within the DE. If the species were to be present within the DE, the species is likely to be associated with migratory movement to the Fortescue Marsh (9.3 km south-west from the DE) and would not represent permanent occupancy (ecologia, 2025b).

Within the DE, the species may use the drainage lines/rivers/creeks (major) for dispersal and foraging. This habitat is therefore not considered habitat critical to the survival of the species. This habitat condition was reported as 'Degraded' to 'Good' (ecologia, 2025b). The extent of potential Common Greenshank habitat present in the DE is shown in Table 8-19.

Table 8-19: Common Greenshank Habitat Types in the Development Envelope

Habitat type	Habitat importance	Extent in DE (ha)
Drainage lines/rivers/creeks (major)	Supporting (dispersal and foraging)	1,657.22

Sharp-tailed Sandpiper (*Calidris acuminata*) – Moderate Likelihood

Species Background Information

The Sharp-tailed Sandpiper is a small sandpiper, measuring approximately 17-22 cm long with a 36 – 43 cm wingspan. The species is identified by their pot-belly, extended rear, short neck and small, flat head. There is little variation between the two sexes but a marked seasonal plumage variation and distinction between juveniles and adults (DCCEEW, 2024a). The Sharp-tailed Sandpiper is listed as Vulnerable under the EPBC Act and Migratory under the BC Act and EPBC Act. The species is also listed under Bonn, CAMBA, JAMBA and ROKAMBA.

Abundance and Distribution

The species is listed as Vulnerable on the International Union for Conservation of Nature (IUCN) Red List of Threatened Species, with an estimated 71,000 mature individuals in the wild (Clemens *et al.,* 2021).

The Sharp-tailed Sandpiper is present within all Australian states during the non-breeding season (DCCEEW, 2024a). The species occurs in a range of freshwater and saline habitats, in both inland and coastal locations (Higgins & Davies, 1996). In WA, the Sharp-tailed Sandpiper occurs from Cape Arid to Carnarvon, around coastal and sub-coastal plains of the Pilbara Region, through to the Kimberley Division. There are scattered records along the Nullabor Plain and southern areas of the Great Victoria Desert (Higgins & Davies, 1996).

Habitat Preferences

The species is predominantly found within the muddy edges of shallow wetlands with inundated or emergent sedges, grass, saltmarsh or other low vegetation (Pizzey & Knight, 2013). Their foraging habitats vary from fresh to hypersaline, the species mostly feeds along the edge of water on mudflats, coastal and inland wetlands and sewage ponds (Higgins & Davies, 1996). The Sharp-tailed Sandpiper roosts on rocky and sandy beaches, freshwater habitats, and inland saltwater habitats (Higgins & Davies 1996).

The Sharp-tailed Sandpiper does not breed in Australia (DCCEEW, 2024a).

Threats

The Conservation Advice for the Sharp-tailed Sandpiper identifies threats to the species such as habitat loss, degradation, fragmentation, climate change, invasive species, pollution and exploitation (DCCEEW, 2024a).

Known Populations in the Vicinity of the DE and Broader Region

According to the DBCA database, there are three records within 40 km of the DE. The records range from 2007 to 2010, with the closest record approximately 11 km north-east of the DE.

This species was not recorded during recent surveys (ecologia, 2025b; ecologia, 2026).

Species Habitat Extent, Quality and Importance

The Conservation Advice for the Sharp-tailed Sandpiper (DCCEEW, 2024) defines habitat critical to the survival as areas that are necessary:

- *For activities such as foraging, breeding roosting or dispersal,*
- *For the long-term maintenance of the species (including maintenance of species essential to the survival of the sharp-tailed sandpiper),*
- *To maintain genetic diversity and long-term evolutionary development, or*
- *For the re-introduction of populations or recovery of the species.*

The species is unlikely to permanently occupy the DE and is more likely to be present intermittently associated with migratory movement (ecologia, 2025b). However, the species may use drainage lines/rivers/creeks (major) for dispersal and foraging activities. The extent of potential Sharp-tailed Sandpiper habitat present in the DE is shown in Table 8-20.

Table 8-20: Sharp-tailed Sandpiper Habitat Types in the Development Envelope

Habitat type	Habitat importance	Extent in DE (ha)
Drainage lines/rivers/creeks (major)	Supporting habitat (dispersal and foraging)	1,657.22

The Sharp-tailed Sandpiper may use the drainage line/river/creek (major) habitat for dispersal and foraging. This habitat was reported to range from 'Degraded' to 'Good' condition (ecologia, 2025b).

This species is not expected to rely on any habitats within the DE and likely occurs intermittently during migratory movement to the Fortescue Marsh.

Common Sandpiper (*Actitis hypoleucos*) – Moderate Likelihood

Species Background Information

The Common Sandpiper is a small sandpiper, approximately 19-21 cm in length and a wingspan of approximately 32-35 cm (DoE, 2025b). The species has a dark brown body with greenish glossy feathers of cap, hind neck and mantle. The Common Sandpiper is listed as Migratory under the EPBC Act and the BC Act.

Abundance and Distribution

The population of the Common Sandpiper is estimated to be between 2.5 to 4 million (Bamford *et al.,* 2008). During the non-breeding season, approximately 3,000 individuals arrive in Australia from July onwards (Greering *et al*., 2007). The Common Sandpiper has a widespread distribution, occurring along the entire Australian coastline as well as inland areas, however, they are most common in northern and WA (Higgins & Davies, 1996). Nuytsland Nature Reserve and Roebuck Bay are areas of national importance for the species in WA. The population of the Common Sandpiper is listed as a species of least concern on the IUCN Red List of Threatened Species.

Habitat Preferences

The Common Sandpiper utilises both coastal and inland habitats. The species is present within inland wetlands and sheltered coastal areas and utilises both permanent and ephemeral wetlands (ecologia, 2025b*).* The Common Sandpiper is a Migratory species that has been recorded in estuaries and deltas of streams, as well as on banks farther upstream; around lakes, pools, billabongs, reservoirs, dams and claypans, and occasionally piers and jetties

(DoE, 2025b). The species typically roosts on rocks or roots of branches of vegetation, particularly mangroves (Higgins & Davies, 1996). This species does not breed in Australia (DoE, 2025b).

Threats

The primary threat to the Common Sandpiper is human activity and associated disturbance such as habitat changes, regulation of rivers, pollution and the use of pesticides. Other threats include habitat loss, the reduction of quality and quantity of water and global warming (DoE, 2025b).

Known Populations in the Vicinity of the DE and Broader Region

According to the DBCA database, there is one record within 40 km of the DE. This record is from 2018 and is approximately 30 km from the DE.

This species was not recorded during recent surveys (ecologia, 2025b; ecologia, 2026).

Species Habitat Extent, Quality and Importance

Habitat critical to the survival of the Common Sandpiper is not defined. Within the DE, the species may use the drainage line/river/creek (major) habitat for dispersal and foraging. The extent of potential Common Sandpiper habitat present in the DE is shown in Table 8-21.

Table 8-21: Common Sandpiper Habitat Types in the Development Envelope

Habitat type	Habitat importance	Extent in DE (ha)
Drainage line/river/creek (major)	Supporting habitat (dispersal and foraging)	1,657.22

The Common Sandpiper may use the drainage line/river/creek (major) habitat for dispersal and foraging. This habitat was reported to range from 'Degraded' to 'Good' habitat condition (ecologia, 2025b).

This species is not expected to rely on any habitats within the DE and likely occurs intermittently during migratory movement to the Fortescue Marsh.

Red-necked Stint (*Calidris ruficollus*) - Moderate Likelihood

Species Background Information

The Red-necked Stint is the smallest shorebird in Australia, measuring approximately 13-16 cm in length (Geering *et al*., 2017). The species has a small head, round forehead and a long body and short legs. The species' plumage varies depending on a variety of factors such as age, sex and season (Higgins & Davies, 1996). The Red-necked Stint is listed as Migratory under the EPBC Act and BC Act.

Abundance and Distribution

The Red-necked Stint occurs in large densities on the Victorian and Tasmanian coasts but is distributed along most of the Australian coastline, with records from all coastal regions as well as some inland records when conditions are suitable. The species travels and feeds in dense flocks (DoE, 2015). The species breeds near Siberia and western Alaska, moving to non-breeding areas in South-east Asia and Australia during winter months (BirdLife Australia,

2023). The species arrives in Australia from August to September and travels from north-west Australia to south-west Australia before crossing the continent towards the south, south-east and east coasts (Higgins & Davies, 1996). The Red-necked Stint has an estimated population of 353,000 in Australia (Watkins, 1993).

Habitat Preferences

Within Australia, the Red-necked Stint predominantly occurs in coastal areas such as sheltered inlets, bays, lagoons and estuaries. The species has been occasionally recorded on dry gibber plains with little to no perennial vegetation (Higgins & Davies, 1996).

The species usually forages on bare wet mud on intertidal mudflats or sandflats or in very shallow water (DoE, 2015). The Red-necked Stint mostly roosts on sheltered beaches, spits, banks or inlets of sand, mud, coral or shingle and occasionally on exposed reefs or shoals (Higgins & Davies, 1996).

Threats

The main threat to the species globally is direct and indirect habitat loss (Melville, 1997). According to the Species Profile and Threats Database (DoE, 2015), the threats to the Red-necked Stint within Australia include habitat loss and degradation, disturbance from residential and recreational activities and direct mortality.

Known Populations in the Vicinity of the DE and Broader Region

According to the DBCA database, there are three records within 40 km of the DE. These records are from 2017 and are located approximately 30 km north of the DE.

This species was not recorded during recent surveys (ecologia, 2025b; ecologia, 2026).

Species Habitat Extent, Quality and Importance

Habitat critical to the survival of the Red-necked Stint is not defined. Within the DE, the species may use the drainage line/river/creek (major) habitat for dispersal and foraging. The extent of potential Red-necked Stint habitat present in the DE is shown in Table 8-22.

Table 8-22: Red-necked Stint Habitat Types in the Development Envelope

Habitat type	Habitat importance	Extent in DE (ha)
Drainage line/river/creek (major)	Supporting habitat (foraging and dispersal)	1,657.22

The Red-necked Stint may use the drainage line/river/creek (major) habitat for dispersal and foraging. This habitat was reported to range from ‘Degraded’ to ‘Good’ habitat condition (ecologia, 2025b).

This species is not expected to rely on any habitats within the DE and occurs intermittently during migratory movement to the Fortescue Marsh.

Gull-billed Tern (*Gelochelidon nilotica*) – Moderate Likelihood

Species Background Information

The Gull-billed Tern is a large tern with a characteristic short, thick gull-like bill, heavy rounded head and short thick neck (DAWE, 2020). The species was previously grouped with the Australian Gull-billed Tern (*G. macrotarsa*) in the genus Sterna, however, has since been taxonomically split (DAWE, 2020). The species is listed as Migratory under the EPBC Act and BC Act.

Abundance and Distribution

The Gull-billed Tern has an estimated extent of occurrence of 163,000,000 km^2 with a decreasing trend (BirdLife International, 2019). Australian population estimate and trends are not known (DAWE, 2020). The species breeds at scattered sites within North and South America, Europe, Africa and Asia. The global population of the Gull-billed Tern has not been estimated separately however, the estimated combined population of the Gull-billed Tern and Australian Gull-billed Tern is between 150,000 to 420,000 individuals (Delany & Scott, 2006).

Habitat Preferences

The species breeds in various locations with bare, sparsely vegetation islands, banks, flats or spits of dry mud and sand, dunes, saltmarshes, saltpans, freshwater lagoons, estuaries, deltas, inland lakes, rivers, marshes and swamps (del Hoyo *et al.,* 1996, Higgins and Davies 1996). The Gull-billed Tern typically forages over saltpans, coastal lagoons, mudflats, marshes and wet fields (DAWE, 2020).

Threats

The primary threat to the Gull-billed Tern is human intrusion and disturbance from both recreational activities as well as egging and hunting in some areas of its range (Molina *et al.,* 2014).

Known Populations in the Vicinity of the DE and Broader Region

According to the DBCA database, there are nine records within 40 km of the DE. These records are from 2007 to 2017. The closest record is approximately 9 km north-east of the DE and is from 2014.

This species was not recorded during recent surveys (ecologia, 2025b; ecologia, 2026).

Species Habitat Extent, Quality and Importance

Critical habitat is not listed for this species. Within the DE, the species may use the drainage line/river/creek (major) habitat for dispersal and foraging. The extent of potential Gull-billed Tern habitat present in the DE is shown in Table 8-23.

Table 8-23: Gull-billed Tern Habitat Types in the Development Envelope

Habitat type	Habitat importance	Extent in DE (ha)
Drainage lines/rivers/creeks (major)	Supporting habitat (dispersal and foraging)	1,657.22

The Gull-billed Tern may use the drainage line/river/creek (major) habitat for dispersal and foraging. This habitat was reported to range from 'Degraded' to 'Good' habitat condition (ecologia, 2025b).

This species is not expected to rely on any habitats within the DE and occur intermittently during migratory movement to the Fortescue Marsh.

Caspian Tern (*Hydroprogne caspia*) - Moderate Likelihood

Species Background Information

The Caspian Tern is the largest tern in Australia with long, backswept wings, a slightly forked tail and a red bill (DoE, 2025e). The species has a white body with black and white streaked crown, dark brown eyes and black legs (Higgins & Davis, 1996). There is little difference between the two sexes with an average body length of 53-60 cm and an average weight of 680 g (Higgins & Davis, 1996). The species is listed as Migratory under the EPBC Act and the BC Act.

Abundance and Distribution

The species has a scattered global distribution with an estimated extent of occurrence of 226,290,000 km^2 with an increasing trend (Birdlife International, 2018). The Caspian Tern has a widespread occurrence within Australia, found in both coastal and inland locations across all states and territories. In WA, the species is primarily found coastally in the region from the Great Australian Bight to the Dampier Peninsula (Higgins & Davies, 1996). The total population for the Caspian tern is estimated to be between 240,000 and 420,000 (BirdLife International, 2010).

Habitat Preferences

The Caspian Tern can be found in a variety of coastal and inland habitats, the species prefers sheltered seas and inlands watercourses (estuaries, tidal creeks, near-coastal salt lakes) and brackish pools in the lower courses of rivers (ecologia, 2025b).

Threats

According to the Species Profile and Threats Database (DoE, 2025e), the threats to the Caspian Tern are habitat loss or degradation through the introduction of exotic species, predation of chicks by Silver Gulls, human disturbance and trampling by cattle, entanglement with fishing line, exposure to and bioaccumulation of contaminants and sea level rise.

Known Populations in the Vicinity of the DE and Broader Region

According to the DBCA database, there is one record within 40 km of the DE. This record is from 2007 and is approximately 24 km south-east of the DE.

This species was not recorded during recent surveys (ecologia, 2025b; ecologia, 2026).

Species Habitat Extent, Quality and Importance

Critical habitat is not defined for this species. Within the DE, the species may use the drainage line/river/creek (major) habitat for dispersal and foraging. This habitat was reported to range from 'Degraded' to 'Good' condition (ecologia, 2025b).

This species is not expected to rely on any habitats within the DE and occurs intermittently during migratory movement to the Fortescue Marsh.

The extent of potential Caspian Tern habitat present in the DE is shown in Table 8-24.

Table 8-24: Caspian Tern Habitat Types in the Development Envelope

Habitat type	Habitat importance	Extent in DE (ha)
Drainage lines/rivers/creeks (major)	Supporting habitat (dispersal and foraging)	1,657.22

Glossy Ibis (*Plegadis falcinellus*) - Moderate Likelihood

Species Background Information

The Glossy Ibis is the smallest Ibis species found in Australia. It has a reddish-brown neck, a bronze-brown body, and wings with a metallic iridescent sheen. A distinguishing feature is its long, downward-curved bill, which is olive-brown in colour. The facial skin is blue-grey, with a white outline around the eyes. Males and females have similar plumage, though males are generally larger. The species has an average length of 55–65 cm and a wingspan of 80–95 cm (Hancock *et al*., 1992).

Abundance and Distribution

Globally, the Glossy Ibis is widely distributed, occurring in eastern North America, the Caribbean, Europe, Russia, Siberia, Central Asia, sub-Saharan Africa, Pakistan, India, the Philippines, Indonesia, Papua New Guinea, and Australia (Beehler *et al*., 1986; Coates & Bishop, 1997; Marchant & Higgins, 1990). In Australia, the species is typically found east of the Kimberley in WA and the Eyre Peninsula in South Australia, with patchy distribution across other parts of WA. It is considered rare or a vagrant in Tasmania (Beehler *et al*., 1986; Coates & Bishop, 1997; Marchant & Higgins, 1990). The global population of the Glossy Ibis is estimated to be between 1,200,000 and 3,200,000 worldwide (BirdLife International, 2010).

Habitat Preferences

The Glossy Ibis prefers freshwater wetlands for both foraging and breeding. It is commonly found in marshes at the edges of lakes and rivers, lagoons, floodplains, wet meadows, swamps, reservoirs, sewage ponds, rice fields, and other irrigated agricultural areas. It can also occasionally be seen in coastal environments such as estuaries, deltas, saltmarshes, and coastal lagoons (del Hoyo *et al*., 1992; Hancock *et al*., 1992; Marchant & Higgins, 1990).

Within Australia, its prime habitat includes inland and northern floodplains, with the highest concentrations occurring in drying Top End grass and sedge swamps, as well as Channel Country grass and forb meadows. It is sometimes observed in wooded swamps, artificial wetlands (such as irrigated fields), and mangroves, where it may also breed (Chatto, 2000; Marchant & Higgins, 1990). During droughts, the species may retreat to permanent wetlands or coastal areas, including tidal wetlands (Marchant & Higgins, 1990). Glossy Ibises typically roost in trees or shrubs, usually near water bodies, though sometimes at more distant locations (Brown *et al*., 1982; Marchant & Higgins, 1990).

Threats

The primary threat to the Glossy Ibis is the destruction and degradation of wetland habitats. Water diversion, drainage, irrigation, and hydroelectric power production significantly impact the availability of suitable areas for foraging and breeding.

Known Populations in the Vicinity of the DE and Broader Region

According to the DBCA database, there are four records within 40 km of the DE. The records are from 2016 to 2017, with the closest record being approximately 24 km south-east of the DE in 2016.

This species was not recorded during recent surveys (ecologia, 2025b; ecologia, 2026).

Species Habitat Extent, Quality and Importance

Habitat critical to the survival of the Glossy Ibis is not defined. The species may use drainage lines/rivers/creeks (major) habitat type for foraging and dispersal. This habitat was reported to range from 'Degraded' to 'Good' habitat condition (ecologia, 2025b).

This species is not expected to rely on any habitats within the DE and occur intermittently during migratory movement to the Fortescue Marsh.

The extent of potential Glossy Ibis habitat present in the DE is shown in Table 8-25.

Table 8-25: Glossy Ibis Habitat Types in the Development Envelope

Habitat type	Habitat importance	Extent in DE (ha)
Drainage line/river/creek (major)	Supporting habitat (foraging and dispersal)	1,657.22

Wood Sandpiper (*Tringa glareola*) - Moderate Likelihood

Species Background Information

The Wood Sandpiper is a small, slender wading bird measuring 19–23 cm in length, with a wingspan of 56–57 cm and an average weight of 55 g (DoE, 2024d). It has a short, straight bill, long legs, and dark grey-brown or plain brown plumage (DoE, 2024d). The species is listed as Migratory under both the BC Act and EPBC Act and is also protected under international agreements, including CAMBA, JAMBA, and ROKAMBA.

Abundance and Distribution

The Wood Sandpiper is most abundant in northwestern Australia, though it has been recorded across various regions of WA. The global population is estimated to range between 3,055,000 - 4,320,000 individuals (Bamford *et al.*, 2008). It is classified as a species of Least Concern on the IUCN Red List of Threatened Species.

Habitat Preferences

The Wood Sandpiper does not breed in Australia (DoE, 2024d). It primarily inhabits well-vegetated, shallow freshwater wetlands, including swamps, billabongs, lakes, pools, and waterholes (DoE, 2024d). The species is commonly associated with aquatic plants and taller fringing vegetation, particularly *Melaleuca* and *Eucalyptus camaldulensis* (River Red Gums). It can also be found in inundated grasslands, short herbage, and wooded floodplains. Foraging typically occurs along the moist or dry mud edges of wetlands (Higgins & Davies, 1996). The Wood Sandpiper has been recorded roosting on low, grassy hillocks in flooded meadows, as well as on low branches of trees and fences (Higgins & Davies, 1996).

Threats

Key threats to the Wood Sandpiper include habitat loss, habitat degradation, human disturbance and direct mortality (DoE, 2024d).

Known Populations in the Vicinity of the DE and Broader Region

According to the DBCA database, there are six records within 40 km of the DE. The records range from 2007 to 2016, with the closest record approximately 12 km north-east from the DE recorded in 2010.

This species was not recorded during recent surveys (ecologia, 2025b, ecologia, 2026).

Species Habitat Extent, Quality and Importance

Critical habitat for the Wood Sandpiper is not defined. The species may use drainage lines/rivers/creeks (major) habitat type for dispersal and foraging. This habitat was reported to range from 'Degraded' to 'Good' condition (ecologia, 2025b).

This species is not expected to rely on any habitats within the DE and occur intermittently during migratory movement to the Fortescue Marsh.

The extent of potential Wood Sandpiper habitat present in the DE is shown in Table 8-26.

Table 8-26: Wood Sandpiper Habitat Types in the Development Envelope

Habitat type	Habitat importance	Extent in DE (ha)
Drainage line/river/creek (major)	Supporting habitat (dispersal and foraging)	1,657.22

Marsh Sandpiper (*Tringa stagnatilis*) - Moderate Likelihood

Species Background Information

The Marsh Sandpiper is a monotypic, medium-sized wader measuring 22–26 cm in length with a wingspan of 40–45 cm. In all plumages, the species is characterized by a contrasting outer wing, a very pale whitish tail, and a distinctive bold white wedge extending up the back (Higgins & Davies, 1996).

Abundance and Distribution

Marsh Sandpipers can be observed alone or in small to large flocks and often associate with other waders, particularly Greenshanks, especially in salt fields.

Globally, the species occurs throughout southern and northern Africa, Indonesia, Malaysia, New Guinea, the Philippines and western Micronesia. Additionally, the Marsh Sandpiper migrates through eastern China, Korea, and Japan. (Higgins & Davies, 1996).

In Australia, the species is found in coastal and inland wetlands across Australia and is particularly widespread along the coast of Queensland. In WA, it is predominantly recorded near the coast (Higgins & Davies, 1996). The Australian population is estimated to be around 9000 individuals (Watkins, 1993).

Habitat Preferences

The Marsh Sandpiper inhabits permanent and ephemeral wetlands of varying salinity, including swamps, lagoons, billabongs, saltpans, saltmarshes, estuaries, inundated floodplains, intertidal mudflats, sewage farms, and saltworks (ecologia, 2025b). The species

forages in shallow waters along the edges of wetlands and roosts and loafs on tidal mudflats, low saltmarsh, and inland swamps (Higgins & Davies, 1996).

Threats

Global threats to the Marsh Sandpiper include indirect and direct habitat loss (Melville, 1997). In Australia, threats include habitat loss and modification, anthropogenic disturbance, climate change and variability, harvesting of shorebird prey, fisheries bycatch and hunting (DoE, 2015).

Known Populations in the Vicinity of the DE and Broader Region

According to the DBCA database, there is one record within 40 km of the DE. This record is from 2016 and is approximately 14 km south-east of the DE.

This species was not recorded during recent surveys (ecologia, 2025b; ecologia, 2026).

Species Habitat Extent, Quality and Importance

Critical habitat for the Marsh Sandpiper is not defined. The species may use the drainage line/river/creek (major) habitat for dispersal and foraging. This habitat was reported to range from 'Degraded' to 'Good' habitat condition (ecologia, 2025b).

This species is not expected to rely on any habitats within the DE and occur intermittently during migratory movement to the Fortescue Marsh.

The extent of potential Marsh Sandpiper habitat present in the DE is shown in Table 8-27.

Table 8-27: Marsh Sandpiper Habitat Types in the Development Envelope

Habitat type	Habitat importance	Extent in DE (ha)
Drainage line/river/creek (major)	Supporting habitat (dispersal and foraging)	1,657.22

8.4.6 Short-Range Endemic Invertebrates

The SRE desktop review focussed on WA Museum records from a 40,000 km^2 area that was centred on the middle of the SRE Survey Area (as defined in Section 8.3.3). The desktop review identified a total of 19 species (six described) and 12 higher taxonomic ranks or species-complexes in the SRE target groups in the Study Area. These included one confirmed SRE, the flattie *Karaops feedtime* and eight potential SREs. Five of these potential SRE species are currently only known from the Study Area ('Study Area endemics)'.

The survey recorded a total of 73 species from SRE target groups. Of these, 12 are widespread species, 45 were potential SREs and one is a confirmed SRE, the keeled millipede *Antichiropus sloanae*. This species is listed as Priority 1 (P1) under WA conservation legislation. Forty species are currently only known from the Study Area ('Study Area endemics)'. SREs identified in the Survey Area (Figure 8-11) include:

- Opiliones (harvestmen; one taxon),
- Pseudoscorpions (pseudoscorpions; 15 taxa),
- Geophilomorpha (soil centipedes; six taxa),

- Scolopendromorpha (tropical centipedes; three taxa),
- Diplura (two-pronged bristletails, one taxon),
- Isopoda (slaters; 13 taxa), and
- Eupulmonata (land snails; one taxon).

One species collected in the DE, the Roy Hill *Antichiropus* Millipede (*Antichiropus sloanae*), is a DBCA Priority 1 listed species. This species has been recorded outside the Survey Area.

The high level of SREs not previously identified together with the low number of SRE and potential SRE species previously recorded within the Survey Area, suggests that the Survey Area has been poorly studied for SREs (HBI, 2024). Survey effort was considered appropriate for the purpose of a baseline survey (HBI, 2024).

The Survey Area was categorised into four habitat categories: (1) the grassland on plain in drainage line, (2) the woodland along rockface/gully, (3) the woodland in drainage line, and (4) the woodland on plain. The majority (51) of the 76 SRE or potential SRE taxa collected were recorded from a single habitat type, from woodland in drainage lines. However, survey effort was focused within this habitat. However, of the four principal habitat types identified during the field survey none have a significant role in the determination of SRE occurrence (HBI, 2024; ecologia 2025b).

HBI has completed an assessment of significance for the Survey Area compared to other Fortescue Projects. The assessment indicated that the size of the Survey Area as well topographical variation is likely to result in greater numbers of SREs compared to smaller survey areas or areas of less topographical complexity (HBI, 2024).

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Legend

- Development Envelope
- GOV Towns
- Major Roads
- Fortescue Rail
- Roy Hill Rail
- Turbine Locations
- Indicative Disturbance Footprint
- Approved Disturbance (Nullagine Pilot Wind Farm)
- SRE Records - Araneae and Opiliones

Fauna Habitats

- Cleared
- Drainage Line/River/ Creek (major)
- Drainage Line/River/ Creek (minor)
- Gorges/Gullies
- Granite Outcrops (flat dome)
- Hills/Ranges/Plateaux
- Plain (Cracking clays)
- Plain (stony/gibber)
- Rocky Escarpments (Ridges/Mesa/Cliffs/ Outcrops/Breakaways)
- Woodland (closed)
- Woodland (open)

Data Source(s):
Aerial, Fortescue and ESRI
All other data, Fortescue, 2025

N

0 2 4 6 8 10
Kilometers

Figure 8-11-1
Short-range Endemics (SRE) occurrences within the Development Envelope

Requested By: R. Dorji
Drawn By: R. Kerr
Revised By: rykerr
Approved By:
Scale: 1:300,000
Date: 1/29/2026
Size: A4L
Revision: 0
Confidentiality: 0
Coordinate System: GDA 1994 MGA Zone 50
Project Name: 4519OP002_MP_EN_0093_PartIV_2
Document Name: 4519OP002_MP_EN_0093_027a_r0_SRE_Habitats

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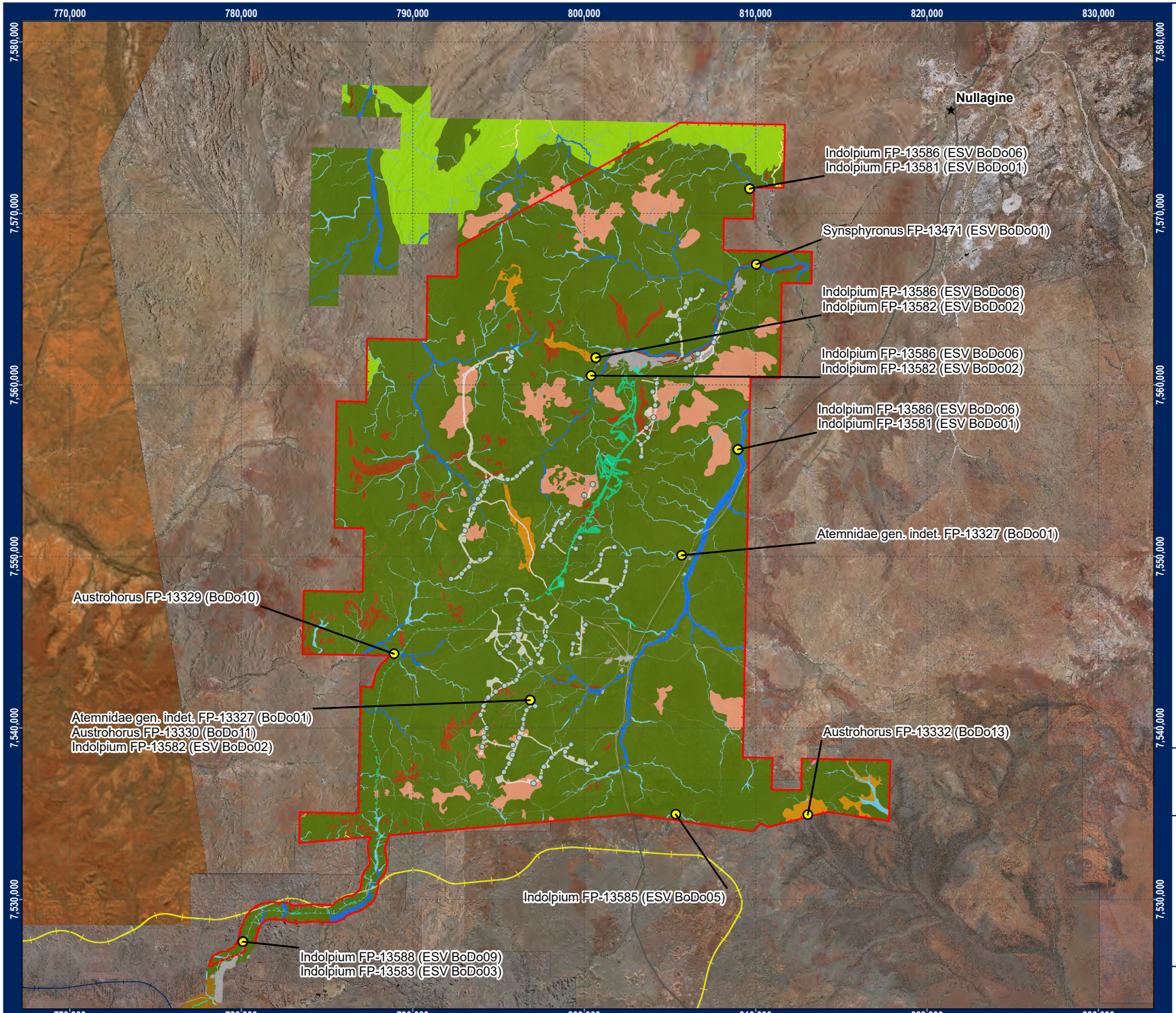

Legend

- Development Envelope
- GOV Towns
- Major Roads
- Fortescue Rail
- Roy Hill Rail
- Turbine Locations
- Indicative Disturbance Footprint
- Approved Disturbance (Nullagine Pilot Wind Farm)
- SRE Records - Pseudoscorpiones

Fauna Habitats

- Cleared
- Drainage Line/River/ Creek (major)
- Drainage Line/River/ Creek (minor)
- Gorges/Gullies
- Granite Outcrops (flat dome)
- Hills/Ranges/Plateaux
- Plain (Cracking clays)
- Plain (stony/gibber)
- Rocky Escarpments (Ridges/Mesa/Cliffs/ Outcrops/Breakaways)
- Woodland (closed)
- Woodland (open)

Data Source(s):
Aerial, Fortescue and ESRI
All other data, Fortescue, 2025

N

0 2 4 6 8 10
Kilometers

Figure 8-11-2
Short-range Endemics (SRE) occurrences within the Development Envelope

Requested By: R. Dorji	Date: 1/29/2026
Drawn By: R. Kerr	Size: A4L
Revised By: rykerr	Revision: 0
Approved By:	Confidentiality: 0
Scale: 1:300,000	
Coordinate System: GDA 1994 MGA Zone 50	
Project Name: 4519OP002_MP_EN_0093_PartIV_2	
Document Name: 4519OP002_MP_EN_0093_027b_r0_SRE_Habitats	

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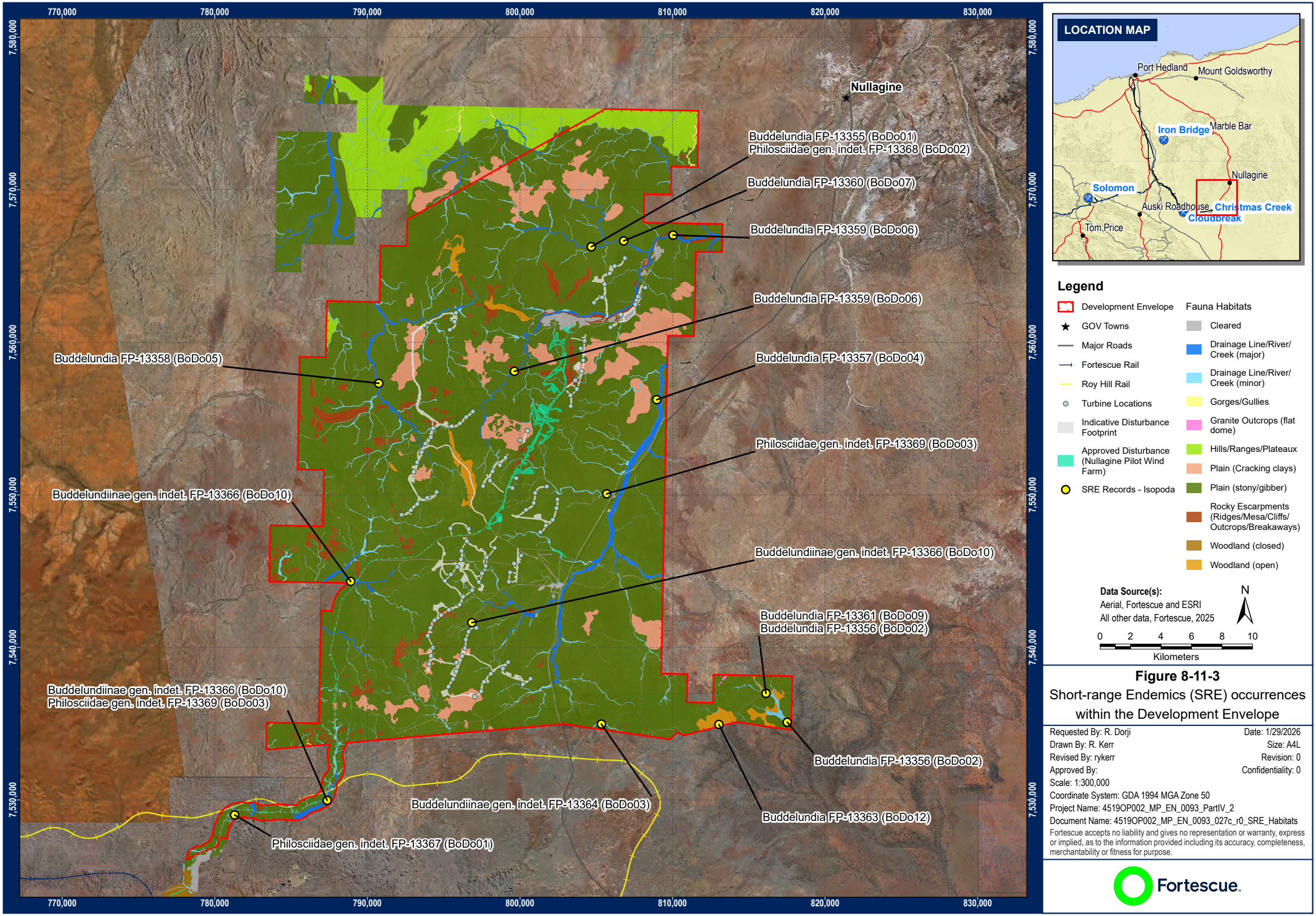

Legend

- Development Envelope
- GOV Towns
- Major Roads
- Fortescue Rail
- Roy Hill Rail
- Turbine Locations
- Indicative Disturbance Footprint
- Approved Disturbance (Nullagine Pilot Wind Farm)
- SRE Records - Isopoda

Fauna Habitats

- Cleared
- Drainage Line/River/ Creek (major)
- Drainage Line/River/ Creek (minor)
- Gorges/Gullies
- Granite Outcrops (flat dome)
- Hills/Ranges/Plateaux
- Plain (Cracking clays)
- Plain (stony/gibber)
- Rocky Escarpments (Ridges/Mesa/Cliffs/ Outcrops/Breakaways)
- Woodland (closed)
- Woodland (open)

Data Source(s):
Aerial, Fortescue and ESRI
All other data, Fortescue, 2025

N

0 2 4 6 8 10
Kilometers

Figure 8-11-3
Short-range Endemics (SRE) occurrences within the Development Envelope

Requested By: R. Dorji	Date: 1/29/2026
Drawn By: R. Kerr	Size: A4L
Revised By: rykerr	Revision: 0
Approved By:	Confidentiality: 0
Scale: 1:300,000	
Coordinate System: GDA 1994 MGA Zone 50	
Project Name: 4519OP002_MP_EN_0093_PartIV_2	
Document Name: 4519OP002_MP_EN_0093_027c_r0_SRE_Habitats	

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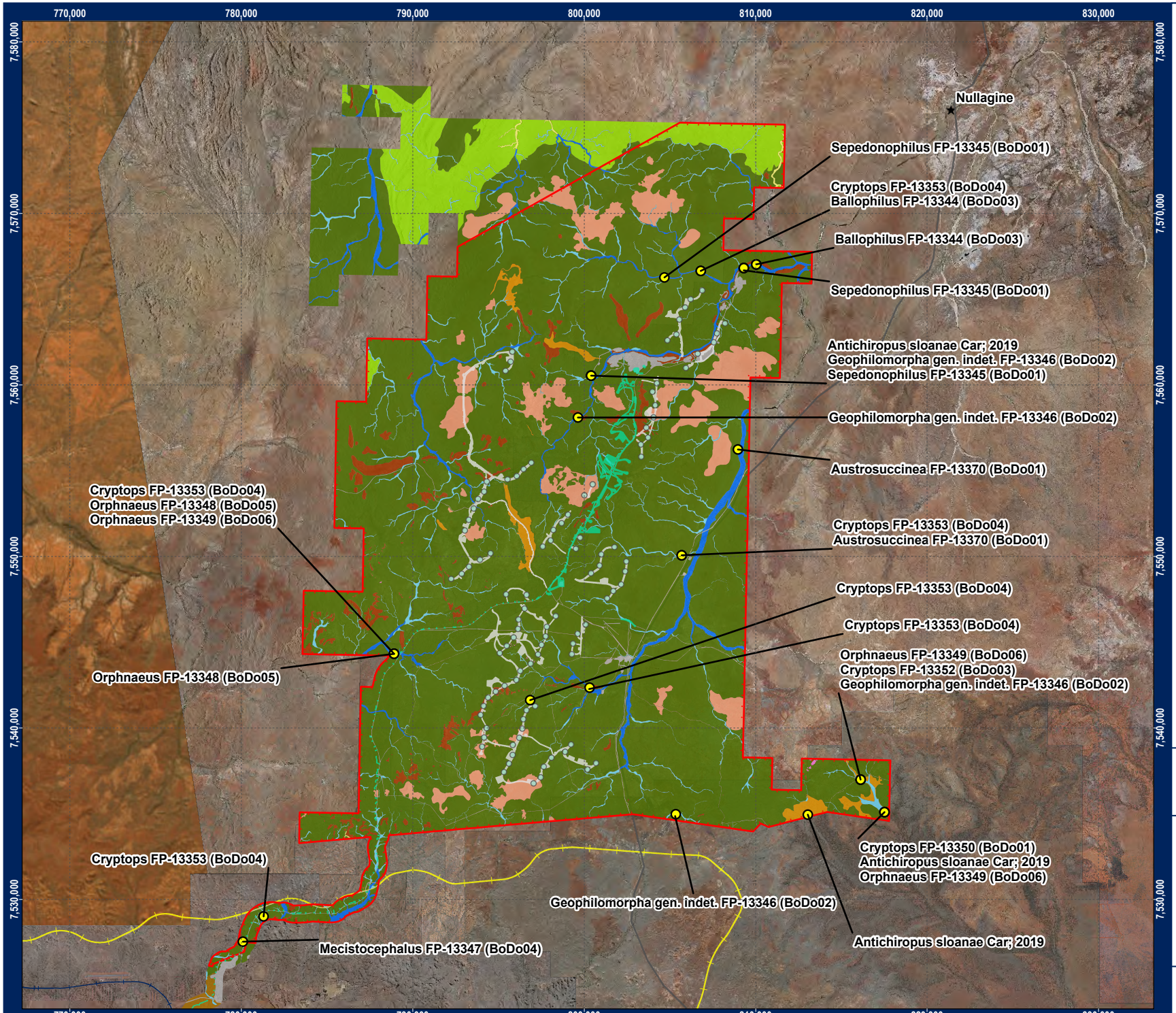

Legend

- Development Envelope
- GOV Towns
- Major Roads
- Fortescue Rail
- Roy Hill Rail
- Turbine Locations
- Indicative Disturbance Footprint
- Approved Disturbance (Nullagine Pilot Wind Farm)
- SRE Records - Chilopoda, Diplopoda, Entnognatha and Gastropoda

Fauna Habitats

- Cleared
- Drainage Line/River/ Creek (major)
- Drainage Line/River/ Creek (minor)
- Gorges/Gullies
- Granite Outcrops (flat dome)
- Hills/Ranges/Plateaux
- Plain (Cracking clays)
- Plain (stony/gibber)
- Rocky Escarpments (Ridges/Mesa/Cliffs/ Outcrops/Breakaways)
- Woodland (closed)
- Woodland (open)

Data Source(s):
Aerial, Fortescue and ESRI
All other data, Fortescue, 2025

N

0 2 4 6 8 10
Kilometers

Figure 8-11-4
Short-range Endemics (SRE) occurrences within the Development Envelope

Requested By: R. Dorji	Date: 1/29/2026
Drawn By: R. Kerr	Size: A4L
Revised By: rykerr	Revision: 0
Approved By:	Confidentiality: 0
Scale: 1:300,000	
Coordinate System: GDA 1994 MGA Zone 50	
Project Name: 4519OP002_MP_EN_0093_PartIV_2	
Document Name: 4519OP002_MP_EN_0093_027d_r0_SRE_Habitats	

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8.4.7 Introduced Fauna

Three introduced fauna species were recorded within the DE and/or immediate surrounds (ecologia, 2025b) including:

- European Cattle (*Bos primigenius taurus*),*
- Cat (*Felius catus*), and
- House Mouse (*Mus musculus*).

8.5 Potential Impacts

The Proposal activities that may impact terrestrial fauna include:

- Habitat loss from clearing terrestrial vertebrate fauna and SRE habitat in the IDF to accommodate Proposal infrastructure, including access roads, turbine pads, and substations,
- Fauna injury, mortality and disturbance due to increased vehicle movement during the construction and operational phases,
- Habitat fragmentation and behavioural change due to the long-term (up to 30 years) operation of the wind farm, which includes the turbine movements and operation of the Proposal infrastructure, and
- Behavioural changes resulting from disturbance due to general construction and operational-related activities (i.e., noise, vibration, artificial light and increase in human activities).

The potential impacts on terrestrial fauna arising from these activities include:

- Direct impacts:
    - Clearing of fauna habitat (including SRE) within the DE, including permanent and temporary clearing,
    - Clearing habitat critical to the survival of Threatened Species (Grey Falcon; Northern Quoll; PLNB, Ghost Bat, Night Parrot, Pilbara Olive Python; Peregrine Falcon),
    - Clearing critical supporting habitat for the Northern Quoll,
    - Clearing supporting habitat for Threatened Species, Priority Species and Migratory Species,
    - Barrier effects to fauna movement from turbine placement, access roads and electrical reticulation,
    - Avifauna (i.e. bird) and bat collisions with wind turbines as well as possible barotrauma,

- Avifauna (i.e. bird) and bat injury or mortality through electrocution from electrical reticulation, and
- Fauna mortality through collision with vehicles during construction and operational phase.

- Indirect impacts:
  - Habitat degradation from impacts on vegetation health
  - Introduction of invasive weed species and/or feral animals,
  - Potential increase of artificial nesting or use of artificial features as habitat,
  - Disruption to behaviour of fauna from artificial lighting, dust, noise and vibration, and
  - Increased risk of bushfires associated with construction activities and operation of new electrical infrastructure.

- Cumulative impacts:
  - Combined impacts from clearing of fauna habitats associated with the Proposal and other developments in the surrounding area,
  - Combined impacts from clearing of habitat critical to the survival of Threatened Species associated with the Proposal and other developments in the surrounding area, and
  - Combined disturbance to Threatened and Migratory Species from construction and operational activities associated with the Proposal and other developments in the surrounding area.

8.6 Mitigation

During the planning and design process for the Proposal, the mitigation hierarchy (avoid, minimise and rehabilitate) was applied to assess, avoid and minimise potential impacts to terrestrial fauna as far as practicable. Following completion of the fauna surveys, the data was reviewed against the Proposal design to minimise and where possible avoid clearing of habitat for significant species. As discussed in Section 3.1.2, initial designs included up to 200 turbines and an estimated IDF of approximately 2,044 ha. However, through an iterative assessment process and implementation of the mitigation hierarchy, the design has been refined to reduce the number of turbines to 100 and the IDF to 944.07 ha, to avoid areas that may support significant biodiversity or heritage values. Fauna habitat exclusion zones (see Figure 8-12) have also been incorporated around critical fauna habitats, with a commitment of minimal disturbance[10]. Consequently, the IDF for the Proposal is less than half that of the originally proposed design.

The following areas of biodiversity and heritage value have been avoided, where practicable, including:

- Avoidance of the drainage line/river/creek (major) habitat (except where crossing locations are required),
- Avoidance of direct disturbance of the gorges/gullies and hills/ranges/plateaux habitats, which are associated with specific fauna habitats,
- Implementation of Fauna Habitat Exclusion Zones
- Avoidance of mesas, which are associated with specific fauna habitats, and
- Avoidance of conservation significant fauna, where practicable, avoiding all existing records of conservation significant fauna.

Mitigation measures that will be implemented to avoid or minimise impacts on terrestrial fauna are summarised in Table 8-28. An EMP has been prepared to outline how the environmental impacts of the Proposal will be monitored, reported and managed for Terrestrial Fauna (Appendix B).

[10] Fortescue commits to avoiding all disturbance within the proposed fauna habitat exclusion zones The only exception is the 500 m buffer surrounding the major drainage line/river/creek habitat, where some small areas of disturbance is proposed. However, despite this allowance, no wind turbines will be placed within this buffer due to its proximity to Grey Falcon breeding habitat.

Table 8-28: Avoidance, Management and Mitigation of Impacts to Terrestrial Fauna

Impact	Management actions
Avoidance	Prior to conducting ground disturbing activities, ensure known locations of environmentally sensitive areas (such as critical habitat) to be retained and protected from disturbance are identified on the ground by appropriate signage, fencing or flagging. No-go zones will be demarcated on Proposal drawings and physically on site prior to clearing activities.
	The Proposal has undergone substantial redesign, resulting in a major reduction in scale, including a decrease in turbine numbers from 200 to 100 and a reduction in the IDF area from approximately 2,044 ha to 944.07 ha.
Minimisation	Clearing and ground disturbing activities will be limited to the defined clearing limits and boundaries described within the approval documentation. The extent of the approved clearing will be clearly communicated in documentation and site inductions. Pre-clearing photos to be documented and post clearing inspections to be undertaken.
	All site operatives and personnel attending the site will undergo an induction regarding Threatened fauna and direct and indirect impacts (e.g., risk of vehicle strike, interaction with construction activities, waste management and introduction of feral animals).
	Strict speed limits will be enforced during dawn and dusk in order to avoid fauna strikes during clearing and construction (Chapter 8)
	Consideration will be given to the use of line marking along the 33kv electrical reticulation to increase visibility to birds and bats and improve their ability to accurately perceive depth in relation to power lines. Ultraviolet (UV) line marking, if available, should also be considered, particularly with a view to minimising risks of nocturnal collisions (Dwyer *et al*., 2020). The design of both power lines and poles will comply with recommendations developed by BirdLife International (BirdLife International, 2007) to minimise potential for impacts to birds.
	Comprehensive weed hygiene management through implementation of weed management measures. All works will be undertaken in accordance with Fortescue's Weed Management Plan (Reference: 45-PL-EN-0033) (provided in Appendix E) as the standard operating procedure.
	Implementation of fire risk management measures will be undertaken including: • Clearing activities would not be undertaken when fire danger ratings are extreme or above, • Where increased risk of fire is identified, fire-resistant barriers like screens will be employed to confine sparks generated by welders and other hot work activities, • Carefully manage and monitor hot works through implementation of hot works permit system, • Ensuring appropriate disposal of potential fire-starting waste, e.g., cigarette butts to minimise the risk of bushfires as a result of the Proposal, and • Firefighting equipment will be located around the site and in vehicles. Fire response procedures and personnel training, including site inductions on fire prevention and management, will also be provided.
	All food waste will be regularly removed from site and disposed of at a licenced landfill facility to minimise attraction of feral animals,

Impact	Management actions
	Lighting will be designed and managed in accordance with the National Light Pollution Guidelines for Wildlife (DCCEEW, 2023c). These include: • Permanent lighting will be installed only where required, within operational areas, • Permanent and temporary lighting will be shielded to minimise light spill. This includes directional or shielded lighting, the mounting of light fittings as low as practicable, or louvered lighting on low-level bollards, • Automatic timers or photovoltaic switches, • Black-out blinds on windows in accommodation camps, and • Permanent and temporary lighting will be directed away from sensitive areas where possible such as areas of critical habitat.
	Standard construction noise management measures will be implemented, including: • Machinery and vehicles are regularly services and operated/maintained in accordance with the manufacturer's specifications, and preferential use of modern equipment that generally operate more quietly, • Using techniques that reduce noise, such as employing hydraulic, rather than impact methods. Training workers on best practices for minimising noise, and • Plant and machinery on site will be switched off and not left idling when not in use.
	Operational measures to reduce potential impacts associated with collision of the wind turbines includes: • Design and implementation of a bird and bat monitoring programme, which will record bird activity in the DE during construction and operation. This will include best practice estimation of actual mortality rates using current techniques (Korner-Nievergel *et al.* 2015). • A Bird and Bat Adaptive Management Plan (BBAMP) has been developed for the Proposal to minimise impacts to birds and bats, including collision impacts. This is provided in Appendix I and will be implemented through all stages of the Proposal to ensure adequacy of mitigation and minimise potential collision impacts for all avifauna species.
Rehabilitation	Progressive rehabilitation of 480.81 ha (this includes 13.94 ha of areas previously cleared by other activities not related to this Proposal) after each phase of the construction activities will reduce impacts to fauna habitat over time, including potential fragmentation impacts.

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Legend

- Development Envelope
- GOV Towns
- Major Roads
- Fortescue Rail
- Roy Hill Rail
- Turbine Locations
- Indicative Disturbance Footprint
- Approved Disturbance (Nullagine Pilot Wind Farm)

Fauna Exclusion Zones

- Drainage Line/River/ Creek (major) - 500m Buffer
- Hills/Ranges/Plateaux - 1km Buffer
- Rocky Escarpments (Ridges/Mesa/Cliffs/ Outcrops/Breakaways) - 1km Buffer
- Drainage Line/River/ Creek (major)
- Hills/Ranges/Plateaux
- Rocky Escarpments (Ridges/Mesa/Cliffs/ Outcrops/Breakaways)

Data Source(s):
Aerial, Fortescue and ESRI
All other data, Fortescue, 2025

N

0 2 4 6 8 10
Kilometers

Figure 8-12
Fauna Habitat Exclusion Zones within the Development Envelope

Requested By: R. Dorji	Date: 1/29/2026
Drawn By: R. Kerr	Size: A4L
Revised By: rykerr	Revision: 0
Approved By:	Confidentiality: 0
Scale: 1:300,000	
Coordinate System: GDA 1994 MGA Zone 50	
Project Name: 4519OP002_MP_EN_0093_PartIV_2	
Document Name: 4519OP002_MP_EN_0093_028_r0_Fauna_Excl_Zone	

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Fortescue.

8.7 Assessment of Impacts

8.7.1 Direct Impacts

8.7.1.1 Habitat Loss

The total clearing expected for the Proposal is 910.26 ha (excluding cleared areas), including 443.39 ha of permanent clearing and 466.86 ha of temporary clearing A total of 480.81 ha (this includes 13.94 ha of areas previously cleared by other activities not related to this Proposal) will be rehabilitated once construction is complete. The extent of permanent and temporary clearing of fauna habitat is described in Table 8-29 and its importance for each species is presented in Table 8-30.

Table 8-29: Clearing of Fauna Habitat within the Development Envelope

Habitat	Total mapped extent in DE (ha)	Permanent clearing (ha)	Temporary clearing (ha)	Total IDF* (ha)	Proportion of impacts within DE
Drainage line/river/creek (major)	1,657.22	0.83	0.59	1.42	0.09%
Drainage line/river/creek (minor)	2,092.13	1.03	1.48	2.50	0.12%
Gorges/gullies	41.51	0.00	0.00	0.00	-
Granite outcrops (flat dome)	12.48	0.21	0.18	0.39	3.13%
Hills/ranges/plateaux	1,322.34	0.00	0.00	0.00	-
Plain (cracking clays)	5,366.12	42.68	44.51	87.19	1.62%
Plain (stony/gibber)	75,547.94	378.20	408.60	786.80	1.04%
Rocky escarpments (ridges/mesa/cliffs/outcrops / breakaways)	2,123.25	14.88	11.51	26.40	1.24%
Woodland (open)	574.28	5.56	0.00	5.56	0.97%
Woodland (closed)	392.02	0.00	0.00	0.00	-
Total	**89,129.29***	**443.39***	**466.86***	**910.26***	

* Excludes previously cleared areas

Overall, the mapped habitat areas within the IDF are proportionally small compared to the DE. Greater than 95% of each habitat type within the DE will remain after implementation of the Proposal (Table 8-29). The majority of habitats are well represented within the DE, and the Woodland (open) and (closed), Plain (stony/gibber), Rocky Escarpments (Ridges/Mesa/Cliffs/Outcrops/Breakaways), Drainage Line/River/Creek (major) and (minor) are all well represented in the surrounding region (ecologia, 2025b).

The granite outcrops (flat dome) were reported to have a restricted extent within the DE and broader region (ecologia, 2025b). Up to 0.39 ha of this habitat type will be cleared for the Proposal, which represents 3.13% of the total habitat type mapped within the DE.

When considering the above, it is expected that no fauna habitat will be significantly impacted on a local or regional scale due to the clearing associated with the Proposal.

Following completion of construction, 480.81 ha will be rehabilitated (this includes 13.94 ha of areas previously cleared by other activities not related to this Proposal), reducing the permanent clearing to 443.396 ha. This will further reduce any potential impacts on the habitat types recorded in the DE.

Conservation Significant Fauna

Potential impacts to significant fauna species, including consideration of critical and supporting habitat, are detailed in Table 8-30.

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Table 8-30: Clearing of Threatened Fauna Habitat within the Development Envelope

Threatened and other Specially Protected Species	Habitat importance	Total mapped extent in DE (ha)	Total IDF (ha)	Proportion of impacts within mapped extent in DE (%)
Northern Quoll	Northern portion of DE - Rocky escarpments (ridges/mesa/cliffs/outcrops/breakaways) – critical habitat	1,302.62	14.95	1.15
	Northern portion of DE - Gorges/gullies – critical habitat	36.70	0.00	-
	Northern portion of DE - Hills/ranges/plateaux – critical habitat	1,322.34	0.00	-
	Northern portion of DE - 1 km buffer around critical habitat – critical supporting habitat	18,462.97	238.24	1.29
	Drainage line/river/creek (major) outside 1km buffer – supporting habitat	1,242.61	0.00	-
	Southern portion of DE - Rocky escarpments (ridges/mesa/cliffs/outcrops/breakaways) – supporting habitat	820.18	11.45	1.40
	Southern portion of DE - Gorges/gullies – supporting habitat	4.81	0.00	-
	Southern portion of DE - Granite outcrops (flat dome) – supporting habitat	12.48	0.39	3.13
	Total Northern Quoll critical habitat	**2,661.66**	**14.95**	**0.56**
	Total Northern Quoll critical supporting habitat	**18,462.97**	**238.24**	**1.29**
	Total Northern Quoll supporting habitat	**2,080.08**	**11.84**	**0.57**
PLNB	Hills/ranges/plateaux – critical habitat	1,322.34	0.00	-
	Gorges/gullies – critical habitat	41.51	0.00	-
	Rocky escarpments (ridges/mesa/cliffs/outcrops/breakaways) – critical habitat	2,123.25	26.40	1.24
	Drainage lines/river/creek (major) – critical habitat	1,657.22	1.42	0.09
	All other habitats – supporting habitat	83,984.97	882.44	1.05
	Total PLNB critical habitat	**5,144.32**	**27.82**	**0.54**
	Total PLNB supporting habitat	**83,984.97**	**882.44**	**1.05**
Grey Falcon	Drainage line/river/creek (major) – critical habitat	1,657.22	1.42	0.09

Threatened and other Specially Protected Species	Habitat importance	Total mapped extent in DE (ha)	Total IDF (ha)	Proportion of impacts within mapped extent in DE (%)
	All other habitat - supporting habitat	87,472.07	908.83	1.04
	Total Grey Falcon critical habitat	1,657.22	1.42	0.09
	Total Grey Falcon supporting habitat	87,472.07	908.83	1.04
Pilbara Olive Python	Hills/ranges/plateaux – critical habitat	1,322.34	0.00	-
	Gorges/gullies – critical habitat	41.51	0.00	-
	Rocky escarpments (ridges/mesa/cliffs/outcrops/breakaways) – critical habitat	2,123.25	26.40	1.24
	Drainage lines/river/creek (major) – critical habitat	1,657.22	1.42	0.09
	Total Pilbara Olive Python critical habitat	**5,144.32**	**27.82**	**0.54**
Ghost Bat	Hills/ranges/plateaux – critical habitat	1,322.34	0.00	-
	Gorges/gullies – critical habitat	41.51	0.00	-
	Rocky escarpments (ridges/mesa/cliffs/outcrops/breakaways) – critical habitat	2,123.25	26.40	1.24
	Drainage lines/river/creek (major) – critical habitat	1,657.22	1.42	0.09
	All other habitats – supporting habitat	83,984.97	882.44	1.05
	Total Ghost Bat critical habitat	**5,144.32**	**27.82**	**0.54**
	Total Ghost Bat supporting habitat	**83,984.97**	**882.44**	**1.05**
Night Parrot	Patches of long unburnt vegetation with *Triodia longiceps* – critical habitat*	4,882.01	11.45	0.23
	Patches of long unburnt plain (stony/gibber) – critical habitat	17,941.43	270.36	1.51
	Plain (cracking clays) – supporting habitat	5,366.12	87.19	1.62
	Total Night Parrot critical habitat	**22,823.44**	**281.81**	**1.23**
	Total Night Parrot supporting habitat	**5,366.12**	**87.19**	**1.62**
	Drainage lines/rivers/creeks (major) – supporting habitat	1,657.22	1.42	0.09

Threatened and other Specially Protected Species	Habitat importance	Total mapped extent in DE (ha)	Total IDF (ha)	Proportion of impacts within mapped extent in DE (%)
Australian Painted Snipe	**Total Australian Painted Snipe supporting habitat**	**1,657.22**	**1.42**	**0.09**
Peregrine Falcon (other specially protected)	Rocky escarpments (ridges/mesa/cliffs/outcrops/breakaways) – critical habitat	2,123.25	26.40	1.24
	Drainage lines/rivers/creeks (major) – critical habitat	1,657.22	1.42	0.09
	All other habitats – supporting habitat	85,348.82	882.44	1.03
	Total Peregrine Falcon critical habitat	**3,780.47**	**27.82**	**0.74**
	Total Peregrine Falcon supporting habitat	**85,348.82**	**882.44**	**1.03**

*ecologia (2025b) derived the areas from vegetation mapping of the flora survey, occurring on multiple fauna habitat types.

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Northern Quoll

During the field surveys, the Northern Quoll was recorded on 229 occasions within the DE. The Northern Quoll was recorded in the drainage line/river/creek (major) and rocky escarpment (ridges/mesa/cliffs/outcrops/breakaways) habitats (ecologia, 2025b). As discussed, based on the number of individuals identified (at least 17 individuals deduced from spot analysis and trapping, and frequency of detections (219 independent motion camera visits) during field surveys, the northern half of the DE appears to support a high density, reproductive population of Northern Quolls (ecologia, 2025b).

Clearing up to 11.84 ha of supporting habitat in the southern section of the DE for the Northern Quoll represents only 0.57% of the total mapped extent of this habitat and is therefore not expected to result in a significant impact to this species.

However, the clearing of up to 253.19 ha of critical habitat and critical supporting habitat in the northern section represents 1.20%% of the mapped extent within the DE. As this is critical habitat for the Northern Quoll and the species was recorded within the DE in relatively high abundance, the clearing of up to 14.95 ha of critical habitat (of which 8.09 ha is permanent clearing and 6.86 ha is temporary clearing), and 238.24 ha of critical supporting habitat, is considered a significant impact.

PLNB and Ghost Bat

The majority of the PLNB calls were recorded within the drainage line/river/creek (major) habitat and adjacent to water sources (mostly dams) during wet season (ecologia, 2025b). There were no low-time calls (calls within 20 minutes of sunset or sunrise) indicative of a nearby potential roost site during current or previous surveys (ecologia, 2025b).

Similarly, the Ghost Bat was recorded on motion camera within the drainage line/river/creek (major) habitat in the northern extent of the DE (ecologia, 2025b and ecologia, 2026), which represents critical habitat for these species.. The rocky escarpments (ridges/mesa/cliffs/outcrops/breakaways) also provide critical habitat for the PLNB and Ghost Bat. Clearing of up to 27.82 ha of critical roosting and foraging habitat (Rocky escarpments (ridges/mesa/cliffs/outcrops/breakaways) and drainage lines/river/creek (major)) for the Ghost Bat and PLNB represents 0.54% of the mapped extent of critical habitat within the DE. No suitable roost caves were identified within the DE and no call times indicate a nearby roost site despite extensive survey effort over multiple seasons (ecologia, 2025b). While the PLNB and Ghost Bat are currently unlikely to roost in the DE, clearing of potential roosting habitat has the potential to limit the ability of the species to inhabit the area should other habitats surrounding the DE become unsuitable. As such, clearing of critical habitat represents a potentially significant impact.

Clearing of up to 882.44 ha of supporting habitat (all other habitat types) for the Ghost Bat and PLNB represents 1.05% of the mapped extent within the DE. Clearing of this supporting habitat for the Ghost Bat and PLNB is not considered to have a significant impact on the species due to the abundance of habitat remaining in the DE and wider area, as detailed in Table 8-30. Impacts related to collision risk for these species is discussed in Section 8.7.1.2.

Grey Falcon

The Grey Falcon was recorded in the DE on nine occasions during the recent field surveys (ecologia, 2025b and ecologia, 2026). There were observations in the drainage line/river/creek

(major and minor), woodland (open) plain (stony/gibber) and cleared habitats (ecologia, 2025b; ecologia, 2026).

Clearing of 1.42 ha of critical habitat for the Grey Falcon represents 0.09% of its mapped extent within the DE. Clearing up to 908.83 ha of supporting habitat for this species (all other habitat types) represents 1.04% of the habitat's mapped extent within the DE. Clearing of critical and supporting habitat for the Grey Falcon is not considered to be a significant impact as trees containing active nests for the Grey Falcon will not be cleared, and remaining habitat in the DE and wider area will not be impacted as detailed in Table 8-30. Impacts related to collision risk for this species are discussed in Section 8.7.1.2.

Pilbara Olive Python

The species was recorded once in the DE within the plain (stony/gibber) habitat; once within the Survey Area (approximately 7 km from the DE) and once inside the DE (ecologia, 2025b).

Clearing of 27.82 ha of Pilbara Olive Python critical habitat represents 0.54% of the mapped extent of these habitat types within the DE. As the clearing extent equates to less than 1% of the available critical habitat within the DE and there is further suitable habitat in the wider area, this is not considered a significant impact to the species.

Night Parrot

Targeted Night Parrot surveys were undertaken as a part of the ecologia (2025b) survey using acoustic monitoring. Night Parrot calls were not recorded during recent surveys, and it is considered unlikely that a long-term stable Night Parrot roost exists in the areas immediately surrounding the points sampled. It is also considered unlikely that Night Parrots were foraging in proximity to these surveyed points at the time of sampling (ecologia, 2025b).

Clearing of 281.81 ha of Night Parrot critical habitat represents 1.23% of the mapped extent of these habitats within the DE. Clearing of 87.19 ha of Night Parrot supporting habitat represents 1.62% of the mapped extent of these habitat types within the DE. Clearing of these habitats is not anticipated to have a significant impact on the species due to the lack of records of this species in the area and the abundance of remaining suitable habitat within the DE, as well as the surrounding area (Table 8-30). Additionally, clearing for the Proposal is predominantly linear and if a population of Night Parrots were to utilise the DE, they could make use of habitat adjacent to the IDF. The collision risk for this species is detailed in Section 8.7.1.2.

Australian Painted Snipe

This species was not recorded during recent field surveys (ecologia, 2025b). Clearing of 1.42 ha of supporting habitat (Drainage lines/rivers/creeks (major)) for the Australian Painted Snipe represents 0.09% of the mapped extent of this habitat within the DE. Clearing of this supporting habitat is not considered a significant impact on this species due to abundance of this habitat in the DE and wider area, lack of records of this species within the DE and the presence of more suitable habitat within the Fortescue Marsh 9.3 km from the DE. The risk of collision for this species is detailed in Section 8.7.1.2.

Peregrine Falcon

This species was not recorded during recent field surveys (ecologia, 2025b). The Peregrine Falcon is listed as 'other specially protected species'. Clearing up to 27.82 ha of critical habitat for this species represents 0.74% of the mapped extent within the DE. Clearing up to 882.44 ha of supporting habitat (all other habitat types) for this species represents 1.03% of the mapped extent within the DE. Given the habitat remaining in the DE and wider area, this clearing is not considered to result in a significant impact to this species. The risk of collision for this species is detailed in Section 8.7.1.2.

Priority Fauna

Five Priority fauna species have been recorded from within the DE or have a high likelihood of occurrence, as detailed in Section 8.4.1. Given these are all ground dwelling species of marsupials, reptile or rodent, the primary impacts from the Proposal relating to these species will be associated with clearing of supporting habitat within the DE. The relevant Priority species and their associated supporting habitat are reported in Table 8-31 with details of the proportionate impact to each species habitat. There was no critical habitat in the DE for any of the five Priority fauna species (ecologia, 2025b)). Impacts related to collision risk for these species is discussed in Section 8.7.1.2.

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Table 8-31: Clearing of Priority Fauna Supporting Habitat within the Development Envelope

Species	Habitat importance	Total mapped extent in DE (ha)	Total IDF (ha)	Proportion of impacts within mapped extent in DE
Gane's Blind Snake	Hills/ranges/plateaux	1,322.34	0.00	-
	Plain (stony/gibber)	75,547.94	786.80	1.04%
	Gorges/gullies	41.51	0.00	-
	Drainage line/river/creek (major)	1,657.22	1.42	0.09%
	Total Gane's Blind Snake (supporting) habitat	**78,569.01**	**788.22**	**1%**
Brush-tailed Mulgara	Plain (stony/gibber)	75,547.94	786.80	1.04%
	Total Brush-tailed Mulgara (supporting) habitat	**75,547.94**	**786.80**	**1.04%**
Short-tailed Mouse	Plain (cracking/clays)	5,366.12	87.19	1.62%
	Drainage lines/rivers/creeks (minor)	2,092.13	2.50	0.12%
	Total Short-tailed Mouse (supporting) habitat	**7,458.25**	**89.69**	**1.20%**
Western Pebble-mound Mouse	Rocky escarpments (ridges/mesa/cliffs/outcrops/breakaways)	2,123.25	26.40	1.24%
	Hills/ranges/plateaux	1,322.34	0.00	-
	Plain (stony/gibber)	75,547.94	786.80	1.04%
	Total Western Pebble-mound Mouse (supporting) habitat	**78,993.53**	**813.20**	**1.03%**
Long-tailed Dunnart	Rocky escarpments (ridges/mesa/cliffs/outcrops/breakaways)	2,123.25	26.40	1.24%
	Gorges/gullies	41.51	0.00	-
	Granite outcrops (flat dome)	12.48	0.39	3.13%
	Hills/ranges/plateaux	1,322.34	0.00	-
	Total Long-tailed Dunnart (supporting) habitat	**3,499.58**	**26.79**	**0.77%**

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As detailed in Table 8-31, S greater than 98% of the mapped extent of supporting habitat within the DE for each Priority fauna species o will remain. Further, following construction, 480.81 ha will be rehabilitated (this includes 13.94 ha of areas previously cleared by other activities not related to this Proposal). In addition, the Priority fauna supporting habitat types recorded are part of much larger units extending beyond the DE. This is with the exception of the granite outcrops (flat dome) habitat type used by the Long-tailed Dunnart, which was reported to have a restricted extent within the DE and broader region (ecologia, 2025b). Up to 0.39 ha of this habitat type will be cleared, representing 3.13% of the total habitat type mapped within the DE. Therefore, clearing of habitats as detailed in Table 8-31 will be negligible in relation to the full extent of these habitats in the surrounding area.

Migratory Species

The Fork-tailed Swift was recorded on four occasions during the wet season survey conducted in February 2025 and Oriental Plover was recorded on a single occasion during the southward migration in September 2024 (ecologia, 2025c). No supporting or critical habitat for the Fork-tailed Swift is considered to occur in the DE as the species does not utilise terrestrial habitats; however, may utilise the airspace above the study area while transiting (ecologia, 2025b). All habitat types mapped within the DE (89,129.29 ha) are considered supporting habitat for the Oriental Plover, of which 910.26 ha is to be cleared within the IDF.

An additional nine migratory species were classified as ‘Moderate’ likelihood of occurrence, as detailed in Section 8.4.1.2. Suitable supporting habitat within the DE for these species is limited to 1,657.22 ha of drainage lines/rivers/creeks (major) habitat , of which up to 1.42 ha will be cleared in the IDF (representing 0.09% of this habitat type within the DE). Given the aerial nature of the Migratory species and the more suitable habitat (Fortescue Marsh nature reserve) within 9.3 km of the DE, the removal of suitable supporting foraging and dispersal habitat from the Proposal will result in negligible impacts to these species. Impacts to these Migratory species in relation to direct collisions with wind turbines is discussed in Section 8.7.1.2.

Short-Range Endemic Invertebrates

As detailed in Section 8.4.6, there is no significant association between specific habitat and numbers of SRE species. None of the four habitat categories sampled in the survey had a significant number of SRE target groups (HBI, 2024).

With respect to conservation significant species, the keeled millipede *Antichiropus sloanae* is a confirmed SRE that was collected in the DE during the SRE field survey, but it is also known from records outside of the DE. It is listed as Priority 1 under Western Australian conservation legislation. This species was recorded at three sites within the DE, one in the central northern portion of the DE and two close to the south eastern boundary (as shown in Figure 8-11), none of the sites were within the IDF. Given *Antichiropus sloanae* is known from outside of the DE and the relatively small amount of clearing proposed compared to the wider DE, a significant impact on this species is not anticipated.

8.7.1.2 Bird and Bat Collision with the Operational Wind Farm Infrastructure

The presence of wind turbines is a potential risk for bird and bat collisions during operational activities. This risk is mainly due to rotating wind turbine blades; however, collisions with turbine towers and motionless blades can also occur, especially among birds. A review of existing literature in relation to bat impacts of wind farms has been undertaken and is presented in Appendix J.

A study of existing collision risk models (CRM) has been undertaken for the Proposal (HBI, 2026a). Utilising the BBSUS conducted for the Proposal and the Australian Database for Birds (BirdLife Australia, 2025). Two CRM models were run including the widely used Band model (Band *et al*., 2007), and a New Model that was developed as part of the ongoing research for the Proposal. There are some limitations with the Band model approach as the method used to determine interactions with the rotor swept area (RSA makes approximations that overestimate the number of interactions with Wind Turbine Generators (WTG) (HBI, 2026a) because it assumes an extended two-dimensional plane in which the WTGs are situated. The New Model is designed to be more flexible, allowing increasing levels of site-specific information to be incorporated as more data is obtained, and uses a 3-dimensional approach to predict bird location and WTG interaction.

Simulations were run for species observed within the area flying at heights that would be within the rotor sweep area (RSA) of the proposed wind turbines. Where possible, data from the two Robin Radar MAX units on site was analysed and prepared for use in the simulation models. Results from the two models (Band Option 2 with 99.5% avoidance, New Model with 90% avoidance) were consistent and identified the same bird species at risk at similar levels. This report has been provided in Appendix K and the results are discussed below. It should be noted that the results of the CRM discussed below include both the Proposal and the combined impact from the nearby Nullagine Pilot Wind Farm currently under development (within the DE) as a worst-case conservative assessment. An analysis of the combined risk to birds via collision with the WTG from both the Proposal and the Nullagine Pilot Windfarm (total of 117 turbines) was performed.

Potential Collision Impacts on Avifauna and Bats

The majority of the 128 bird and bat taxa recorded in the Survey Area during the ecologia (2025b) and ecologia (2026) surveys were not listed as Threatened under the BC Act or as Priority fauna by DBCA and are typically low-flying and/or canopy-dwelling species which are unlikely to be at risk of collision with turbines (ecologia, 2026). At-risk species recorded during the BBSUS (ecologia 2026) were predominantly raptors (15 species) and waterbirds (26 species). These species belong to groups considered to be at greater risk of turbine collision due to flight demographics and behavioural attributes.

One Threatened (the Grey Falcon) and two migratory (Fort-tailed Swift and Oriental Plover) bird species were recorded within the DE (ecologia, 2025b and 2026). Additionally, the following species were considered post-survey as ‘High’ or ‘Moderate’ likelihood of occurrence: Night Parrot, Australian Painted Snipe, Common Greenshank, Peregrine Falcon and eight Migratory species (ecologia, 2025b).

CRM simulations (HBI, 2026a) were run for the 13 species that were observed in the DE, flying at heights that would be within the rotor sweep area (RSA) of the proposed WTGs. This includes the conservation listed species, the Grey Falcon. Where sufficient flight height data was not available for a particular species to accurately include within the RSA of CRM, expert elicitation on collision risk has been used from Reid and Baker (2025) as the proposed WTGs most appropriate current literature. It should be noted that the collision risk estimates presented in the CRM (HBI, 2026a) represent inherent (unmitigated) collision risk and do not account for the potential reduction achievable through management and design measures that may be adopted during project development or operations (e.g., curtailment, deterrent/monitoring systems, or blade marking/painting). The CRM results are presented in Appendix K.

Threatened Fauna

Four Threatened bird species and one specially protected bird species have medium to high likelihood of being present within the DE (ecologia, 2026).

With regard to the Grey Falcon species recorded during the survey, the species is likely to predominantly use the DE for foraging across all habitats, with potentially nesting associated with the major drainage line/river/creek (major) habitat. Flight heights recorded during incidental observations in the ecologia (2026) survey range from 0 m (ground level) to 235 m, with seven observations involving birds flying within the proposed RSA height (ecologia, 2026). Of the existing Pilbara records and sightings from the BBSUS for the Proposal, about one third identified the flight height as being sufficient to place the bird in the RSA. Both models rated the Grey Falcon of being in danger of losing less than 2% of the modelled local population each year due to collision with the WTG. This is a relatively low value (estimated 1 bird collision every ~12 years for the adult population of ~2 pairs), which would mean the population would maintain sustainable levels.

Although the Grey Falcon species may overfly all habitat types during dispersing and foraging activities, hunting and breeding activities primarily occur within the Drainage Line/River/Creek habitat types. Many of the grey falcon sightings have been recorded within creek lines and rivers or adjacent habitat, with the Bonnie Creek, Nullagine River, Coongan River and associated tributaries providing movement corridors for the species within the survey area (ecologia, 2026). Therefore, with the substantially reduced number of turbines proposed compared to the original design, and incorporation of fauna habitat avoidance areas around the majority of Drainage Line/River/Creek habitat types, potential interaction with the WTG has been minimised.

The Night Parrot was not recorded in the DE, and there is no flight height data for this or closely related species from which to carry out CRM. These birds usually stay just above vegetation, flying low and fast when flushed, often in zigzag patterns, but have been recorded covering significant distances (18-41 km in a night) (Murphy *et al.*, 2017) between roosting/feeding sites. There is only 1 record of the species in the Pilbara (ALA, 2025) and none within the DE recorded as part of BBSUS (ecologia, 2026) with limited preferred habitat within the DE. Reid and Baker (2025) classed this species as likely to have a low chance of flying within RSA height (class 2, noting that class 1 was attributed to flightless and resident obligate ground foraging birds). Therefore based on these expert assessments within the available literature, the species would have low likelihood of turbine collision.

For the Peregrine Falcon, there are 120 records of the species in the Pilbara (ALA, 2025), but none have been recorded in the DE as part of BBSUS (ecologia, 2025b; ecologica, 2026). Consequently, without flight height data, CRM could not be carried out for this species. Reid and Baker (2025) attributed the highest risk profile flight height (class 5) and second-highest categorisation (class 4) for amount of time spent in flight for this species, with a high overall turbine risk categorisation. However, this assessment estimated threat of collision for an RSA between 30 to 275 m whilst the Proposal WTGs have a much higher RSA (>100m). In order to mitigate any potential collision impacts to the species, a Bird and Bat Adaptive Management Plan (BBAMP) has been developed (provided in Appendix I) and is discussed further in the following section.

The Australian Painted Snipe is listed as Endangered under the BC Act. The Common Greenshank and Sharp-tailed Sandpiper are designated as both Threatened and Migratory species. Neither of these species have been recorded within the DE during the BBSUS

(ecologia, 2025b; ecologica, 2026) and therefore could not be modelled due to lack of height data. Reid and Baker (2025) attributed a high overall turbine risk categorisation for the Australian Painted Snipe, however this assessment estimated threat of collision for an RSA between 30 to 275 m whilst the Proposal WTGs have a much higher RSA (>100m). The mitigation measures detailed in the BBAMP and summarised in the following section will minimise potential collision risk such that no significant impacts on this species are anticipated. The Common Greenshank and Sharp-tailed Sandpiper are discussed further in the Migratory Species section below.

Migratory Species

Eleven Migratory bird species were either recorded (Fork-tailed Swift and Oriental Plover) or have moderate likelihood of being present within the DE (ecologia, 2026).

The Migratory species recorded during the BBSUS surveys typically fly at heights significantly higher than the RSA for the Proposal during migration, with typical flight heights reported between 1,000-5,000 m (Geering *et al*., 2007). As these species are likely utilising the DE as dispersal (overfly) habitat when travelling to the Fortescue Marsh (ecologia, 2025b), flight heights would likely be higher than the RSA during these activities. However, these Migratory species were also reported to potentially forage within the drainage lines/creeks/rivers (major) habitat, with flight heights much closer to ground level. Fork-tailed Swift was observed flying below the RSA on all four recording occasions, while the Oriental Plover was recorded on a single occasion, also flying well below the RSA (ecologia, 2026).

Birds, especially Migratory species, use thermals to gain elevation from lower altitudes without expending too much energy, especially during long flights or while searching for food. The Pilbara's arid environment, with its varied topography and vegetation, provides suitable conditions for the formation of thermals, which birds use for elevation. Therefore, where individuals of Migratory species are engaging in thermal soaring activity and gaining altitude from the lower elevations recorded, they would be at a heightened risk of collision with the operation turbines and as such, a residual risk of bird mortalities from collision remains.

There was a single record of Oriental plover and therefore insufficient data to carry out CRM for this species. Although this species has been attributed by Reid and Baker (2025) 'class 2' for flight height (noting that class 1 was attributed to flightless and resident obligate ground foraging birds), the Oriental Plover has been given a score of class 4 for flight time, in recognition of its migration behaviour, with an overall risk categorisation of medium. However, this assessment estimated threat of collision for an RSA between 30 to 275 m whilst the Proposal WTGs have a much higher RSA (>100m).

Population estimates for the Fork-tailed Swift are unknown; however, populations are believed to be stable throughout most of its range, except in Pakistan (del Hoyo *et al*. 1996). There are currently no measures of abundance in Australia (DoE, 2024a), however this species has commonly been observed during previous surveys commissioned by Fortescue in the region, with over 700 individuals observed at 31 locations recorded in Fortescue's survey database. CRM for Fork-tailed Swift has not been carried out as this species was not observed within the RSA. Reid and Baker (2025) attributed the highest risk profile flight height and amount of time spent in flight for this species, with a high overall turbine risk categorisation for this species. However, this assessment estimated threat of collision for an RSA between 30 to 275 m whilst the Proposal WTGs have a much higher RSA (>100m). Although this species was recorded on four occasions within the DE, it was observed flying below the RSA on all

occasions (ecologia, 2026), however an inherent risk of bird mortalities associated with the Proposal remains.

In order to mitigate any potential collision impacts to the species, a Bird and Bat Adaptive Management Plan (BBAMP) has been developed (provided in Appendix I). The BBAMP outlines specific mitigation measures designed to reduce the risk of significant impacts on bird and bat species from implementation of the Proposal. Additional measures may be implemented following the investigation of triggers being reached or exceeded and the BBAMP reviewed. Measures may include, but are not limited to, those currently being investigated by Fortescue through trials at the Nullagine Pilot Wind Farm and via research projects in collaboration with the HBI. The ongoing, preventative mitigation measures include visual and acoustic deterrents (e.g. painted turbine blades); curtailment protocols (e.g. blade feathering, radar or camera based smart curtailment); lighting controls; and carrion removal.

A carcass search programme will be implemented to monitor the frequency of bird and bat mortality due to collision or barotrauma associated with the Proposal from which the total number of mortalities can be estimated. This will be used to assess the accuracy of mortalities/featherspots/injured individuals recorded by the carcass search program and inform appropriate responses or extension of the program's implementation. Through ongoing monitoring of impact trigger levels detailed in the BBAMP (Appendix I), and implementation of adaptive management, significant impacts to this species are not anticipated.

The remaining nine migratory waterbirds were not recorded during the BBSUS (ecologia, 2025b and 2026), and have a moderate likelihood of occurrence in the DE. Reid and Baker (2025) outlines the following overall turbine risk categories:

- Common Greenshank - High
- Caspian tern – High;
- Sharp-tailed sandpiper – High;
- Gull-billed tern – High;
- Glossy ibis – High;
- Common sandpiper – Medium;
- Red-necked stint – Medium; and
- Wood sandpiper – Medium.
- Marsh sandpiper was not assigned an overall risk category and therefore no Reid & Baker (2025) overall risk category is available for this species.

However, this assessment estimated threat of collision for an RSA between 30 to 275 m whilst the Proposal WTGs have a much higher RSA (>100m). Therefore, the lower bound of the rotor-swept area is substantially higher than the minimum rotor heights assumed, which means the proportion of flights occurring within the rotor-risk height band could be lower for some wetland-associated species if their local movements are predominantly at low altitude (NatureScot 2025).

Given that these species (other than Fork-tailed Swift and Oriental Plover) were not recorded in the BBSUS (ecologia, 2025b, 2026), all of these species are expected to potentially overfly and/or forage at a relatively low abundance. Estimates of the East Asian Flyway population have been outlined below to show that the expected small number of individuals utilising the DE is not anticipated to be significant at a population level. The total estimated East Asian Flyway population of the relevant Migratory species are (Hansen *et al.,* 2016):

- 110,000 birds – Common Greenshank,
- 190,000 birds – Common Sandpiper,
- 85,000 birds – Sharp-tailed Sandpiper,
- 475,000 birds – Red-necked Stint,
- 230,000 birds – Oriental Plover,
- 130,000 birds – Wood Sandpiper, and
- 130,000 birds – Marsh Sandpiper.

The estimated East Asian Flyway population is not provided for three species: the Gull-billed Tern, Caspian Tern and Glossy Ibis. The global population of the Gull-billed Tern has not been estimated separately, however, the estimated combined population of the Gull-billed Tern and Australian Gull-billed Tern is between 150,000 to 420,000 individuals (Delany & Scott, 2006). The total population of the Caspian Tern is estimated to be between 240,000 and 420,000 individuals (BirdLife International, 2010). The Glossy Ibis has an estimated population size between 1,200,000 and 3,200,000 individuals worldwide (BirdLife International, 2010). Given the relative abundance of these species at a population level, the small number likely to occur in the DE (based on the survey effort) would not represent a substantial portion of the wider population. Therefore, any potential impacts to these species from collision are not anticipated to be significant at a regional or population level.

Any potential impacts will be minimised as far as practical through the implementation of mitigation measures outlined in Section 8.6 and the BBAMP (Appendix I).

Non-conservation Significant Avifauna

The BBSUS (ecologia, 2025b and 2026) also recorded non-conservation significant avifauna movements and considered potential impacts to these species from operation of the Proposal. Flight height analysis was undertaken for systematic raptor and waterbird observations recorded during set-time surveys. The majority of flights (58.16%) recorded during set-time surveys were undertaken at heights below 60m, 15.41% of flights were undertaken at heights between 60-80 m and 9.72% of flights were undertaken at heights between 80-100m (Table 16). Only 8.17% of flights recorded during set-time surveys were undertaken at heights of greater than 100 m, and therefore with potential to interact with the RSA.

The little black cormorant and white-necked heron were the only waterbirds recorded flying at heights greater than 100 m during the set-time surveys, with the pacific black duck, black-fronted dotterel, white-faced heron and little pied cormorant recorded flying at heights of up to 100m. Four additional species of raptor were recorded flying at heights greater than 100 m during set-time surveys: the brown falcon, spotted harrier, wedge-tailed eagle and the

whistling kite. These species belong to groups considered to be at greater risk of turbine collision due to flight demographics and behavioural attributes.

CRM was run for 12 non-conservation significant avifauan species where there was sufficient data available. The species with highest collision risk was identified as the Wedge-tailed eagle (11.67% for the Band Option 2 model with 99.5% avoidance rate, and 4.47% for the New Model with 90% avoidance rate). This raptor was commonly recorded at the site. This species also had the most BBSUS and radar records, and so the modelling estimates for flight height were most reliable. Straw-necked ibis (7.0%, 2.75%), Australian pelican (2.77%, 5.25%), Little black cormorant (2.04%, 1.35%) and Masked woodswallow (2.19%, 1.55%) were estimated as next in terms of collision likelihood. All other species were computed to have relatively low collision risk, with estimates <2% for both models.

Any potential impacts will be minimised as far as practical through the implementation of mitigation measures outlined in Section 8.6 and the BBAMP (Appendix I).

Potential Bat Collision Impacts with Proposal Wind Turbines

At least twelve bat taxa have been recorded within the survey area (ecologia, 2025b; 2026), including echolocation calls belonging to at least 10 bat species during the BBSUS (ecologia, 2026). Two of these species are conservation significant (Ghost bat and PLNB). Available published data on bat mortalities at Australian wind farms represents species bias, as operational wind farms are principally in NSW and Victoria; consequently, there is no evidence of collision fatalities for 4 of the 10 microbat species recorded at the DE, as their geographic range does not currently overlap with operational wind farms (HBI, 2026b). For example, there are no turbine collisions records for PLNB. Furthermore, although Ghost bat range does overlap with wind farms in northern Queensland, there are also no available records of collision fatalities (HBI, 2026b).

As part of the research undertaken for the Proposal, HBI (2026b) reviewed four traits-based protocols for predicting bat wind turbine collisions and compared these with the predictions for the 10 bat species present at Bonney Downs. This report is provided in Appendix J. The fatality threat categories provided in their international review by Voigt et al. (2024) are generally most conservative (8/10 species classed as having high risk of turbine collision). In their Australia-wide categorisation, Reid and Baker (2025) classed four species as having High risk of turbine collision, while Specialised Zoological (2025) identified only two species as having high risk of turbine collision for their categorisation tailored specifically to the Proposal.

PLNB is categorised as low risk of wind turbine collision based on its foraging style (unlikely to fly higher than 50 m) and small number of records close to the DE (Specialised Zoological 2024, 2025). Reid and Baker (2025) classed the species as high overall impact of wind turbines, largely due to scores attributed to the species' habitat specialisation and population status (VU). However, the same authors attributed low risk scores for flight height and flight mobility score. Ecological (foraging strategy) and biological (wing morphology) information indicates that this species forages close to the ground near vegetation and is unlikely to fly into the RSA. Expert elicitation for the Bonney Downs study site similarly classifies this species has having low likelihood of flying above 50 m (Specialised Zoological, 2024), therefore anticipated to be well outside the RSA. No roost structures have been recorded in the DE, and based on call data, no roosts appear likely to occur. Occurrence within the DE is therefore considered low, with only infrequent foraging activity recorded. Coupled with low activity records, the species is overall classed as low risk of wind turbine collision (Specialised

Zoological, 2025). HBI (2026b) have undertaken a review of the available literature and concluded the species is at low risk of collision.

Similarly, the Ghost Bat as having a low collision risk but High overall impact of wind turbines, largely due to scores attributed for population vulnerability (conservation rating) and foraging habitat selectivity (these bats require trees for their sit-and-wait hunting) (Reid and Baker 2025). The same authors also gave the species a relatively high risk score for flight mobility; this scoring could reflect the large size of the bat, but wing morphology data indicates high manoeuvrability for the species (Norberg & Fenton 1988, Crane et al., 2022). Reid and Baker (2025) attributed Low risk scores for flight height (i.e., collision risk), which is consistent with available data derived from GPS tracking for the species (Trainer et al., 2025). Expert elicitation for the DE classifies this species has having medium likelihood of flying above 50 m (Specialised Zoological, 2024), also supporting GPS tracking results for the species (Trainer et al., 2025). No roost structures have been recorded in the DE, and based on call data, no roosts appear likely to occur. Occurrence within the DE is considered low, with a single observation recorded during BBSUS. Ecological and biological information indicates that this species hunts prey using an ambush strategy, with good visual perception, which would limit it flying within the RSA and should enable good perception of turbine blades. HBI (2026b) also consider, based on their review of the available literature, that the species is at low risk of collision.

Despite these low inherent collision risk classifications for these bat species, mitigation has been outlined within the BBAMP to ensure this risk assessment is accurate and a negligible potential for impacts remain. These measures include visual and acoustic deterrents; curtailment protocols; lighting controls; carrion removal; and a carcass search programme.

8.7.1.3 Increased Risk of Vehicle Strike

During the construction phase, vehicle movements will increase throughout the DE associated with the transit of personnel, increasing the risk of vehicle strikes within the area. This risk will be reduced during the operational phase, though a camp of up to 100 personnel will be established for maintenance and operational activities. In addition, there is risk of mortality caused by heavy plant and machinery during clearing activities (for example collision with dozers as they clear).

The risk of vehicle strike will remain throughout the construction phase and this impact would be similar for all diurnal species likely to occur in the DE (some of the Threatened and Migratory species discussed in this report). However, for those that are predominantly nocturnal, including the Night Parrot, Northern Quoll, PLNB, Ghost Bat, and most of the Priority fauna considered, there would be a relatively lower risk of collision with construction or operational vehicles given the anticipated substantial reduction in site activity during the night when these species are most active.

Collision with vehicles could lead to injury or mortality of fauna species. However, with implementation of the standard mitigation measures as outlined in Section 8.6, the anticipated collision numbers would be low. Therefore, the potential collision impacts are not considered to be significant for any of the species identified.

8.7.2 Indirect Impacts

8.7.2.1 Habitat degradation from indirect impacts on vegetation health

The proposal has the potential to result in indirect impacts to native vegetation within and in close proximity to the IDF. Indirect impacts may arise through changes to environmental processes such as altered surface water or groundwater regimes, dust deposition, soil disturbance, weed introduction, and increased edge effects. These mechanisms may place chronic stress on retained vegetation, leading to a gradual decline in vegetation health and condition over time. A reduction in vegetation condition can cause habitat degradation through loss of structural complexity and ecological function, including reduced availability of foraging, shelter, and breeding resources for fauna. Accordingly, indirect impacts to vegetation health require consideration in assessing the significance of impacts to terrestrial fauna values.

As discussed in Section 7.7.2, indirect impacts on vegetation as a result of the Proposal are not anticipated to be significant for any of the environmental values assessed and therefore no significant impacts on vegetation health will occur. As such, the potential for habitat degradation as a result of changes in vegetation health is considered to be negligible. Potential for indirect impacts on fauna and fauna habitat are discussed in in further detail in Sections 8.7.2.2 to 8.7.2.8.

8.7.2.2 Habitat Fragmentation and Proposal Infrastructure Acting as a Barrier to Fauna Movement

Many species in the Pilbara are adapted to specific habitats, the clearing of which can threaten their survival. Habitat fragmentation may occur due to permanent clearing associated with the Proposal, specifically with relation to the development of new roads and access tracks within the IDF. The Proposal, including wind turbine locations, also poses a potential impact on loss of fauna habitat and fragmentation through the creation of a physical barrier (Dai *et al*., 2015) and the associated avoidance behaviour of some species. This is especially the case for birds and bats, which avoid flying between blades, but also non-flying wildlife, which may forage or transit within the habitat between the infrastructure (Barre *et al*., 2018, Marques *et al*., 2019).

Clearing of habitat for the Proposal may cause barriers to fauna movement for the Threatened and Priority Species likely to occur in the DE, particularly those species with lower mobility such as small mammals like the Western Pebble-mound Mouse, Long-tailed Dunnart and the Northern Short-tailed Mouse. This can cause individuals in a population to become isolated from one another or prevent individuals from moving from their nesting or denning habitat to areas where they may forage. However, given the majority of the DE will remain undisturbed; the access roads are proposed to be up to 8 m wide; the turbine structures will be widely spaced with up to 2 km between each turbine and a minimum of 600 m, and the electrical reticulation will not prevent the movement of fauna underneath, it is likely that clearing for the Proposal and the placement of infrastructure will not cause a barrier to species movement within their home ranges. In addition, large areas of undisturbed habitat will remain intact within the DE and surrounding area post-disturbance and populations in these areas will not be impacted.

For the Migratory bird species likely to occur in the DE, fragmentation is generally not considered to be a significant issue given they can easily traverse from one area to another, unless the clearing creates a sufficient barrier that they cannot fly over. As discussed above, the proposed clearing will be dispersed over a large area and will be relatively narrow associated primarily with the access roads and turbine pads, and is therefore not anticipated

to result in significant fragmentation impacts or act as a substantial barrier for these species (collision impact has been discussed in Section 8.7.1.2).

Through an iterative assessment process and implementation of the mitigation hierarchy, the design has been refined to half the number of turbines and the IDF from the original proposal, to avoid areas that may support significant biodiversity values. Fauna habitat exclusion zones have also been incorporated around critical fauna habitats with a commitment of minimal disturbance. These exclusion zones will help to minimise clearing and associated fragmentation impacts around mapped fauna habitat.

Following construction, the rehabilitation of cleared areas can help to reduce any potential fragmentation or barrier impacts, which is discussed further in Section 8.6.

8.7.2.3 Increasing Access and Attraction of Scavenger and Feral Animals

Given the nature of the DE and surrounding area (open expanse), it is considered that the Proposal will not significantly increase accessibility to the area for feral animals due to the openness of the current landscape and existing presence of feral animals in the area. Therefore, no significant impacts on fauna are anticipated with respect to increasing access to the DE for feral animals.

Additionally, the Proposal will have an associated camp to accommodate up to 1,000 personnel during construction, and up to 100 personnel during operational activities. Waste disposal facilities associated with the camp can attract scavenging and feral fauna species if they are not appropriately managed. The presence of animal carcasses resulting from roadkill or collision with infrastructure can also act as an attractance for scavengers and feral fauna. This can result in increased pressure on the surrounding populations of native fauna species, including increased predation of Threatened and Migratory species by attracted introduced animals. Therefore, mitigation measures have been set out in Section 8.6, including the preparation of an EMP to outline how the environmental impacts of the Proposal will be monitored, reported and managed and includes measures to minimise this risk as far as practical (Appendix B).

8.7.2.4 Introduction and/or Spread of Weeds

The Proposal includes construction of approximately 300 km of roads for access between infrastructure and the main access via the GNH and Fortescue's Rail Maintenance Track. The construction activities can increase the risk of weed introduction through machines and personnel. Weed introduction can also be influenced by edge effects[11] on vegetation, due to clearing activities (Rowley, Edwards & Kelly, 1993).

Clearing for the Proposal will increase movement of vehicles in the DE during construction, including earth moving machinery which could result in the establishment of new populations of weed species. Areas of dense weed infestation can reduce the ability of fauna to traverse through their associated habitat and impact on their ability to forage (Stewart *et al*., 2021). In addition, weed species that are palatable to feral herbivores can cause an increase of these animals within the area thereby causing potential land degradation and further spreading of weed species either by movement of soil or in the animal's dung (Hartley *et al*., 2022; Norris

[11] Edge effects can occur at the boundary between cleared areas and the remaining vegetation, including effects associated with increased sunlight and wind; changes in plant and animal communities supported; increased risk of invasive species; or changes in soil composition and water runoff patterns.

& Low, 2005). Increased numbers of weeds can also significantly increase the risk of fire, which can impact on fauna habitat value (see Section 8.7.2.8).

As discussed in Section 8.4.2.1, according to the Recovery Plans for the Northern Quoll, weed infestation is one of the key threats to this species and therefore may be at elevated levels of risk with regard to this potential impact. However, given the effects of weed impacts on fauna habitat previously mentioned, the other ground dwelling species could also be impacted.

Comprehensive weed hygiene management will be enforced during construction and operation to maintain the quality of habitats, as detailed in Section 8.6. This includes an EMP that has been prepared to outline how the environmental impacts of the Proposal will be monitored, reported and managed and includes measures to minimise this risk as far as practical (Appendix B).With these measures in place, any risk of spreading weeds can be appropriately managed such that no significant impacts are anticipated.

8.7.2.5 Disrupted Behaviour of Nocturnal Fauna due to Artificial Light

Artificial light can impact Migratory and/or nocturnal Threatened species by changing predator and prey dynamics and movement, interfering with navigation, and impacting the physiology of circadian rhythm and reproduction (Biodiversity Council, 2023).

The construction of the Proposal will involve the use of artificial light to illuminate specific working areas throughout the DE, although the majority of the works are anticipated to occur during daylight hours which will reduce the need for substantial areas of artificial lighting. During operations, artificial light may be used for safety purposes and within facilities such as the maintenance staff camp.

Altered ambient lighting and increased artificial light may cause behavioural changes to all the Threatened, Priority and Migratory species likely to occur within the DE. The artificial light can cause changes to invertebrate behaviours, such as increased concentrations of individuals around heat and light sources, consequently causing changes to the behaviour of species that predate on the insects, in particular the Northern Quoll, Ghost Bat and PLNB.

Further, the predominantly nocturnal species likely to occur in the DE, including the Night Parrot, Northern Quoll, PLNB, Ghost Bat, and most of the Priority fauna considered, would be at increased risk of impacts due to their increased activity during the darker periods when artificial light is more likely to be required. Conversely, diurnal species such as the Grey Falcon would be impacted to a lesser extent.

To minimise the potential impacts of artificial light on fauna in the surrounding area, mitigation measures have been proposed and are presented in Section 8.6, which align with the National Light Pollution Guidelines for Wildlife (DCCEEW, 2023c). Given the extremely low levels of current ambient light sources in the DE, some increases in temporary and permanent lighting will be required and thus there might be minor impacts on fauna in close proximity to the Proposal. However, through the implementation of the mitigation measures outlined in Section 8.6, these impacts will be minimised such that the Proposal is unlikely to have a significant residual impact with regard to light impacts on fauna during construction or operation.

8.7.2.6 Disturbance from Noise and Vibration

Noise and vibration increases will occur mainly due to construction activities and will then decrease, though remaining slightly higher than baseline levels during the operational phase of the Proposal.

During the construction phase, noise and vibration are expected from the operation of construction plant and machinery, earthworks and general ground disturbing activities. It is not anticipated that a significant amount of blasting will take place.

During the operational activities, noise and vibration will occur as a constant, but with low intensity. The noise impacts of wind farms can be distinguished between two types: mechanical noise and aerodynamic noise. Overall, mechanical noise is not of high concern since it can be minimised through soundproofing materials. However, aerodynamic noise due to the wind turbine blades' rotation can affect fauna species (Pinto, Martins & Pereira, 2017) and is more challenging to mitigate. The sound associated with these activities can impact an animal's behaviour (i.e., avoidance, masking) or have physiological effects, reducing their overall survival and fitness (Teff-seker *et al*., 2022). Elevated noise levels can also reduce reproductive success and, in severe cases, lead to complete abandonment of an area, such as caves.

Noise attributable to the Proposal above baseline levels may impact sensitive species, such as the Ghost Bat and PLNB, as mammals with superior hearing capabilities (Bat call, 2021a), as well as potentially causing changes to the fauna assemblage within habitats in close proximity to the construction areas. According to the Noise Assessment undertaken for the Proposal (Talis, 2024), the highest sound power levels will be experienced during the construction phase. Sound power levels of up to 117 dB may be generated by various types of equipment such as haul trucks, loaders/excavators, dozers, drill rigs and service trucks, which have the potential to temporarily impact Ghost Bat or PLNB nocturnal roost caves if present. As no roosts have been identified during the field surveys, no impacts from noise on these two species are anticipated.

The loudest construction activities would predominantly occur during the day when construction activity is generally higher, and therefore nocturnal species would be at a lower risk of impact given their reduced activity during the day. Operational noise is anticipated to be greatest around the immediate vicinity of the wind turbines with existing noise levels within the DE ranging from 19-57 dB(A) (Talis 2025). During higher windspeeds (when wind turbines would be the noisiest) localised noise generated by the wind as it moves through foliage will increase. As a result, background noise will be higher and potentially mask operational noise Operational noise is not anticipated to exceed the noise level ranges recorded during baseline monitoring (Talis 2025). Overtime fauna are likely to habituate to continuous sound levels over time.

With regards to potential vibration impacts from operation of the Proposal, the source of vibrations in wind farms is the rotating parts of the turbines, such as rotor blades and generators. The rotation of these parts generates periodic vibrations that are transmitted to the ground via the foundations of the wind farm (Bosnjakovic *et al.*, 2024). These vibrations could impact ground dwelling fauna in the surrounding area, especially on their sensitive acoustic perception. However, studies have shown that, in most cases, wind farms had no significant effect on ground-dwelling animals (de Lucas *et al.*, 2005, Walter *et al.*, 2006, Helldin *et al.*, 2012, Łopucki and Mróz, 2016, Łopucki *et al.*, 2018). Therefore, it is considered that any potential vibration impacts would be localised and given the surrounding availability of similar habitats in the wider area, operational vibration impacts from the Proposal are unlikely to result in a significant impact to the conservation significant fauna species within the DE.

Standard construction noise management measures will be implemented, as set out in Section 8.6, which will reduce the construction noise as far as reasonably practicable. Additionally, it is expected that the increase in noise will naturally dissipate to imperceptible levels with

relatively short distances from the source (Talis, 2024). Given the extensive surrounding habitat that the fauna species can utilise, significant noise impacts are not anticipated for any of the species during construction. As operational noise levels would only increase in the immediate vicinity of the Proposal, significant impacts to fauna are not anticipated. Therefore, no specific mitigation measures are proposed.

8.7.2.7 Alteration or Creation of Microclimates

Wind farms have the potential to influence local and regional climates due to their modification of surface-atmosphere exchanges and the transfer of energy, momentum, mass, and moisture within the atmosphere (Zhou *et al*., 2012). The land in and around the wind farm infrastructure can experience related temperature changes. Some studies have shown evidence of cooling during the day and warming temperatures during the night (Qin *et al*., 2022). These differences in temperature can alter vegetation cover (Qin *et al*., 2022) and consequently impact fauna habitat.

The exact mechanisms underlying these microclimate effects are not fully understood, however they arise from changes in local temperature, moisture and CO_2 levels due to vertical mixing, turbulence, and wakes created by wind turbines that extend well-beyond their local footprint (in the order of 10 km or more) (Fitch *et al*., 2013a, Lundquist *et al*., 2019). Given climate variables such as temperature and precipitation affect vegetation, in terms of plant growth and species composition, and habitat values, these microclimate effects created by wind farms in turn could impact the Threatened, Priority and Migratory species likely to occur within the DE by influencing the habitat and food sources for these species.

Without further data on the effects of wind turbines in this specific area of the Pilbara region, a worst-case approach has been taken assuming that implementation of the Proposal would alter local wind patterns by increasing wind speed and changing wind direction around the turbines, which would affect the distribution of heat and moisture in the area. It has also been assumed that the presence of the wind turbines would lead to slight increases in surface temperatures, particularly at night (Kaffine, 2019). This can occur due to the mixing of air layers caused by the turbine blades, which can bring warmer air down to the surface. Even in this scenario, given the low abundance of species likely to occur within the DE and surrounding region (Section 8.7.1), it is considered any localised impacts from alteration of microclimates would not significantly impact the vegetation and habitat composition in the wider area, and therefore would not be likely to impact these populations.

The species recorded in the DE are well adapted to the extreme hot summers and low or occasionally variable rainfall events associated with the existing Pilbara climate, therefore any slight increases in temperature or rainfall events would not be likely to cause significant impact to the fauna species present within the DE. Given the wide spacing distances between each of the turbines, any local microclimate changes are not considered significant with regard to fauna behaviour impacts.

As no significant impacts are anticipated with regard to alteration or creation of microclimates, no specific mitigation measures are proposed. However, the BBAMP incorporates monitoring measures designed to monitor the frequency of bird and bat mortality associated with the Proposal. Additional measures may be implemented following the investigation of triggers being reached or exceeded and inform appropriate responses or extension of the program's implementation. Through ongoing monitoring of impact trigger levels detailed in the BBAMP (Appendix I), and implementation of adaptive management, significant impacts to avifauna species are not anticipated.

8.7.2.8 Increased Risk of Bushfires

The Pilbara region bushfire season occurs from September to November, during the dry season (BoM, 2025). Most fire causes in the region are due to natural events, such as lightning strikes. However, a significant proportion of events have unknown or accidental causes. Comparatively, prescribed burns represent the smallest cause (Bryant, 2008)

According to the DBCA Fire History (DBCA, 2024c), over 75% of the DE has been impacted by fire between 2006 and 2024, equating to over 68,800 ha. The largest recorded recent fires within the DE occurred in 2019, impacting 25,900.49 ha (28.79%) of the DE. From 2020 to 2024, smaller, scattered fires impacted 7,888.47 ha (8.77%) of the DE. Prior to 2019, the most expansive fire events occurred in 2015 and 2016, impacting 14.66% and 10.32% of land within the DE respectively (ecologia, 2025b).

Wind turbines pose a risk of fire incidents, mostly associated with lightning strikes (by acting as conductors) and mechanical failures, often exacerbated by the presence of combustible material (You *et al*., 2023). Similarly, electrical reticulation can cause wildfires through failures, pole top or transformer fires and also experience outages from wildfires (Panossian and Elgindy, 2023). Bushfires can have a detrimental effect on fauna habitat and lead to direct mortality of fauna.

Climate projections for northern Australian Rangelands, including the Pilbara, are that temperatures will continue to rise. By 2030, the mean annual warming across all emissions scenarios is projected to be about 0.6 to 1.4 °C above the climate of 1986–2005. By 2090, temperatures are projected to be 1.5 to 2.9 °C warmer under an intermediate emissions scenario (RCP 4.5) (DWER, 2021). A substantial increase in the temperature reached on the hottest days and the frequency of hot days is projected. Given these projections, it is anticipated that the bushfire risk and intensity of events will increase in response to the changing climate, which could further exacerbate the risks associated with the Proposal, thus impacting on fauna habitats.

It should be noted that due to the extensive recent fire history throughout the DE, the potential fuel load for bushfires is substantially reduced, which lowers the risk of further bushfires occurring within the DE.

Fire risk will be managed in accordance with Fortescue standard control measures, which aim to minimise risks as far as practical, as set out in Section 8.6, and is therefore not expected to pose a significant risk to fauna habitat or any of the Threatened, Priority or Migratory species considered.

8.7.3 Cumulative Impacts

Cumulative environmental impacts are the successive, incremental, and interactive impacts on the environment of a proposal with one or more past, present and reasonably foreseeable future activities (EPA, 2021). This section outlines the potential cumulative impacts to terrestrial fauna as a result of the Proposal and other surrounding developments either recently approved or currently under assessment.

In undertaking a cumulative impact assessment, the following assumptions are noted:

- Cumulative impacts resulting from third-party operations are based on information available in the public domain for third party operators and does not encapsulate impacts for all third-party operations in the region,

- Cumulative impact calculations generally do not take into consideration areas outside of those assessed under Part IV of the EP Act, or EPBC Act referrals, for each relevant proposal. Where relevant, large clearing permits under Part V of the EP Act may also be included depending on the quantity and quality of information available, and

- The accuracy of data from external sources will not be verified and it is assumed that data publicly available is accurate and collected in accordance with standard industry guidelines.

With regard to cumulative impacts on terrestrial fauna, the impacts assessment boundary should take account of the local population (as defined by Conservation Advice/Recovery Plan where relevant). For restricted species, this may be the same as the defined extent of occurrence or area of occupancy for that species. Similar projects within the same IBRA sub-region/s should also be considered, using land systems as surrogate for habitat overlayed with known range/records of occurrence for the species.

For the assessment of cumulative impacts to conservation fauna species, the projects were selected based on the following criteria:

- Proposals assessed and submitted between 2019 and 2026 (assumed to be 'reasonably foreseeable future activities' as proposals would generally be conditioned to commence implementation within five years of approval and are otherwise anticipated to be included in the existing environment data),

- Proposals within the Chichester subregion, and adjacent Fortescue subregion (due to similarities in habitat types and transient nature of fauna species), that generally intersect with similar dominant land systems to the Proposal IDF (including Mckay Land System; Wona Land System; Robe Land System; and Bonney Land System), and

- Proposals that haven’t started pre-construction activities yet.

There are several reasonably foreseeable developments within the Proposal region and, more broadly, within the Chichester and Fortescue subregions of the Pilbara bioregion. Although not directly comparable proposals, they do involve habitat removal, and therefore the projects in the Chichester and Fortescue subregions, and generally with similar dominant land systems, have been considered in this cumulative impact assessment. This includes:

- Nullagine Pilot Wind Farm Project,

- East Hamersley Railway Project,

- Hemi Gold Project,

- Jimblebar Hub Significant Amendment,

- McPhee Creek Iron Ore Project,

- Mulga Downs Hub and Rail Spur,

- North Star Magnetite Project Extension,

- Nyidinghu Iron Ore Mine,
- Ridley Magnetite Project, and
- Sulphur Springs Zinc-Copper Project.

The cumulative impacts to Terrestrial Fauna habitats anticipated to occur as a result of this Proposal in combination with the projects identified above are summarised in Table 8-32. Some important environmental features such as roost caves and pools are not considered in the cumulative impact assessment as the Proposal has been designed to avoid direct impacts to these features are therefore not impacted as a result of the Proposal. In line with the commitments outlined in the BBAMP (Appendix I), adaptive management will be implemented for the Proposal at turbines found to be of higher collision risk to ensure that important flightpaths are not significantly impacted, and thereby avoiding potential for cumulative impacts of wind turbines occupying important flightpaths between roosting and foraging sites.

Table 8-32: Impacts Associated with Other Surrounding Projects

The Proposal and cumulative projects	Reported direct impacts	
	Habitat removal	**Significant species impacted**
The Proposal	Removal of 910.26 ha of terrestrial fauna habitat, including: • Drainage line/river/creek (major) – 1.42 ha, • Drainage line/river/creek (minor) – 2.50 ha, • Granite outcrops (flat dome) – 0.39 ha, • Plain (cracking clays) – 87.19 ha, • Plain (stony/gibber) – 786.80 ha, • Rocky escarpments (ridges/mesa/cliffs/outcrops/breakaways) – 26.40 ha, and • Woodland (open) – 5.56 ha.	**Clearing of critical habitat for:** • Grey Falcon – 1.42 ha, • Northern Quoll – 14.96 ha, • PLNB – 27.82 ha, • Ghost Bat – 27.82 ha, • Night Parrot – 281.81 ha, • Peregrine Falcon – 27.82 ha, and • Pilbara Olive Python – 27.82 ha.
Nullagine Pilot Wind Farm	Removal of 297.21 ha of terrestrial fauna habitat, including: • Drainage line/river/creek (major) – 0.34 ha, • Drainage line/river/creek (minor) – 10.47 ha, • Plain (stony/gibber) – 282.55 ha, and • Rocky escarpments (ridges/mesa/cliffs/outcrops/breakaways) – 0.01 ha.	**Clearing of critical habitat for:** • Northern Quoll – 0.35 ha, • PLNB – 0.35 ha, • Grey Falcon– 0.34 ha, and • Ghost Bat – 0.35 ha.
East Hamersley Railway Project*	Removal of 4,387 ha of terrestrial fauna habitat, including those similar to the proposal*: • Woodland (open/closed) – 12,057.12 ha, • Drainage line/river/creek (minor) – 3,073.57 ha, • Plain (stony/gibber) – 404.08 ha, • Drainage line/river/creek (major) – 389.73 ha, and • Rocky escarpments (ridges/mesa/cliffs/outcrops/breakaways) – 116.72 ha.	**Clearing of critical habitat for:** • Northern Quoll – 116.72 ha, • PLNB – 506.45 ha, • Ghost Bat – 506.45 ha, • Night Parrot – 404.08 ha, • Pilbara Olive Python – 506.45 ha, • Grey Falcon – 389.73 ha, and • Peregrine Falcon – 389.73 ha.
Hemi Gold Project	Removal of 5,978 ha of terrestrial fauna habitat, including those similar to the proposal: • Woodland (open) – 5,100 ha, and	**Clearing of critical habitat for:** • Northern Quoll – up to 45.00 ha, • PLNB – 45.00 ha,

The Proposal and cumulative projects	Reported direct impacts	
	Habitat removal	**Significant species impacted**
	• Drainage line/river/creek (major) – 45 ha.	• Ghost Bat – 45.00 ha, • Pilbara Olive Python – 45.00 ha, and • Grey Falcon – 45.00 ha.
Jimblebar Hub	Removal of 1,574.1 ha of terrestrial fauna habitat, including those similar to the proposal: • Rocky escarpments (ridges/mesa/cliffs/outcrops/breakaways) – 2.5 ha, • Drainage line/river/creek (major) – 15.9 ha, • Drainage line/river/creek (minor) – 24.7 ha, and • Plain (stony/gibber) – 16.9 ha.	**Clearing of critical habitat for:** • Northern Quoll – 2.5 ha, • PLNB – 18.40 ha, • Ghost Bat – 18.40 ha, and • Night Parrot – 16.90 ha.
McPhee Creek Iron Ore Project	Removal of 1,913 ha of terrestrial fauna habitat, including those similar to the proposal: • Drainage line/river/creek (major) – 55 ha, • Woodland (open) – 24.5 ha, and • Rocky escarpment (ridges/mesa/cliffs/outcrops/breakaways) – 17.0 ha.	**Clearing of critical habitat for:** • Northern Quoll - 615.20 ha, • PLNB – 72.00 ha, • Ghost Bat – 72.00 ha • Pilbara Olive Python – 670.20 ha, and • Grey Falcon – 55.00 ha.
Mulga Downs Hub and Rail Spur	Removal of 2,282.88 ha of terrestrial fauna habitat, including those similar to the proposal: • Drainage line/river/creek (major) 77.40 ha, • Woodland (open) – 91.52 ha, • Plain (stony/gibber) – 1,010.14 ha, • Plain (cracking clay) – 189.80 ha, • Drainage line/river/creek (minor) – 56.72 ha, and • Rocky escarpments (ridges/mesa/cliffs/outcrops/breakaways) – 0.47 ha.	**Clearing of critical habitat for:** • Northern Quoll - 48.54 ha, • PLNB – 77.87 ha, • Ghost Bat – 77.87 ha, • Night Parrot – 1, 010.14 ha, and • Pilbara Olive Python – 48.53 ha.
North Star Magnetite Project Extension	Removal of 606.9 ha of terrestrial fauna habitat, including those similar to the proposal: • Drainage line/river/creek (minor) – 6.4 ha, and	**Clearing of critical habitat for:** • Northern Quoll – 36.00 ha,

The Proposal and cumulative projects	Reported direct impacts	
	Habitat removal	**Significant species impacted**
	• Rocky escarpments (ridges/mesa/cliffs/outcrops/breakaways) – 14.9 ha.	• PLNB – 36.00 ha, • Ghost Bat – 14.90 ha, and • Pilbara Olive Python – 69.00 ha.
Nyidinghu Iron Ore Mine	Removal of 12,365 ha of terrestrial fauna habitat, assemblage unknown.	A quantifiable amount of critical habitat to be removed is not available however no significant impacts are reported.
Ridley Magnetite Project	Removal of 8,484 ha of terrestrial fauna habitat, assemblage unknown.	A quantifiable amount of critical habitat to be removed is not available however no significant impacts are reported.
Sulphur Springs Zinc-Cooper Project	Removal of 313.6 ha of terrestrial fauna habitat, including those similar to the proposal: • Drainage line/river/creek (major) – 4.7 ha, • Rocky escarpments (ridges/mesa/cliffs/outcrops/breakaways) – 39.7 ha, and • Plain (stony/gibber) – 38.8 ha.	A quantifiable amount of critical habitat to be removed is not available however no significant impacts are reported.
Native Vegetation Clearing Permits: 9195, 9903, 9910, 10494	Removal of 917.24 ha of terrestrial fauna habitat.	A quantifiable amount of critical habitat to be removed is not available however no significant impacts are reported.
Cumulative Total	**39,081.19 ha of habitat clearance, with some similar habitat types across the project areas, including:** • **Drainage line/river/creek (major) – 589.47 ha,** • **Drainage line/river/creek (minor) – 3,174.36 ha,** • **Granite outcrops (flat dome) – 0.39 ha,** • **Plain (cracking clays) – 276.99 ha,** • **Plain (stony/gibber) – 2,539.27 ha,** • **Rocky escarpments (ridges/mesa/cliffs/outcrops/breakaways) – 217.70 ha, and** • **Woodland (open) – 17,278.70 ha.**	**Clearing of critical habitat for:** • **Northern Quoll – 879.27 ha,** • **PLNB – 762.79 ha,** • **Ghost Bat – 762.79 ha,** • **Night Parrot – 1,712.93 ha,** • **Grey Falcon – 491.49 ha,** • **Peregrine Falcon – 417.55 ha, and** • **Pilbara Olive Python – 1,367.00 ha.**

The Proposal and cumulative projects	Reported direct impacts	
	Habitat removal	Significant species impacted
Cumulative Extent of Habitats	**The total mapped habitat extents from each of the cumulative projects include:** • **Drainage line/river/creek (major) – 6,060 ha,** • **Drainage line/river/creek (minor) – 15,190 ha,** • **Granite outcrops (flat dome) – 12 ha,** • **Plain (cracking clays) – 6,936 ha,** • **Plain (stony/gibber) – 88,695 ha,** • **Rocky escarpments (ridges/mesa/cliffs/outcrops/breakaways) – 3,944 ha, and** • **Woodland (open) – 107,368 ha.**	**The total mapped habitat extent of critical habitat from each of the cumulative projects includes:** • **Northern Quoll – 6,584 ha,** • **PLNB – 11,475 ha,** • **Ghost Bat – 11,474 ha,** • **Night Parrot – 32,906 ha,** • **Grey Falcon – 4,507 ha,** • **Peregrine Falcon – 5,398 ha, and** • **Pilbara Olive Python – 10,330 ha.**
% Cumulative Impacts	**The percentage of cumulative impact of the mapped extent includes:** • **Drainage line/river/creek (major) – 10%,** • **Drainage line/river/creek (minor) – 21%,** • **Granite outcrops (flat dome) – 3%,** • **Plain (cracking clays) – 4%,** • **Plain (stony/gibber) – 3%,** • **Rocky escarpments (ridges/mesa/cliffs/outcrops/breakaways) – 6%, and** • **Woodland (open) – 16%.**	**The percentage of cumulative impact of the mapped extent includes:** • **Northern Quoll – 13%,** • **PLNB – 7%,** • **Ghost Bat – 7%,** • **Night Parrot – 5%,** • **Grey Falcon – 11%,** • **Peregrine Falcon – 8%, and** • **Pilbara Olive Python – 13%.**

*The fauna habitat values for the East Hamersley Railway Project are for the Development Envelope for the Project. The Proposal is still being assessed and a clearing footprint has not been defined, therefore the areas included in Table 8-32 are considered conservative and are likely greater than the amount to be cleared for the project.

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A summary of the cumulative assessment detailed in Table 8-32, for each of the relevant significant species, is provided below. Only those species for which cumulative impacts have been identified are discussed (i.e. where one or more of the identified cumulative projects impacts similar important habitats to the Proposal).

Northern Quoll

The cumulative assessment for Northern Quoll critical habitat identified a combined total of 879.27 ha of clearing. Clearing associated with the Proposal represents 2% of this total. The total cumulative clearing represents 13% of the mapped extents across the survey areas associated with the cumulative projects. However, Northern Quoll critical habitat occurs within 12 land systems within the Fortescue and Chichester subregions and is more widely represented outside of these survey areas. The cumulative critical habitat clearing represents 0.02% of these land systems within the Fortescue and Chichester subregions.

Ghost Bat and PLNB

The cumulative assessment for Ghost Bat and PLNB critical habitat identified a combined total of 762.79 ha of clearing. Clearing associated with the Proposal represents 4% of this total. The total cumulative clearing represents 7% of the mapped extents across the survey areas associated with the cumulative projects. However, Ghost Bat and PLNB critical habitat occurs within 14 land systems within the Fortescue and Chichester subregions. The cumulative critical habitat clearing represents 0.01% of these land systems within the Fortescue and Chichester subregion.

Night Parrot

The cumulative assessment for Night Parrot critical habitat identified a combined total of 1,712.93 ha of clearing. Clearing associated with the Proposal represents 16% of this total. The total cumulative clearing represents 5% of the mapped extents across the survey areas associated with the cumulative projects. However, Night Parrot critical habitat occurs within 18 land systems within the Fortescue and Chichester subregions and is more widely represented outside of these survey areas. The cumulative critical habitat clearing represents 0.07% of these land systems within the Fortescue and Chichester subregions.

Grey Falcon

The cumulative assessment for Grey Falcon critical habitat identified a combined total of 491.49 ha of clearing. Clearing associated with the Proposal represents 0.3% this total. The total cumulative clearing represents 11% of the mapped extents across the survey areas associated with the cumulative projects. However, critical habitat for the Grey Falcon critical habitat occurs within eight land systems within the Fortescue and Chichester subregions and is more widely represented outside of these survey areas. The cumulative clearing of this habitat represents 0.03% of these land systems in the Fortescue and Chichester subregions.

Peregrine Falcon

The cumulative assessment for Peregrine Falcon critical habitat identified a combined total of 417.55 ha of clearing. Clearing associated with the Proposal represents 7% of this total. The total cumulative clearing represents 8% of the mapped extents across the survey areas associated with the cumulative projects. However, the habitat types critical to the survival for this species are recorded across eight land systems in the Fortescue and Chichester

subregions and is more widely represented outside of these survey areas. The cumulative clearing represents 0.03% of the critical habitat mapped in these land systems within the Fortescue and Chichester subregions.

Pilbara Olive Python

The cumulative impact to Pilbara Olive Python critical habitat is anticipated to be 1,367 ha. Clearing associated with the Proposal represents 2% of this total. The total cumulative clearing represents 13% of the mapped extents across the survey areas associated with the cumulative projects. However, the critical habitat types are recorded across eight land systems in the Fortescue and Chichester subregions and is more widely represented outside of these survey areas. The cumulative clearing represents 0.04% of the land systems where critical habitat for this species occurs within the Fortescue and Chichester subregions.

Given the low proportionate impacts on the critical habitat for the above species within the DE, and the wider habitat available outside of the DE for all species discussed, cumulative impacts from clearing are not expected to be significant.

8.8 Environmental Outcomes

Table 8-33 summarises the expected environmental outcomes for the Proposal, following the implementation of mitigation and management measures. The environmental outcomes proposed are mainly outcome-based conditions. However, environmental objectives are proposed in some cases as there are several factors outside Fortescue's control that will influence an outcome. These cases require an assessment from a subject matter expert to assess whether the objectives are achieved.

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Table 8-33: Summary of Residual Impacts for Terrestrial Fauna after Mitigation Measures

Potential impact	Residual impact after management	Regional significance	Proposed Environmental Outcomes
Loss of fauna habitat	Loss of 910.26 ha of fauna habitat. Rehabilitation post construction will re-establish fauna habitat in some disturbed areas. There will be some permanent loss of habitat for drainage line/river/creek (major), drainage line/river/creek (minor), granite outcrops (flat dome), plain (cracking clays), plain (stony/gibber), rocky escarpments (ridges/mesa/cliffs/outcrops/breakaways), and woodland (open). Critical habitat will be cleared for the Grey Falcon, Northern Quoll, PLNB, Ghost Bat, Night Parrot, Pilbara Olive Python and Peregrine Falcon.	Although there are supporting and critical habitats for the listed fauna species within the IDF, the habitat types are common throughout the local area and wider region. The proportionate impact on the regional habitat availability is negligible for all species. Residual impacts are considered minimal in relation to conservation significant habitat at a regional scale. The clearing of PLNB and Ghost bat critical habitat is considered a potentially significant residual impact that may require offsets. No roosting caves have been identified within the DE. The clearing for Northern Quoll critical habitat will be offset in line with State and Commonwealth offsets policies and requirements, and the remaining residual impacts are not considered significant.	**TF-1 Environmental Outcome:** Disturbance of critical fauna habitat not to exceed: • Clearing of no more than 1.42 ha of habitat identified as being critical to the survival of the Grey Falcon, • Clearing of no more than 14.95 ha of habitat identified as being critical to the survival of the Northern Quoll, • Clearing of no more than 238.24 ha of habitat identified as being critical supporting to the survival of the Northern Quoll, • Clearing of no more than 27.82 ha of habitat identified as being critical to the survival of the Ghost Bat and PLNB, • Clearing of no more than 27.82 ha of critical habitat for the Pilbara Olive Python within the DE will occur, • Clearing of no more than 281.81 ha of habitat identified as being critical to the survival of the Night Parrot, • Clearing of no more than 1.42 ha of potential Australian Painted Snipe and Common Greenshank dispersal and foraging habitat , and • Clearing of no more than 27.82 ha of habitat identified as being critical to the survival of the Peregrine Falcon. **TF-2 Environmental Outcome:** Fauna Habitat Exclusion Zones (FHEZ) have been proposed to minimise impacts on critical fauna habitats and to ensure no disturbance occurs within these areas, these areas include:
Fragmentation of habitat and creating a barrier to fauna movement	Given the linear nature of the Proposal, the infrastructure and associated clearing will fragment some areas of habitat, however the areas of intact habitat will be substantial and the electrical reticulation will not prevent the passage of fauna between units. In addition, following construction, the rehabilitation of cleared areas can help reduce the magnitude of potential fragmentation impacts. Therefore, overall significant impacts as a result of habitat fragmentation or barrier to fauna movement are not anticipated for any of the species considered.	Due to the size of the remaining habitat areas, fragmentation of habitat types within the DE is not expected to be significant.	

Potential impact	Residual impact after management	Regional significance	Proposed Environmental Outcomes
			• FHEZ of 5,894.74 ha of Rocky Escarpment habitat (including 1 km buffer), • FHEZ of 5,441.33 ha of Major Drainage Line/River/Creek habitat (including 500 m buffer, which allows for clearing but no turbines to be installed), and • FHEZ of 1,815.59 ha of Hills/Ranges/Plateaux (including 1 km buffer). **Management of potential impacts from clearing of conservation significant fauna can be regulated under Part V of the EP Act.**
Collision with operational wind turbines	Given the relatively low abundance of the conservation significant species recorded during the surveys, and therefore relatively low mortality rates expected, collision with the operational infrastructure is not expected to result in a significant impact that would affect the majority of species on a population level. The Grey Falcon was observed within the DE flying at heights that intersect with the RSA (ecologia, 2026), therefore there is a residual risk that the Grey Falcon may collide with the operational wind turbines. However, Grey Falcon hunting and breeding activities primarily occur within the Drainage Line/River/Creek habitat types. Many of the Grey Falcon sightings have been recorded within creek lines and rivers or adjacent habitat, with the Bonnie Creek, Nullagine River, Coongan River and associated tributaries providing movement corridors for the species within	Due to the abundance of habitat outside the DE, and the relatively low abundance of conservation significant bird and bat species utilising the DE, impacts from collision are not likely to be significant on a regional scale and are not likely to impact species at a population level. As the total population of the Grey Falcon is estimated to be less than 1,000 mature individuals (Mullin *et al.*, 2020), the risk of an individual mortality may present a potentially significant impact to the species. Both CRMs rated the Grey Falcon of being in danger of losing approximately 2% of the modelled local population each year due to collision with the WTG. This is a relatively low value (estimated 1 bird collision every ~12 years for the adult population of ~2 pairs), and therefore the population is anticipated to maintain sustainable levels..	**TF-3 Environmental Objective:** Implementation of the Bird and Bat Adaptive Management Plan (BBAMP) to monitor and minimise collision risk impacts to species. **Management of potential impacts to collision of avian fauna with wind turbines can be managed by the implementation of a BBAMP under the Mining Act.**

Potential impact	Residual impact after management	Regional significance	Proposed Environmental Outcomes
	the survey area. Therefore, with the substantially reduced number of turbines proposed compared to the original design, and incorporation of fauna habitat avoidance areas around the majority of Drainage Line/River/Creek habitat types, , potential collision risk will be minimised as far as possible.		
Vehicle interactions	There is a residual risk of fauna collision with vehicles associated with construction and operation of the Proposal, however with the implementation of the recommended mitigation measures, such as adherence to strict speed limits on site, impacts are not anticipated to be significant.	No significant impacts are anticipated on a regional scale.	No condition required as no significant impact anticipated
Habitat degradation	With the implementation of the standard mitigation measures, indirect impacts on vegetation as a result of the Proposal are not anticipated to be significant for any of the environmental values assessed. Therefore, the potential for habitat degradation as a result of changes in vegetation health is also not anticipated to be significant.	No significant impacts on vegetation health on a local or regional scale.	No condition required as no significant impact anticipated
Attraction of scavenger's and feral animals	A residual risk will remain, however standard mitigation measures will be implemented to minimise possible introduction or increase of feral animals within the DE, including ensuring appropriate food waste management from site operatives. Consequently, with the appropriate waste control measures in place and education through inductions for all site operatives, the risk of attracting	No significant impacts are anticipated on a regional scale.	As per environmental objective FV-5

Potential impact	Residual impact after management	Regional significance	Proposed Environmental Outcomes
	scavenger's and feral animals is considered to be appropriately managed such that no significant impacts are anticipated.		
Increase risk of weeds introduction	Following implementation of the recommended weed hygiene measures outlined in Section 8.6, the risk of introducing and spreading weeds will be appropriately managed such that no significant impacts are anticipated.	No significant impacts are anticipated on a regional scale.	As per environmental objective FV-5 **Management of potential impacts from weeds can be regulated under the Mining Act.**
Disturbance from noise and vibration and artificial lighting	A residual risk remains for disturbance of fauna from elevated levels of noise or artificial light during the construction phase. Fauna may be attracted to areas where prey such as insects are attracted to the light emissions. Light emissions may also cause other behaviour responses such as changing the timing of fauna individuals' activities or avoidance of the area. Noise is an environmental stressor which has the potential to impact the way fauna interact with their habitats such as avoidance of noisy areas or reduction in foraging success due to masking. However, due to the temporary and localised nature of the construction noise and light emissions, remaining surrounding habitat, these impacts are not expected to be significant. Overall, the potential impacts to terrestrial fauna from construction and operational activities will be controlled through standard best practice construction site management measures, which are listed	No significant impacts are anticipated on a regional scale.	No condition required as no significant impact anticipated. **Management of these potential impacts can be regulated under the Mining Act.**

Potential impact	Residual impact after management	Regional significance	Proposed Environmental Outcomes
	in Section 8.6. As such, no significant impacts to terrestrial fauna from noise, vibration and artificial lighting are expected.		
Alteration or creation of microclimates around turbines	Localised microclimate impacts could occur causing alterations in temperature and moisture levels which could impact the Threatened, Priority and Migratory species that are adapted to specific conditions within the Pilbara. However, given the low abundance of species recorded and extensive surrounding areas of suitable habitat for all the species likely to occur within the DE, it is considered any localised impacts from alteration of microclimates would not be significant at a species or regional level.	No significant impacts are anticipated on a regional scale; however, the BBAMP will monitor and investigate collisions and implement management measures should these be required.	As per environmental objective TF-3
Increased risk of bushfires	Following implementation of the recommended fire risk management measures outlined in Section 8.6, the increased risk of bushfires as a result of the Proposal will be appropriately managed such that no significant impacts are anticipated.	No significant impacts are anticipated on a regional scale.	As per environmental objective FV-5 **Management of potential impacts from bushfires can be regulated under the Mining Act.**

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Following the implementation of the management measures identified above, the clearing of Northern Quoll critical habitat is considered a significant residual impact. Based on the number of individuals identified and frequency of detections during field surveys, the northern half of the DE appears to support a high density, reproductive population of Northern Quolls (ecologia, 2025b). Therefore, habitat in the northern portion of the DE is considered critical habitat for the Northern Quoll (ecologia, 2025b). The Northern Quoll critical habitat required to be cleared is the rocky escarpments (ridges/mesa/cliffs/outcrops/breakaways) (ecologia, 2025b). These residual impacts are considered significant and will require offsetting. Offsets are discussed in further detail in Section 12.

The clearing of PLNB and Ghost Bat critical habitat is considered a potentially significant residual impact. Clearing of potential roosting habitat may limit the ability of the species to inhabit the DE should other habitats surrounding the DE become unsuitable. The PLNB and Ghost Bat critical habitat required to be permanently cleared is the drainage line/river/creek (major) and rocky escarpment (ridges/mesa/cliffs/outcrops/breakaways) habitat types. The hills/ranges/plateaux and gorges/gullies habitat types are also considered critical habitat for the species, however neither of these habitats will be cleared for the Proposal. These residual impacts are considered potentially significant and may require offsetting. Offsets are discussed in further detail in Section 12.The clearing of critical and supporting habitat for the remaining conservation listed species, with potential to occur in the DE (Night Parrot, Pilbara Olive Python, Grey Falcon, and Peregrine Falcon), is not considered to be significant as discussed in Section 8.7.1.1. This is primarily due to the low abundance of records of these species from the fauna surveys within the DE (ecologia, 2025b; ecologia, 2026) and the substantial areas of similar habitat within the surrounding areas that will not be disturbed as a result of the Proposal.

Collision risk with the operational Proposal for avifauna and bats will be minimised as far as possible, however given the Grey Falcon's EPBC listing (Vulnerable) and assumed relatively low abundance, individual mortality of this species could present a potentially significant impact. Other potential direct and indirect impacts to terrestrial fauna associated with the Proposal will not be significant at the local or regional scale as they will be appropriately managed through site-specific mitigation outlined in Section 8.6. Given the relatively small extent of the proposed clearing of habitat types identified as being significant for conservation listed species, this clearing will not result in a significant residual impact.

Through implementation of the proposed environmental outcomes and objectives (Table 8-33), together with the offsetting of significant residual impacts will result in the biological diversity and ecological integrity of the DE being preserved. The Proposal is consistent with the EPA's environmental objective for Terrestrial Fauna.

9 SOCIAL SURROUNDINGS

9.1 EPA Objective

The WA EPA defines this factor as '*social surroundings is a part of the environment that may require consideration' where there is a 'clear link between a proposal or scheme's impact on the physical or biological surroundings and the subsequent impact on a person's aesthetic, cultural, economic or social surroundings*' (EPA, 2023b).

The WA EPA objective for the social surroundings environmental factor is '*To protect social surroundings from significant harm*' (EPA, 2023b).

Aboriginal Cultural Heritage for the Proposal refers to Heritage Places and other cultural values such as culturally significant plants and animals, use of country for traditional activities, and cultural values of waterways.

9.2 Policy and Guidance

The following EPA policies and guidelines have been considered for the Proposal to meet the EPA's objective in relation to this factor:

- Statement of Environmental Principles, Factors and Objectives (EPA, 2023a),
- Environmental Factor Guideline – Social Surroundings (EPA, 2023b), and
- Technical Guidance: EIA of Social Surroundings – Aboriginal Cultural Heritage (EPA, 2023c).

Other policy and guidance relevant to this factor includes:

- Environmental Protection (Noise) Regulations 1997 (Noise Regulations),
- *Aboriginal Heritage Act 1972* (AH Act),
- ICOMOS Burra Charter 2013,
- *Native Title Act 1993*,
- *Aboriginal and Torres Strait Islander Heritage Protection Act 1984,*
- Visual Landscape Planning in Western Australia: a manual for evaluation, assessment, siting and design (Department for Planning and Infrastructure, 2007),
- Planning Bulletin 67 Guidelines for Wind Farm Development (WAPC, 2004),
- State Planning Policy No 2 Environment and Natural Resources (WAPC, 2003),
- Environmental, health, and safety guidelines for wind energy (World Bank Group, 2015),
- Aboriginal Heritage Due Diligence Guidelines (DAA & DPC, 2013), and

- Draft Guideline: Dust Emissions (DWER, 2021e).

9.3 Surveys and Studies

The technical studies relating to Social Surroundings undertaken for the Proposal area described in Table 9-1 and Table 9-2.

It is important to note that since the technical studies were completed, the Proposal has been significantly scaled back, with the number of turbines reduced from 200 to 100 and the IDF area reduced from approximately 2,044 ha to 944.07 ha. As a result, the surveys and assessments referenced below were based on a larger project footprint. Any negative impacts previously identified are therefore likely to be lower than those originally reported.

Table 9-1: Social Surroundings Studies Undertaken for the Proposal

Report/study	Organisation	Scope
Bonney Downs Wind – Project Dust Assessment (2025)	GHD	The dust modelling risk assessment includes the assessment of the potential direct and indirect impacts associated with dust from the Proposal's operations, and the risk and management to key sensitive receptors associated with the Proposal. The scope includes, but is not limited to: • A description of the surrounding environment, including sensitive receptors and places, • A description of the potential sources of air emissions that may be generated during construction and operation of the Proposal, and • Dust modelling to determine impacts during construction and operations phase of the Proposal.
Bonney Downs Wind – Project Noise Assessment (2024a)	Talis consultants	The report assessed and quantified the potential received noise levels during construction and operation phases of the Proposal at sensitive receivers and cultural receptors. The study included an in-field noise demonstration with Palyku traditional owners at Bonnie Pool.
Bonney Downs Fauna Noise Impact Study (2025)	Talis consultants	The report assessed the potential noise impacts from the proposed Bonney Downs Wind Farm on culturally significant fauna, particularly kangaroos, emus, and echidnas. The study quantified received noise levels and evaluated behavioural, communication, and physiological effects. This study addresses Traditional Owner concerns through modelling and a risk-based impact assessment.
Bonney Downs Wind – Construction Vibration Addendum (2024b)	Talis consultants	The report provides an overview of possible vibration impacts from the Proposal and inform any ground-borne vibration risk associated with possible blasting and construction activities.
Visual Impact Assessment Bonney Downs Wind Farm (2024b)	SLR	The report provides an assessment of direct and/or indirect impacts on visual amenities at 13 Points of Interest. To support the VIA, augmented reality was also used to consult with Palyku and Nyiyaparli on potential visual amenity impacts.
Traditional Ecological Knowledge	Terra Rosa Consulting	Traditional Ecological Knowledge (TEK) assessments have commenced within the DE to identify and document plants and animals of traditional use or value to Palyku traditional owners. Cultural associations to ecological features and areas containing culturally significant species will be documented. These assessments were undertaken in consultation with Traditional Owner knowledge holders and nominated representatives.

Report/study	Organisation	Scope
		Nyiyaparli did not raise impacts to TEK values as a concern given the minimal disturbance on their country. Their concerns were around maintaining biodiversity which can be addressed through the Flora and Fauna studies. TEK assessments are still ongoing for the Proposal.
Archaeological Surveys	Terra Rosa Consulting, Echoes, and Coongan	These surveys are undertaken to identify and record archaeological heritage sites (such as artefact scatters, engravings (rock art), and grinding patches) as defined under the AH Act. Archaeological surveys are undertaken in consultation with Palyku and Nyiyaparli knowledge holders for the area. Archaeological survey reports remain the property of the Traditional Owners.
Ethnographic Surveys	Terra Rosa Consulting and Snappy Gum	These surveys are undertaken to identify and record ethnographic heritage sites (such as mythological or ceremonial places, or song lines) as defined under the AH Act. Ethnographic surveys are undertaken in consultation with Palyku and Nyiyaparli knowledge holders for the area. Ethnographic survey reports remain the property of the Traditional Owners.

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Table 9-2: Heritage and Traditional Ecological Knowledge Surveys Undertaken in Relation to the Proposal

Survey ID	Date	Consultancy	Survey Type	Key Outcomes	Report Reference
Palyku					
2022_PAL_Trip4	1 – 2 July 2022	Terra Rosa Consulting	Ethnographic and Archaeological	[redacted]	Terra Rosa, A. Morison, A. Reynolds July 2022, PA
2023_PAL_Trip7	7 – 9 July 2023	Terra Rosa Consulting	Ethnographic and Archaeological		Terra Rosa, D. Lakic, July 2023, Final report
2024_PAL_Trip5	23 May- 3 June 2024	Terra Rosa Consulting	Ethnographic and Archaeological		Terra Rosa, S. Liddelow, June 2024, PA
2024_PAL_Trip10	22 July - August 2024	Terra Rosa Consulting	Ethnographic and Archaeological		Terra Rosa, Lucy Clark, August 2024, PA
2024_PAL_Trip16a	12 – 19 November 2024	Terra Rosa Consulting	Ethnographic and Archaeological		Terra Rosa, D. English & I. Omeri, November 2024 PA
2024_PAL_Trip17r1	25 November – 4 December 2024	Terra Rosa Consulting	Archaeological		Terra Rosa, E. Biggs, December 2024 PA

Survey ID	Date	Consultancy	Survey Type	Key Outcomes	Report Reference
2022_PAL_Trip2	28 – 30 June 2022	Terra Rosa Consulting	Ethnographic	[redacted]	Terra Rosa, A. Morison, A. Reynolds July 2022, PA
2024_PAL_Trip1	22 – 27 February 2024	Terra Rosa Consulting	Ethnographic		Terra Rosa, A. Swenson and M. McElligott, June 2024, Final Report
2024_NYI_Trip12	14 - 23 August 2024	Snappy Gum	Ethnographic and Archaeological		Snappy Gum. A, Millard. October 2024, PA.
2024_PAL_Trip16b	12 – 19 November 2024	Terra Rosa Consulting	Ethnographic		Terra Rosa, D. English & I. Omeri, November 2024 PA

Survey ID	Date	Consultancy	Survey Type	Key Outcomes	Report Reference
Nyiyaparli					
2020_NYI_Trip2	07 – 18 July 2020	Coongan	Archaeological	[redacted]	Coongan, S Keiller, C Sims and J Harris, Aug 2020
2024_NYI_Trip7	19 – 28 June 2024	Echoes	Archaeological		Echoes. P, Ryan. July 2024, PA.; Echoes. C, Callaway., P, Ryan. August 2024, Report
2024_NYI_Trip10	15 – 22 Aug 2024	Coongan	Archaeological		Coongan. A, Cooper., T, Wilce., N, Charlwood. September 2024, PA.
2024_NYI_Trip12	9 – 18 Oct 2024	Snappy Gum	Ethnographic		Snappy Gum, A Millard, K Cue, Oct 2024 PA.
2025_NYI_Trip2	12 – 21 Mar 2025	Coongan	Archaeological		Coongan, L Ashworth, March 2025 PA

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Fortescue has engaged with PJAC and KNAC to facilitate heritage surveys, TEK surveys (where required), and on-Country social surrounds consultation to understand the social, cultural, and heritage values within, and surrounding the DE.

Heritage and TEK surveys are still ongoing in collaboration with the relevant Native Title groups. Results of these surveys will be taken into consideration for this Proposal.

9.4 Receiving Environment

9.4.1 Native Title

Most of the DE is located within the Palyku Part A native title determination area (WCD2019/002) and is the traditional lands of the Palyku People (Palyku). A small section of the DE intersects with the Nyiyaparli and Nyiyaparli #3 native title determination area (WCD2018/008) and is the traditional lands of the Nyiyaparli People (Nyiyaparli). The registered native title body corporate (RNTBC) representing the Palyku People is the PJAC and the RNTBC for the Nyiyaparli People is KNAC.

Fortescue has and will continue to engage with Palyku and Nyiyaparli native title stakeholders through the relevant RNTBCs regarding the development of the Proposal. Early engagement was undertaken with Palyku and Nyiyaparli to ensure collaborative planning and key concerns regarding potential impacts to cultural values were considered in the design and management of the Project.

9.4.2 Aboriginal Cultural Heritage

9.4.2.1 Cultural Values Management Framework

Fortescue has developed a framework for managing the cultural values of relevant Native Title stakeholders through informed consultation and the development of appropriate management strategies. The purpose of this framework is to ensure adequate baseline data, assessments, and consultation is undertaken to inform impact assessments and the development of Cultural Management Plans (CMPs) (and other relevant management plans) that may be required.

This framework has been developed to ensure compliance with all relevant environmental and heritage legislation (Commonwealth and State). In addition to these legislations, relevant charters and guidelines were also considered in developing this framework.

The underlying principles of Fortescue's Cultural Values Management Framework are to:

1. Identify the cultural values to Native Title holders within and surrounding a Project or development area (the Project)

2. Identify the potential risks and / or threats to those values that may result from Fortescue's activities

3. Undertake the relevant studies / investigations to determine the level of impact (direct, indirect, and cumulative) to those values and assess the significance of that impact

4. Develop appropriate management strategies to avoid or minimise impacts to those values within high-risk areas

5. Establish an ongoing consultation framework for the implementation and review of cultural heritage management strategies in relation to the Project.

To provide guidance on when the required baseline data and assessments should be undertaken or when key consultation should occur to inform studies and assessments, a staged approach has been developed for Fortescue's Social Surrounds Consultation process. A staged approach ensures adequate data and inputs are collected at key points in the process to inform approval submissions, develop management strategies, and reduce impacts on Project schedules where possible. Consultation undertaken for the Proposal with Traditional Owners has been undertaken in line with this framework.

9.4.2.2 Social Surrounds Consultation

Consultation with the Palyku and Nyiyaparli native title stakeholders was facilitated through their representative bodies, PJAC and KNAC. Consultation on the Proposal commenced in early 2023 where the Fortescue decarbonisation strategy and Proposal concept was first introduced at PJAC and KNAC board meetings. A summary of consultation with native title stakeholders in relation to the Proposal is provided in Table 4-2.

Since then, Fortescue has engaged PJAC and KNAC to facilitate heritage surveys and TEK surveys (outlined in Table 9-2), and on-country social surrounds consultation (outlined in Table 9-3) to understand the social, cultural, and heritage values within, and surrounding the DE.

The social, cultural, and heritage values identified during social surrounds consultation trips and heritage surveys are described in Sections 9.4.2.3 to 9.4.2.7.

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Table 9-3: Summary of On-Country Social Surrounds Consult Trips

Consultation Trip	Summary of Consultation
Palyku	
Social Surrounds Consult Trip 1	**Date of consultation trip:** 24 – 28 June 2024. **Purpose of consultation trip:** Discuss and introduce the Proposal and identify key environmental features / attributes of social, cultural, or heritage value important to Palyku in the area that may be impacted by the Proposal and understand any concerns held by Palyku regarding the Proposal. Field visits were undertaken at the direction of Palyku and included helicopter flights over the proposed turbine, transmission line and associate infrastructure footprint; a visit the Nullagine Iron Ore Project; a visit to Bonnie Pool; and driving the alignment of the proposed PTP8 transmission line following Nullagine Mine Haul Road to Palyku's native title boundary. **Outcomes of consultation trip:** During the trip, Palyku raised concerns about potential visual impacts of the wind turbines on the cultural landscape for Palyku and other groups who live locally and travel along Marble Bar Road to and from Nullagine. Concerns regarding potential impacts to water ways and catchment flows, groundwater levels and quality, and impacts to birds' flight patterns were also discussed. Palyku consider the wind project will have significant impact on the cultural values of Bonnie Pool, mesas and other places of significance in the cultural landscape. As a result of the social surrounds trip, Palyku requested: • Subsequent on-country consultation between PJAC Board and Elders (where possible) • Fortescue to consider the use of augmented reality to consult on potential visual impacts • Continued access to Bonnie Pool and Fortescue to maintain an access road to the pool • Avoid crossing creeks if possible, otherwise design the project to minimise the number of creek crossings
Social Surrounds Consult Trip 2	**Date of consultation trip:** 31 – 3 April 2025. **Purpose of consultation trip:** The primary purpose of this consult was to present on changes made to the project alignment to address concerns / requests made by Palyku during Trip 1 and update Palyku on the outcomes of environmental and social surroundings studies. This consult also informed Palyku of the proposed management strategies that will be considered in the ERD. Field visits were undertaken at several locations to discuss proposed creek crossings, view the augmented reality images, and hear the noise demonstration. Locations visited included: • Bonnie creek crossing to further refine Palyku's approach and preference to creek crossings and land clearances. • Bonnie Pool: undertake noise demonstration and present outcomes of the VIA. Fortescue addressed previous concerns raised by Palyku that two turbines were too close to Bonnie Pool and confirmed that these two turbines have been removed.

Consultation Trip	Summary of Consultation
	• VIA locations along haul road from Bonnie Pool / Nullagine Iron Ore Project to Christmas Creek mine, and Bonney Downs Homestead. **Outcomes of consultation trip:**: • Palyku raised concerns about potential loss of access to hunting areas and possible disturbance of traditional food sources (animals) due to noise generated from the wind turbines. • Palyku reiterated their preference to minimise disturbance to water throughout the project area and acknowledged that minimising the number of creek crossings (as requested during Trip 1), would increase the total disturbance footprint, which was acceptable. Key recommendations from Trip 2 included: • Continued consultation between Fortescue, PJAC Board, and representatives, • Fortescue to consider senior members of Palyku to visit a working wind farm, • Completion of TEK surveys, • No transmission poles to be located within creeks and water flows to be as undisturbed as possible, • Creek crossings to be either low level floodways or box style culverts, • Continued access to Bonnie Pool, and • Minimise dust emissions.
Nyiyaparli	
Social Surrounds Consult Trip 1	**Date of consultation trip:** 17 – 18 September 2024. **Purpose of consultation trip:** Discuss and introduce the Proposal and identify key environmental features / attributes of social, cultural, or heritage value important to Nyiyaparli in the area that may be impacted by the Proposal and understand any concerns Nyiyaparli may have regarding the Proposal. This trip included travelling along the proposed transmission line within Nyiyaparli country and visiting several locations along the Marble Bar Road and of importance to Nyiyaparli where the wind turbines may be visible to understand concerns about potential impacts to visual amenity. **Outcomes of consultation trip:** Nyiyaparli representatives requested the proposed transmission line be kept to the west of the existing Nullagine Mine Haul Road within Nyiyaparli country and that surface water flow is maintained. No concerns were raised about noise or dust during construction or operation of the project. However, Nyiyaparli requested notification of any closures of BC Iron Road during construction as they use

Consultation Trip	Summary of Consultation
	this road to access the surrounding area for hunting. Soda Spring was also identified as a location used by Nyiyaparli on occasion for camping and were interested in knowing whether the turbines would be seen from this location. While no specific concerns were raised about potential impacts to culturally significant flora or fauna, Nyiyaparli were interested in receiving the outcomes of environmental surveys for the project area once completed and requested information sheets summarising these surveys to be provided through KNAC.

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Heritage Places

A search of the DPLH Aboriginal Cultural Heritage Inquiry System (ACHIS) was undertaken on 10 April 2025, to identify any Registered Sites and Lodged Places within the DE (DPLH, 2024). A search of ACHIS assists in identifying Heritage Places that may have been identified through heritage surveys conducted by third party proponents, allowing a full understanding of the potential heritage values in the area. The search identified 34 Registered Places and 84 Lodged Places within the DE (Appendix L), which are shown on Figure 9-1. Three of the lodged places are classified as gender restricted (only men) located off the Marble Bar Road and are not intersected by the IDF.

A search of Fortescue's internal heritage database system was also undertaken. Based on surveys completed at the time of writing this report, a total of 158 Heritage Places are located within the DE (Table 9-4).

Table 9-4: Fortescue Heritage Places within the Development Envelope

Number of Sites	Site Type
87	Artefact Scatter
12	Artefact Scatter, Quarry
9	Water Source
8	Artefact Scatter, Water Source
6	Grinding Patch
5	Ethnographic Site
5	Rock Shelter
5	Scar Tree
3	Engraving
2	Camp Site; Engraving; Water Source; Scar Tree; Grinding Patch
2	Ochre Quarry
2	Quarry
2	Rockshelter, Grinding Patch, Ochre Quarry
2	Water Source, engravings
1	Artefact Scatter, Quarry, Water Source
1	Artefact scatter; quarry; grinding
1	Artefact Scatter; Rock Shelter
1	Ethnographic Site, Water Source
1	Named Place
1	Rock shelter, artefact scatter
1	Rockshelter, Scarred Tree
1	Scar Tree; Water Source

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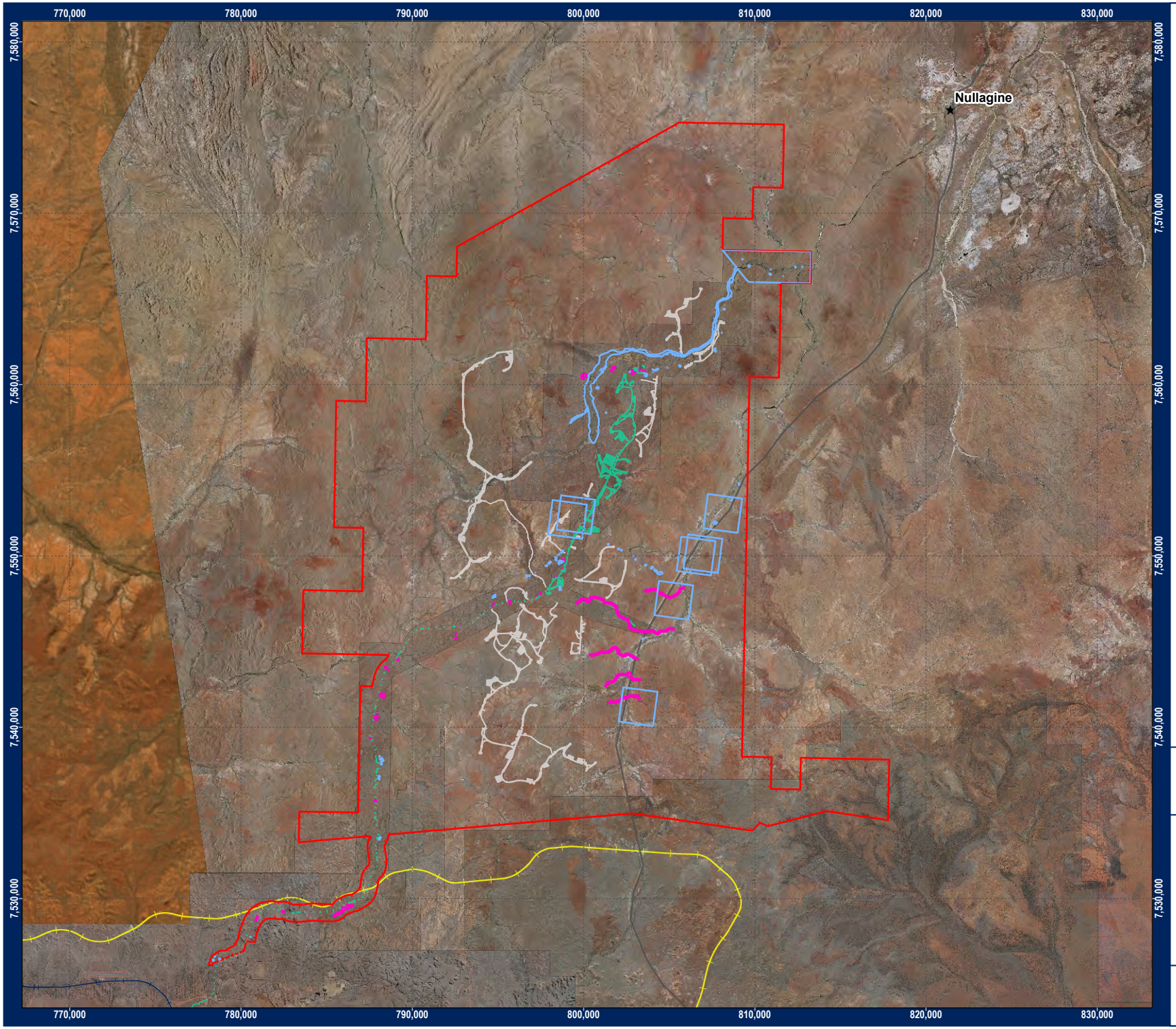

Legend

- Development Envelope
- GOV Towns
- Major Roads
- Fortescue Rail
- Roy Hill Rail
- Indicative Disturbance Footprint
- Approved Disturbance (Nullagine Pilot Wind Farm)
- DPLH Places - Registered
- DPLH Places - Lodged

Data Source(s):
Aerial, Fortescue and ESRI
All other data, Fortescue, 2025

N

0 2 4 6 8 10
Kilometers

Figure 9-1
Registered and Lodged
Aboriginal Heritage Sites

Requested By: R. Dorji — Date: 1/29/2026
Drawn By: R. Kerr — Size: A4L
Revised By: rykerr — Revision: 0
Approved By: — Confidentiality: 0
Scale: 1:300,000
Coordinate System: GDA 1994 MGA Zone 50
Project Name: 4519OP002_MP_EN_0093_PartIV_3
Document Name: 4519OP002_MP_EN_0093_029a_r0_Heritage

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9.4.2.3 Heritage Restriction Zones

Heritage Restriction Zones (HRZs) refer to a defined area that has been identified by Fortescue and or Traditional Owners to contain social, cultural, or heritage values that require specific restriction.

Restrictions applied to HRZs may include (but are not limited to):

- Limitations or restrictions on access requirements,
- Limitations on the types of works that may be undertaken within the HRZ boundary, and
- Requirement for further consultation to appropriately record cultural values contained within the HRZ area.

HRZs are an internal management measure implemented by Fortescue to provide an additional layer of protection for places of cultural significance. HRZs are areas where activities (that may include ground disturbing works) may be permitted in accordance with any relevant management strategies and conditions that have been put in place, and/or agreed between Fortescue and the Native Title stakeholders. These management strategies may include condition to exclude all activities including pedestrian access. Additional HRZs may be applied over previously identified Heritage Places to ensure that any ground disturbing works within that HRZ are compliant with relevant heritage approvals applicable to that Heritage Place.

To date, seven HRZs (Figure 9-2) are present in the Palyku section of the DE, which were identified through consultation with Palyku and also during heritage surveys (Table 9-5). These HRZs include undefined areas the Palyku Native Title stakeholders considered with potential to have cultural value. These HRZs will be subject to additional visitation to record and classify as Aboriginal Sites to be managed under the AH Act, or may remain as HRZs, managed in direct consultation with Palyku Native Title stakeholders.

There are no HRZs present within the Nyiyaparli section of the DE.

Table 9-5: Heritage Restrictions Zones within Palyku section of the DE

HRZ_ID	HRZ Type	Restriction Type	Description	Related Site ID (where applicable)
HRZ-0695	[redacted]			
HRZ-1277				
HRZ-1440				
HRZ-1680				

HRZ-1723	[redacted]
HRZ-1736	
HRZ-1737	

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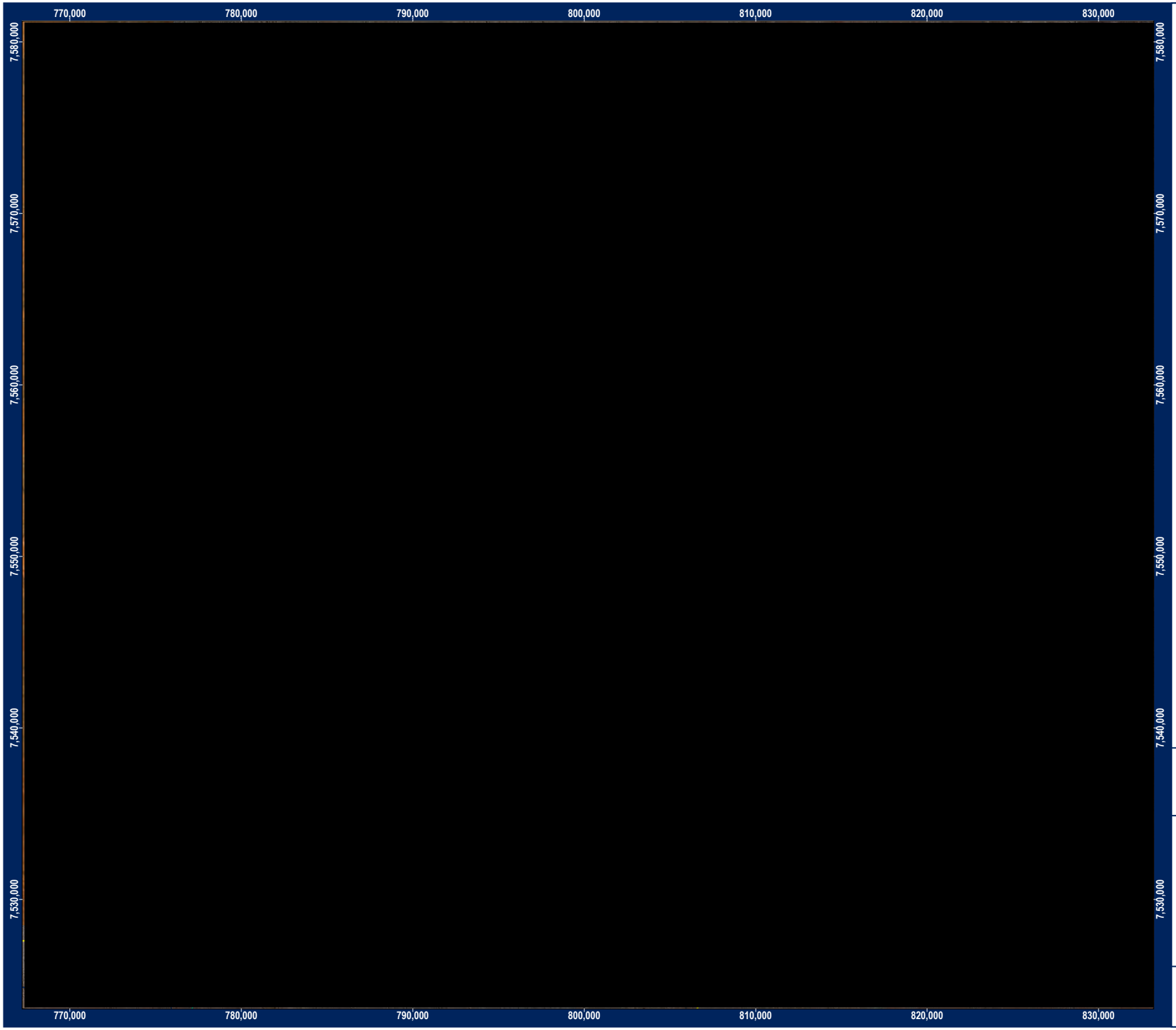

Legend

- Development Envelope
- GOV Towns
- Major Roads
- Fortescue Rail
- Roy Hill Rail
- Indicative Disturbance Footprint
- Approved Disturbance (Nullagine Pilot Wind Farm)
- Heritage Restriction Zones

Data Source(s):
Aerial, Fortescue and ESRI
All other data, Fortescue, 2025

N

0 2 4 6 8 10
Kilometers

Figure 9-2
Heritage Restriction Zones

Requested By: R. Dorji
Drawn By: R. Kerr
Revised By: rykerr
Approved By:
Scale: 1:300,000
Coordinate System: GDA 1994 MGA Zone 50
Project Name: 4519OP002_MP_EN_0093_PartIV_3
Document Name: 4519OP002_MP_EN_0093_029b_r0_HRZ

Date: 1/29/2026
Size: A4L
Revision: 0
Confidentiality: 0

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9.4.2.4 Culturally Significant Water Sources

The DE is located in the headwater areas of four river systems, being the Shaw River, Fortescue River, Nullagine River and Coongan River. The main watercourses that drain through the DE include the Nullagine River to the east, Bonnie Creek (a tributary of Nullagine River) to the north and Coongan River to the west. A number of pools, including Bonnie Pool are found along Bonnie Creek.

Through consultation, Fortescue recognises that water sources are an important cultural value to both Palyku and Nyiyaparli Peoples with water being linked to traditional and spiritual values and vital to health of Country. A request was made by both native title groups to ensure water sources (in general) were protected by minimising disturbance to creeklines and ensuring water flow is maintained.

While no specific water sources were identified by Nyiyaparli as being of particular cultural significance within the DE, Palyku identified two water sources of high cultural significance which are discussed below.

Bonnie Creek Tributary

During both on-country consults, Palyku highlighted the importance of Bonnie Creek from a cultural and environmental perspective. The Bonnie Creek Tributary has been recorded as an ethnographic site (PAL24-153) due to its importance as a travel route for Palyku people (both in the past and today), connections to camping and hunting areas, and ceremonial/dreaming stories. The ecosystems associated with the Bonnie Creek Tributary also add to its cultural value of this water course, providing a range of valuable traditional food and medicinal resources.

Today, Palyku use Bonnie Creek Tributary to undertake hunting, fishing, camping, and other recreational activities such as swimming. Therefore, maintaining the integrity of the water way, its water quality and flows, and its supporting ecosystems is of utmost importance to Palyku.

Bonnie Pool

Located within the Bonnie Creek Tributary, Bonnie Pool is another culturally significant water source within the DE. Recorded as ethnographic site PAL24-007, Bonnie Pool was identified during both on-country consults as a place still used today for camping and hunting activities (Plate 9-1). As Palyku also requested access to Bonnie Pool to be maintained during the life of the project so they could continue to undertake traditional activities here, Bonnie Pool meet the criteria as a ‘cultural receptor’.

Ensuring continue access and use of Bonnie Pool for camping and hunting activities is important to Palyku and any impacts to the water quality, water flow, or supporting ecosystems by the Proposal would be an impact to the cultural values associated with this place.

Plate 9-1 Bonnie Pool

During social surrounds Trip 2, several other locations were identified as containing water sources. However, as the values of these places are associated more with being potential camping and hunting areas, these locations are discussed in relation to their aesthetics and amenity values under Section 9.4.2.5.

9.4.2.5 Traditional Ecological Values

Traditional ecological values are another aspect of Social Surroundings that plays an important role in Palyku and Nyiyaparli culture and traditional practices. This includes culturally significant plants and animals used for bush tucker, tools or medicine, areas used for traditional activities such as camping and hunting, as well as important ecological features with cultural associations.

During consultation on the Proposal, both Palyku and Nyiyaparli expressed concern regarding potential impacts to native plants and animals in the area. In addition to maintaining the natural biodiversity of the area, which was noted by both groups as being important, Palyku also expressed concern for potential loss of plants used for traditional purposes (such as medicine).

While TEK surveys with Palyku are still ongoing, a survey undertaken recently identified a more detailed list of culturally significant plant and animal species. A total of 31 culturally significant plants and 16 culturally significant animals have been identified within the DE in the in the Palyku Native Title Determination Area (Appendix M).

No culturally significant plants or animals were identified by Nyiyaparli during consultation, however Nyiyaparli's People and Country Plan (KNAC, 2022) identifies culturally important animals and plants that may occur within the Proposal area. The information from the social surrounds consult aligns with the values that Nyiyaparli have identified through their People and Country Plan (KNAC, 2022).

Fortescue has undertaken a number of flora and fauna assessments for the Proposal (see Chapters 7 and 8) to provide context in the ecological environment of the Proposal.

9.4.2.6 Aesthetics and Amenity

During the Social Surroundings consultations, considerations for potential impacts from changes to the visual aesthetics of the area and amenity (use of country) from noise or dust generated by Fortescue's activities were discussed with Palyku and Nyiyaparli. Based on an understanding of key values in the area, Fortescue proposed locations for inclusion in the dust, noise, and visual impact assessments.

Most of the locations used in the dust, noise, and visual impacts assessments were general locations (or points of interest (POIs)) to understand the potential impacts across the entire area. This approach assists Traditional Owners to narrow down specific locations of concerns, especially where there is general use of the wider area. Where specific receptors were relevant, these were included.

Only 16 cultural receptors (Figure 9-5) were identified during social surrounds consults:

- Bonnie Pool (Palyku) as a location used for camping and hunting practices,
- Cookindina Pool (Palyku) as a location that may be used for camping and hunting practices,
- 4 Mile Well (Palyku) as a location that may be used for camping and hunting practices,
- Emu Spring / Well (Palyku) as a location that may be used for camping and hunting practices,
- Daylight Rockhole (Palyku) as a location that may be used for camping and hunting practices,
- 18 Mile Pool and Warrabu Site (Palyku) as a location that may be used for camping and hunting practices,
- Mooringinya Spring (Palyku) as a location that may be used for camping and hunting practices,
- Coobinacoola Pools (Palyku) as a location that may be used for camping and hunting practices,
- Minderungumya Hill (Palyku) as a location that may be used for camping and hunting practices,
- Bronzewing Pool (Palyku) as a location that may be used for camping and hunting practices,

- Trig Hill Well (Palyku) as a location that may be used for camping and hunting practices,
- Corkbark Spring (Palyku) as a location that may be used for camping and hunting practices,
- Wild Dog Spring (Palyku) as a location that may be used for camping and hunting practices,
- Tundununya Soak (Palyku) as a location that may be used for camping and hunting practices,
- Cattle Well (Palyku) as a location that may be used for camping and hunting practices, and
- Soda Springs (Nyiyaparli) for VIA to show visual impact from this location.

As discussed, the Proposal has been significantly reduced since the technical assessments were completed. As a result, several of the cultural receptors selected (particularly those in the northern part of the DE), are now located farther from the Proposal elements (Figure 9-5) than they were at the time of assessment.

Two additional visual locations were chosen by Fortescue along the Nullagine Mine Haul Road (VIA_L and VIA_K) as POIs. These two locations were close to Nyiyaparli heritage places and chosen to assist in consultation with Nyiyaparli regarding potential visual amenity impacts if these places were visited.

Noise

Noise was considered a potential impact to Palyku's ability to hunt and camp on country. Bonnie Pool was identified as a place used by Palyku for camping and hunting practices. Additionally, Palyku identified several broad hunting areas they use within the DE and surrounding area. Noise monitoring locations were selected across the DE including near Bonnie Pool. Noise modelling results are discussed in Section 9.7.1.4.

No specific areas or places of noise sensitivity were identified during consultation with Nyiyaparli as no concerns were raised regarding noise generated from the wind turbines.

During consultation, both Palyku and Nyiyaparli confirmed they used the area within and surrounding the DE for cultural and recreational purposes, and requested the ability to maintain access to continue practicing these traditional activities. Access to Country is discussed further in Section 9.4.2.7.

Visual

Maintaining the aesthetics of the natural landscape and important cultural landscapes within and surrounding the Proposal was identified as a key value by Palyku and Nyiyaparli. Potential visual impacts on the use of cultural places were also considered regarding maintaining visual amenity and use of country. The VIA assessed potential impacts to both Bonnie Pool (Palyku) and a location close to Soda Springs (Nyiyaparli).

To address Palyku feedback provided during the June 2024 social surrounds consult (Trip 1) on visual impacts, the Proposal IDF was revised to remove two wind turbines initially located close to Bonnie Pool (VIA_B). The Proposal has also been designed to ensure turbines will not located on hills or mesas which could increase their visibility within the landscape. Outcomes of the VIA were presented to Palyku during the March 2025 social surrounds consult (Trip 2) through the use of augmented reality application.

During the September 2024 social surrounds consult, Nyiyaparli was presented with images of what the proposed project layout would look like on country through the use of augmented reality. For much of Nyiyaparli country, the landscape provides a natural barrier preventing the wind turbines being seen along the Nullagine Mine Haul Road and the proposed transmission line (part of the Nullagine pilot wind farm). In addition to the POIs chosen by Fortescue, Nyiyaparli identified Soda Springs as a place they visit regularly while hunting and camping in the area and were curious as to whether the wind turbines would be seen from this location. The visual assessment for Soda Springs was undertaken using the images from VIA_I.

Since the September 2024 social surrounds consult, the Proposal has been significantly reduced. As a result, several of the cultural receptors selected during the social surrounds consults (particularly those in the northern part of the DE), are now located farther from the Proposal elements. Given that the redesign involves a reduction in turbine numbers and IDF extent, the absence of further discussion with Nyiyaparli and Palyku regarding these changes is not considered problematic.

Dust

Fortescue commissioned GHD to complete a dust assessment (GHD, 2025) for the Proposal. Dust has the potential to impact on visual amenity and consequently aesthetics of the area. The main source of dust emissions from the Proposal will be highest during the construction phase (GHD, 2025). Fortescue consider that any impacts from dust emissions on the enjoyment or use of country for traditional activities will be temporary and isolated in proximity to the source of the activity, posing more of a short-term impact and nuisance rather than a significant impact.

One cultural receptor, Bonnie Pool, was identified as having potential for impacts from dust emissions. This is discussed further in Section 9.7.1.4.

9.4.2.7 Access to Country

Maintaining access to country and specific places to undertake traditional activities is a native title right afforded to Traditional Owners under the *Native Title Act 1993*. Both Palyku and Nyiyaparli practice traditional activities on their respective lands.

During consultation, Palyku noted several broad areas used for hunting that intersect the DE. Six land types were associated with the hunting areas identified by Palyku and included:

- Hills and ranges with spinifex grasslands,
- Plateaux, mesas and breakaways with spinifex grasslands,
- Stony plains and hills with spinifex grasslands,
- Stony plains with spinifex grasslands,

- Stony gilgai plains with tussock grasslands and spinifex grasslands, and
- River plains with grassy woodlands and shrublands, and tussock grasslands.

Bonnie Pool was identified as a specific place that Palyku currently access for camping while hunting in the area and requested access to the pool is maintained during construction and operation of the Proposal.

Nyiyaparli did not identify any specific places within the DE that they currently use, or would like to maintain access to. However, Nyiyaparli did state that they use the Nullagine Mine Haul Road to access the surrounding areas and expressed their desire to maintain access to this road.

Fortescue acknowledged during social surrounds consultation with both groups that access to the area would not be restricted during operations and that all existing tracks would have the same accessibility as they do now. It is expected that areas may be restricted during construction for safety reasons. However, these restrictions will be temporary and isolated to where construction is occurring. Access to Bonnie Pool will not be impacted during construction or operation of the Proposal.

9.4.3 Non-Aboriginal Heritage

Database searches were undertaken to identify non-Aboriginal heritage values relevant to the Proposal. One heritage value was identified within the DE from a search of the inHerit Database: Bonney Downs Homestead and Log Cabin (Place Number 00820).

The Bonney Downs Homestead and Log Cabin consists of two buildings surrounded by verandahs, of which, the Log Cabin was constructed in 1910, and the homestead was built around 1933 (Figure 9-4). They have aesthetic, historic and social heritage values. The design of the Bonney Downs Homestead is typical of many Pilbara homesteads, and it was constructed using methods no longer practised. Bonney Downs Homestead is classified by the National Trust and is on the Register of the National Estate (Government of WA, 2017).

There are no World Heritage or Commonwealth Heritage listed places within the DE.

9.4.4 Amenity

9.4.4.1 Noise and Vibration

Fortescue engaged Talis Consultants (Talis) (2024a) to undertake a noise assessment of the potential noise impacts from the Proposal, including construction and operational activities, on surrounding areas. This noise assessment is summarised in this document and provided in Appendix N.

The noise sensitive receptors considered in this assessment include:

- Bonney Downs Homestead, and
- The town of Nullagine.

A total of 15 cultural receptors were identified for the noise assessment by Palyku as potential camping areas that may be impacted by noise generated from the Proposal:

- Bonnie Pool,
- Cookindina Pool,
- 4 Mile Well,
- Emu Spring / Well,
- Daylight Rockhole,
- 18 Mile Pool and Warrabu Site,
- Mooringinya Spring,
- Coobinacoola Pools,
- Minderungumya Hill,
- Bronzewing Pool,
- Trig Hill Well,
- Corkbark Spring,
- Wild Dog Spring,
- Tundununya Soak,
- Cattle Well.

As discussed, several of the cultural receptors selected (particularly those in the northern part of the DE), are now located farther from the Proposal elements than they were at the time of assessment.

Activities which have noise related value (e.g. Camping, Hunting, and Ceremonial use) are not defined in the Noise Regulations. There is also a lack of previous information and proxy data to inform the assessment, and to determine the appropriate noise target criteria.

To establish reasonable noise target levels for the different noise sensitive activities, Talis (2024) considered the EP Act and Australian Standard AS2107. Neither the Noise Regulations nor AS2107 has specifications regarding traditional activities such hunting. However, recommendations from the EPA for a cumulative level of 50dBA to assess noise impacts for recreational users of Hearson's Cove on the Burrup Peninsula is used as a precedent for receptors that are outside of the definition of sensitive receivers (EPA Bulletin 1077).

Based on the identified values, three activities were considered in this assessment and appropriate target noise levels and threshold noise levels were established as described in Table 9-6: Table 9-6 and Table 9-7. These activities included:

- Camping (at night): Noise could result in sleep disturbance and annoyance,
- Hunting: It is expected that hunting will only take place during daylight hours where the hunter uses visual cues. Night-time hunting is not expected, and
- Day use / Ceremonial use: Speech intelligibility and annoyance needs to be considered for activities undertaken during the day or ceremonial use.

The potential noise impacts from Wind Turbine Generators (WTG) have been assessed against the criteria defined in the South Australian Wind Farms environmental noise guidelines (EPA, 2009). These guidelines have been endorsed by the WA EPA and the Western Australian Planning Commission (WAPC) (see Planning Bulletin 67 [8]). The South Australian guideline states that the predicted equivalent noise level (LAeq,10min), adjusted for tonality in accordance with these guidelines, should not exceed:

- 35 dB(A) at relevant receivers in localities, which are primarily intended for rural living, or
- 40 dB(A) at relevant receivers in localities in other zones, or
- The background noise (LA90, 10min) by more than 5 dB(A).

Table 9-6 describes the proposed target noise levels and threshold levels adopted for the Proposal for noise sensitive activities undertaken at cultural receptors. Table 9-7 describes the threshold noise level for noise sensitive receivers.

Table 9-6: Activity Based Noise Target Levels (Talis, 2024)

Activity	Target Noise Level (dB(A))	Threshold Level (dB(A))*	Comment
Camping (night-time)	30	50	The night-time target levels are based on avoiding noise induced sleep disturbance and annoyance. The threshold levels adopted is based on the EPA's cumulative level of 50dBA to assess noise impacts for recreational users that are outside of the definition of sensitive receivers (EPA Bulletin 1077).

Activity	Target Noise Level (dB(A))	Threshold Level (dB(A))*	Comment
Hunting (daytime)	45		The daytime hunting target levels are based on the assigned levels in the Noise Regulations and assume that the hunter uses visual cues during the day (whereas the hunter is more dependent on auditory cues during night). The threshold levels adopted is based on the EPA's cumulative level of 50dBA to assess noise impacts for recreational users that are outside of the definition of sensitive receivers (EPA Bulletin 1077).
Daytime use / Ceremonial	45		The target levels are based on avoiding annoyance. It should be noted that these levels are set for activities were speaking to others is involved. The threshold levels adopted are based on AS2107 levels for educational buildings. The threshold levels adopted is based on the EPA's cumulative level of 50dBA to assess noise impacts for recreational users that are outside of the definition of sensitive receivers (EPA Bulletin 1077).

* At locations that fall outside of the definition of sensitive receivers (as defined in Environmental Regulations), a precedent from Hearson's Cove has been used (EPA 2002).

Table 9-7: Noise Regulation Assigned Noise Level

Receiver	Threshold Noise Level (LAeq, 10min)/ Rural Receiver Limit (For Windfarms)
Sensitive Receiver	
Bonney Downs Homestead	35
Nullagine Town	
Proposed Bonney Downs Camp	40
Cultural Receptor	
Bonnie Pool	50
Cookindina Pool	
4 Mile Well	
Emu Spring / Well	
Daylight Rockhole	
18 Mile Pool and Warrabu Site	
Mooringinya Spring	
Coobinacoola Pools	
Minderungumya Hill	
Bronzewing Pool	
Trig Hill Well	
Corkbark Spring	
Wild Dog Spring	
Tundununya Soak	

Receiver	Threshold Noise Level (LAeq, 10min)/ Rural Receiver Limit (For Windfarms)
Cattle Well	

To develop an understanding of the baseline noise levels within the area, Talis (2024) undertook baseline noise monitoring. Eight[12] monitoring locations were selected within the DE, widespread over the entire area. The identified sensitive receptors and noise monitoring locations are shown in Figure 9-5 and Figure 9-6.

Table 9-8 provides a summary of the baseline noise results at each monitoring location, separated into day (7am to 7pm), evening (7pm to 10pm) and night (10pm to 7am). The noise parameter LA90 which is the noise level that is present for 90% of time has been used. Baseline noise varied over the DE:

- Daytime: 30 – 57 dB(A)
- Evening: 20 – 31 dB(A)
- Night: 19 – 32 dB(A)

Table 9-8: Baseline Noise Monitoring Results Summary (Talis, 2024)

Monitoring Location	Description of surrounding area	Time of Day	Average LA90
BD_NM_02 (near Bonnie Pool)	Slightly hilly, low lying sparse shrubs	Day	32
		Evening	20
		Night	19
BD_NM_03	Dense low-lying shrubs	Day	48
		Evening	26
		Night	26
BD_NM_04 (near Bonney Downs Homestead)	Hilly, low lying sparse shrubs	Day	35
		Evening	31
		Night	32
BD_NM_05	Flat, Low lying mild amount of shrubs.	Day	38
		Evening	27
		Night	27
BD_NM_06	Slightly hilly, low-lying shrubs.	Day	30
		Evening	25
		Night	26
BD_NM_07	Hilly, shrubs.	Day	57
		Evening	27
		Night	29
BD_NM_08	Dense trees, shrubs.	Day	55

[12] Noise monitor BD_NM_01 only recorded a partial dataset due to a technical fault. Therefore, this data has been omitted from noise monitoring results

Monitoring Location	Description of surrounding area	Time of Day	Average LA90
		Evening	26
		Night	26

Temporary vibrations will occur mainly due to construction activities including operation of construction plant and machinery, earthworks and general ground disturbing activities. Blasting is an uncommon activity in terms of the construction and operation of a wind farm.

Additionally, Fortescue engaged Talis Consultants (Talis 2025) to undertake potential noise impacts on culturally significant fauna including kangaroos, emus, and echidnas. The study was commissioned to address the Palyku Traditional Owners' concern that continuous turbine noise could mask predator sounds, and also may alter animal behaviour, potentially driving these culturally important species away and reducing access to traditional food sources. The study quantified the received noise levels for each species, evaluated behavioural, communication, and physiological effects, and used noise modelling and risk mapping to estimate disturbance and masking risks. This fauna noise impacts study is provided in Appendix O.

9.4.4.2 Visual Amenity

The EPA objectives relevant to visual and landscape impacts are those regarding the protection of social surroundings, and specifically the protection of social surroundings from harm (EPA, 2023b). This includes protecting modifications to sensitive viewsheds and changes to landscape amenity.

Given the difference in visual and landscape considerations for wind turbines compared to other structures such as solar farms and electrical infrastructure, Section 6.1 of Planning Bulletin 67 of the WAPC (WAPC, 2007) has been used to inform this assessment. This document states that:

"The degree to which a wind farm development will impact on the landscape will depend on:

- *Siting, layout and design of the turbines, infrastructure, signage and ancillary facilities, including provision for tourism.*
- *Number, colour, shape, height and surface reflectivity of the towers and blades.*
- *Visibility of the development, having regard to the location, distance from which the development is visible, skyline and viewsheds.*
- *Significance and sensitivity of the landscape, having regard to topography, the extent and type of vegetation, natural features, land use patterns, built form character and community values.*

Methods to ameliorate visual impact include:

- *Ensuring turbines look alike, have a clean, sleek appearance and that the blades rotate in the same direction.*

- *Minimising the number of turbines, as appropriate, by using the largest possible model (subject to the visual absorption capabilities and environmental considerations of the site) rather than numerous small ones.*

- *Siting the wind farm, ancillary buildings, access roads and transmission infrastructure to complement the natural landform contours and landform backdrop, including ridgelines.*

- *Ensuring the choice of materials and colour (e.g. off-white and grey for turbines, low contrast for roads) for the development complements the skyline and the backdrop of the view sheds.*

- *Minimising removal of vegetation and using advanced planting of vegetation screens as visual buffers where appropriate.*

- *Ensuring good quality vegetation and landform rehabilitation, on-site and off-site, where appropriate.*

- *Locating turbines to reflect landscape and topographical features (e.g. a random pattern may suit a rolling, varied landform and a linear pattern may suit a coastal edge, farm or industrial site).*

- *Avoiding clutter, such as advertisements and apparatus."*

The Landscape and Visual Impact Assessment (SLR, 2024b) is provided in Appendix P.

Visual Landscape Evaluation

A landscape study undertaken by the former Department of Conservation and Land Management (CALM, 1994) classified WA landscapes into broad Landscape Character Types (LCT). The Proposal is located within the Nullagine Hills LCT. This LCT is variable, characterised by a gradual spinifex plain and rugged hills dissected by drainage lines at an elevation of 160-480 m Australian Height Datum (AHD). The land surface elevation where the wind turbines are proposed, ranges from 450 – 500 m AHD (Geoscience Australia, 2010).

A Landscape Character Unit (LCU) is a smaller unit than an LCT, providing information on the variations within the LCT at a local scale. The LCUs were identified based on Land Systems, vegetation mapping, aerial imagery and a site visit. The final LCUs were chosen based on a visual landscape character preference and in the context of their rarity in the Study Area. The DE was characterised into the following five LCUs (SLR, 2024b), as shown on Figure 9-3:

- Plains (LCU 1): characterised by a stony, clayey or sandy plain with mix of blue sky, various hues of green / brown vegetation, and ochre to pale earth,

- Ranges, hills and low rises (LCU 2): is mostly rounded hills or slopes, ochre earth, contrasting mix of blue sky, various hues of green/ brown vegetation,

- Major waterways and drainage lines (LCU 3): characterised by plains or hills surrounding pools (or sandy riverbeds), flood plains, tall trees and a contrasting mix of blue sky and various hues of green, brown, and sometimes white vegetation,

- Mining and infrastructure (LCU 4): Dominated by non-natural surfaces of built form and the disturbed or bare soils of various colours, often with vegetation in the foreground or background, and

- Townsites and residential (LCU 5): Dominated by non-natural surfaces of built form and the disturbed or bare soils of various colours, often with vegetation in the foreground or background. The Bonney Downs Homestead was the only area within the DE classified as LCU 5.

Impacts associated with visual amenity are related to how an individual or group perceives and uses an area. Thirteen viewpoints were identified by Fortescue for the Proposal based on principles for potential use of the area and in consultation with Traditional Owners. Given the limited public access to the majority of the DE, the relevant receptors for this assessment are predominately related to the Traditional Owner and Pastoralist use of the area. Several points along Marble Bar Road were chosen for general public receptors. A total of 13 viewpoints were assessed for the Proposal. As mentioned previously, the Proposal has been significantly reduced since the technical assessments were completed. As a result, several of the viewpoints selected (particularly those in the northern part of the DE), are now located farther from the Proposal elements than they were at the time of assessment.

Visual Management Objectives

The WAPC Visual Landscape Planning in Western Australia: A manual for evaluation, assessment, siting, and design (2007) adopts three broad Visual Management Objectives (VMOs):

- Best practice siting and design,

- Protection and enhancement, and

- Restoration of degraded character or enhancement opportunities.

The VIA (SLR 2024b) adopted the following project-specific VMOs:

- The Project should not result in a dominant change in view for moderate to high sensitivity viewpoints that are located > 1 km from the Project Area,

- The Project should not result in a significant modification to the visual catchment, turbines may be visually apparent and become a major element in the landscape but should not dominate the existing visual catchment, and

- Minimise the impact of the Project that results in the removal or visual alteration/disruption of key landscape features.

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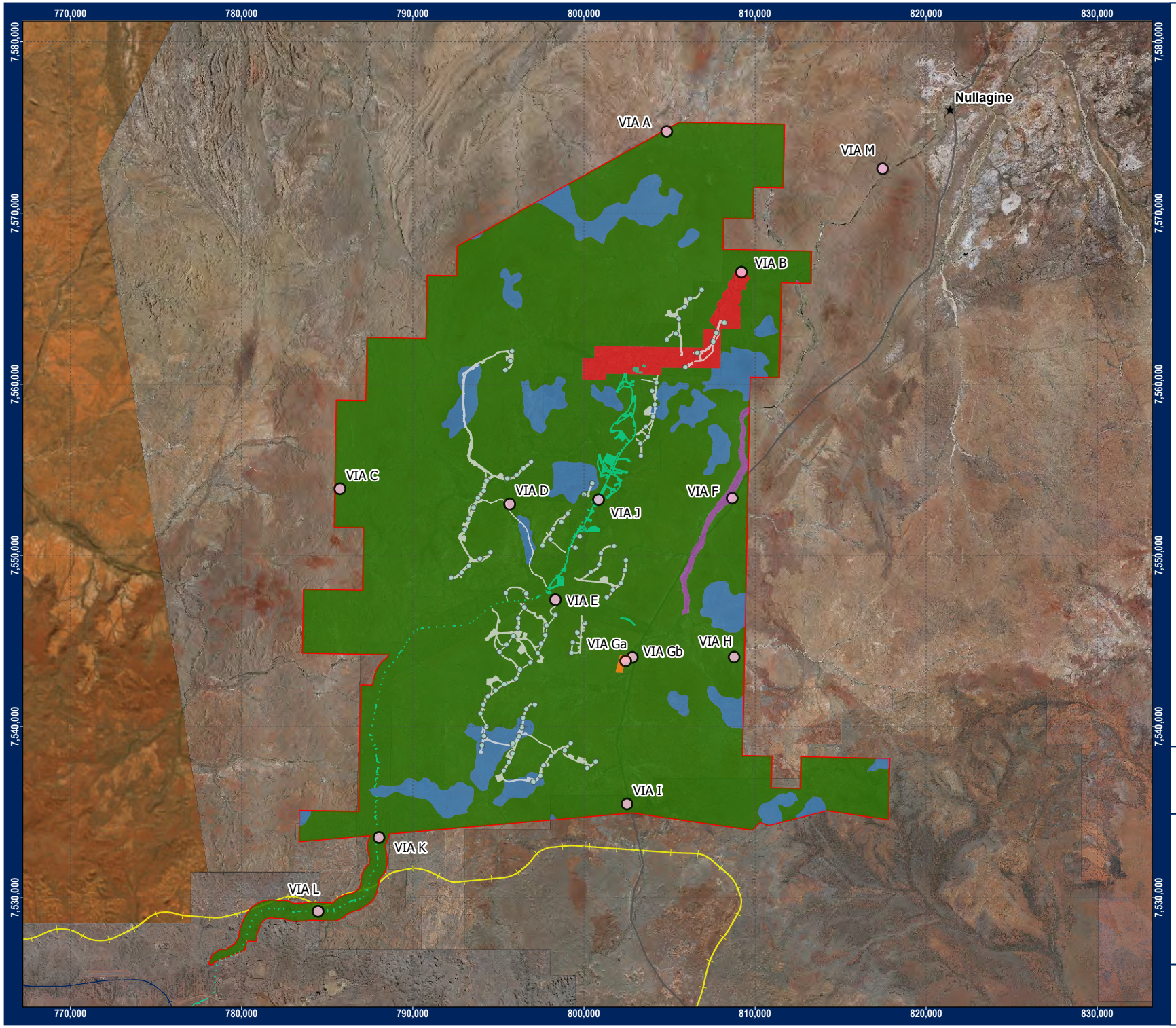

Legend

- Development Envelope
- GOV Towns
- Major Roads
- Fortescue Rail
- Roy Hill Rail
- Indicative Disturbance Footprint
- Approved Disturbance (Nullagine Pilot Wind Farm)
- Turbine Locations
- VIA Viewpoints

Landscape Character Units

- Mining and Infrastructure
- Plains
- Ranges, hills and low rises
- River system
- Townsites and Residential

Data Source(s):
Aerial, Fortescue and ESRI
All other data, Fortescue, 2025

N

0 2 4 6 8 10
Kilometers

Figure 9-3
Landscape Character Units and VIA Viewpoints

Requested By: R. Dorji	Date: 1/30/2026
Drawn By: R. Kerr	Size: A4L
Revised By: rykerr	Revision: 0
Approved By:	Confidentiality: 0
Scale: 1:300,000	
Coordinate System: GDA 1994 MGA Zone 50	
Project Name: 4519OP002_MP_EN_0093_PartIV_3	
Document Name: 4519OP002_MP_EN_0093_030_r0_Landscape	

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9.4.4.3 Dust

Fortescue engaged GHD (2025) to undertake a dust assessment related to potential impacts of dust deposition. This report is provided in Appendix Q, with outcomes of the assessment discussed in Section 9.6.1.6.

The Pilbara is recognised as having elevated dust levels, higher than other areas in Western Australia (Government of Western Australia, 2025). An aggregated emission inventory for the Pilbara was undertaken by SKM (2000) for the 1999/2000 financial year. This study calculated that approximately 170,000 tonnes of dust were emitted as a result of wind erosion and approximately 195,000 tonnes from wildfires. Other sources of dust include:

- Dust entrainment due to vehicle movements along unsealed public roads,
- Episodic emissions from prescribed and controlled burning as well as wildfires,
- High wind events,
- Local agricultural/pastoral activities, and
- Dust emissions from iron ore moved along private railways.

Two sensitive receptors were identified for dust emissions including:

- Bonnie Pool (cultural receptor), and
- Bonney Downs Homestead.

9.4.5 Economic Activity

The Pilbara region's economy is dominated by the mining industry, accounting for 88% of total economic output. The region's iron ore and liquefied natural gas industries represent more than 70% of the mineral and energy production in Western Australia. These industries continue to grow in the region (Pilbara Development Commission, 2024). The DE is adjacent to the Christmas Creek Iron Ore Mine Expansion DE (MS 1033) and overlaps the Nullagine Iron Ore Mine (Fortescue).

Additional operational mines within 50 km of the DE include Cloudbreak and Christmas Creek mines (Fortescue), Marillana Agate, McPhee Creek and Roy Hill Iron Ore (DMIRS, 2024).

9.4.6 Towns and Population Centres

The Proposal is located in a large-scale landscape setting in a remote area of the east Pilbara. The nearest towns are Nullagine and Marble Bar which are approximately 10 km northeast and 80 km north of the DE, respectively. According to the 2021 Census, Nullagine has approximately 147 individuals of 33 families, while Marble Bar has similar population, with 153 individuals of 53 families (ABS, 2021).

9.4.7 Recreation and Tourism

Tourism in the Pilbara region is driven by the area's unique and globally recognised natural features, alongside activities related to mining, construction, and business travel (DPIRD, 2024). This sector is viewed as a vital avenue for economic diversification in the region (Kelley,

2005). The Pilbara's natural environment supports a range of outdoor tourism activities, including camping, boating, and fishing (Pilbara Development Commission, 2024).

Key locations that may be used for recreation and tourism includes the Nullagine townsite, Bonnie Pool and Marble Bar road. Marble Bar road is the main access road between Newman, Marble Bar and Port Hedland.

9.4.8 Pastoral

The majority of the DE (93.37%) is situated in pastoral leases across the Bonney Downs, Hillside and Roy Hill pastoral leases. Bonney Downs pastoral lease represents 85.14% (76,600.53 ha) of the DE, while Hillside represents 8.23% (7,409.19 ha) and Roy Hill represents 0.06% (55.81 ha).

Bonney Downs homestead is located within the DE, while the homesteads for Hillside and Roy Hill are outside of the DE. Given the limited overlap with Hillside and Roy Hill pastoral leases they will not be discussed further in this assessment.

The Bonney Downs pastoral lease (3114/1208) covers an area of approximately 373,621 ha of which 20.50% overlaps the DE. Fortescue has engaged with the Bonney Downs Station owner on the environmental approval process and Proposal timelines (see Section 4.2). In the absence of any information from the station owner on sensitive receptors, Fortescue has assumed that values important to the owner include:

- Visual impact of the Proposal from the homestead;
- Noise and dust emissions at the homestead; and
- The ability to continue to run a profitable business.

Figure 9-4 shows the location of the towns and surrounding
social setting, and Figure 9-5 shows cultural receptors and other receptors within and outside of the DE.

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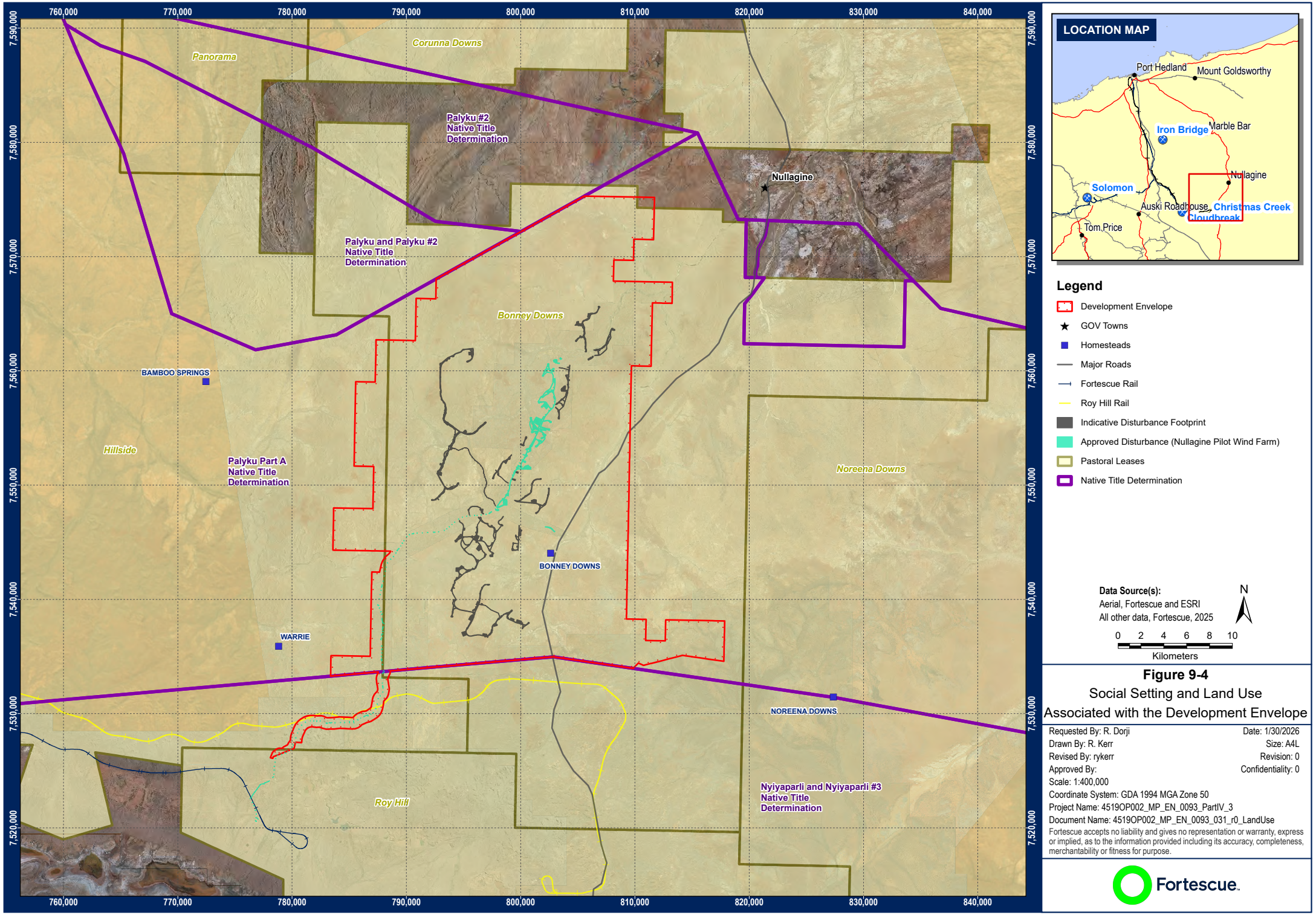

Legend

- Development Envelope
- GOV Towns
- Homesteads
- Major Roads
- Fortescue Rail
- Roy Hill Rail
- Indicative Disturbance Footprint
- Approved Disturbance (Nullagine Pilot Wind Farm)
- Pastoral Leases
- Native Title Determination

Data Source(s):
Aerial, Fortescue and ESRI
All other data, Fortescue, 2025

N

0 2 4 6 8 10
Kilometers

Figure 9-4
Social Setting and Land Use
Associated with the Development Envelope

Requested By: R. Dorji	Date: 1/30/2026
Drawn By: R. Kerr	Size: A4L
Revised By: rykerr	Revision: 0
Approved By:	Confidentiality: 0
Scale: 1:400,000	
Coordinate System: GDA 1994 MGA Zone 50	
Project Name: 4519OP002_MP_EN_0093_PartIV_3	
Document Name: 4519OP002_MP_EN_0093_031_r0_LandUse	

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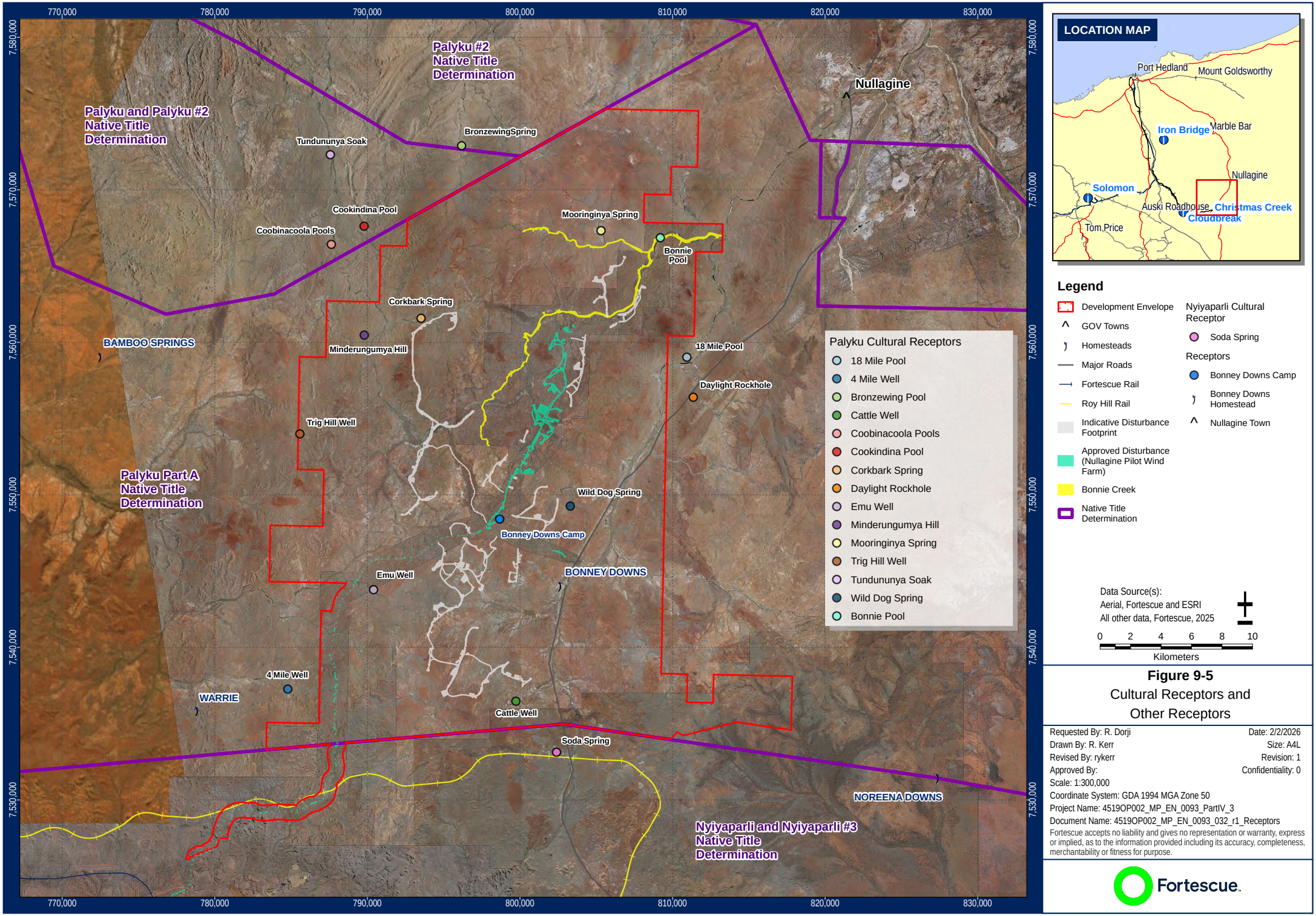

Figure 9-5
Cultural Receptors and Other Receptors

Requested By: R. Dorji	Date: 2/2/2026
Drawn By: R. Kerr	Size: A4L
Revised By: rykerr	Revision: 1
Approved By:	Confidentiality: 0
Scale: 1:300,000	
Coordinate System: GDA 1994 MGA Zone 50	
Project Name: 4519OP002_MP_EN_0093_PartIV_3	
Document Name: 4519OP002_MP_EN_0093_032_r1_Receptors	

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9.5 Potential Impacts

9.5.1 Aboriginal Cultural Heritage and Cultural Values

The potential direct and indirect impacts from the Proposal on Aboriginal Cultural Heritage and Cultural Values are outlined in Table 9-9 and Table 9-10.

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Table 9-9: Potential Direct and Indirect Impact on Palyku Cultural Values from the Proposal

Theme/Topic	Concerns/Queries raised by Traditional Owners	Potential Impact	Potential consequence
Direct Impacts			
Heritage Places	• Unauthorised disturbance to Heritage Places and objects within the DE. • Unauthorised access by Fortescue personnel and contractors.	• Removal or damage to cultural material, including engravings and grinding materials.	• Loss of cultural information and connection to ancestors. • Potential breach of AH Act (WA) for unauthorised impact to heritage sites.
Plants & Animals	• Concern expressed about bird collision with turbine and expected increase in feral animals • General concern expressed about native plants and animals, and maintaining the overall biodiversity of the area. • Avoid disturbance to mesas, identified by Palyku as a place of important animal habitat.	• Loss native birds and bats or changes to migratory patterns • Loss of biodiversity of native plant and animal species. • Inability to access areas for traditional activities (e.g. resource gathering / hunting).	• Loss of culturally significant animals and plants used for traditional purposes (e.g. medicine, bush tucker, hunting)
Water	• General concerns on impact on waterways and flows from springs, river and creek catchments, waterholes and creeks. • Impacts on water sources perceived to have been impacted by Nullagine Iron Ore Project. • Disturbance to Bonnie Pool.	• Disturbance to creek lines or banks from proposed crossings or widening of existing tracks over creeks. • Loss of Bonnie Pool.	• Loss of healthy waterways and Country. • Potential breach of AH Act (WA) for unauthorised impact to heritage sites (where water sources are recorded as Heritage Places).
Indirect Impacts			
Dust	• General concern around dust emissions from the Proposal.	• Increased dust from construction and operation reducing aesthetics at culturally significant areas and the wider cultural landscape.	• Loss of enjoyment of country. • Loss of culturally significant animals and plants used for traditional

Theme/Topic	Concerns/Queries raised by Traditional Owners	Potential Impact	Potential consequence
		• Decline of plant health for culturally significant flora in high-risk areas.	purposes (e.g. medicine, bush tucker, hunting).
Visual amenity	• Request to keep infrastructure (turbines, poles) off mesas and hills. • Being able to see wind turbines from Bonnie Pool	• Reduced aesthetics at culturally significant areas and wider cultural landscape. • No longer use or visit the area to undertake traditional activities.	• Loss of natural landscape and connection to Country and culture in this area.
Noise and vibration	• Vibration from operating wind turbines affecting native animals. • Excessive noise levels impacting ability to undertake traditional activities at Bonnie Pool or surrounding areas	• Reduced use of the area for traditional activities due to noise from construction. • Permanent loss of access to areas for traditional activities due to noise from operation. • Noise and Vibration from operating wind turbines resulting in altered animal behaviour (discussed further in Chapter 10: Terrestrial Fauna).	• Loss of connection to Country and culture in this area.
Access to Country	• Maintain access to the development area. • Maintain access to Bonney Downs area as a place used for camping and hunting.	• Reduced use of the area or inability of access the area for traditional activities resulting in loss of connection to Country and cultural practices.	• Loss of connection to Country and culture in this area.
Water	• Impacts to water flow and quality of rivers, Bonnie Pool and creek lines.	• Altered hydrological regime of rivers and creek lines impacting health of waterways and natural characteristics.	• Loss of healthy waterways and Country. • Cultural responsibility for downstream impacts on neighbouring language group Country.

Table 9-10: Potential Direct and Indirect Impact on Nyiyaparli Cultural Values from the Proposal

Theme/Topic	Concerns/Queries raised by Traditional Owners	Potential Impact	Potential consequence
Direct Impacts			
Heritage Places	• Unauthorised disturbance to Heritage Places and objects within the DE. • Unauthorised access by Fortescue personnel and contractors.	• Removal or damage to cultural material, including engravings and grinding materials.	• Loss of cultural information and connection to ancestors. • Potential breach of AH Act (WA) for unauthorised impact to heritage sites.
Plants & Animals	• General concern expressed about native plants and animals, and maintaining the overall biodiversity of the area.	• Reduction in biodiversity of plants and animals in the area.	• Loss of culturally significant animals and plants.
Water	• Reduced water quality due to contamination or excess sediment runoff. • Reduction of surface water flow in waterways.	• Disturbance to creek lines or banks from proposed crossings or widening of existing tracks over creeks. • Changes to water quality from unmanaged excess sediment	• Loss of healthy waterways and Country.
Indirect Impacts			
Visual amenity	• Soda Springs to be added as a cultural receptor for potential visual impacts.	• Reduced aesthetics at culturally significant areas. • No longer use or visit the area to undertake traditional activities.	• Loss of natural landscape and connection to Country and culture in this area.
Access to Country	• Maintain continued access to DE for hunting purposes.	• Inability to access areas for traditional activities (e.g. resource gathering / hunting).	• Loss of connection to Country and culture in this area.
Water	• Impacts to water flow and quality of rivers and creek lines.	• Altered hydrological regime of rivers and creek lines impacting health of waterways and natural characteristics.	• Loss of healthy waterways and Country. • Cultural responsibility for downstream impacts on neighbouring language group Country.

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9.5.2 Non-Aboriginal Heritage

Potential direct impacts from the Proposal on Non-Aboriginal heritage include damage or degradation of Bonney Downs Homestead and Log Cabin from construction and operation of the Proposal.

9.5.3 Amenity

9.5.3.1 Visual Amenity

The Proposal will result in permanent changes to the landscape due to the placement of man-made structures in an otherwise natural landscape.

9.5.3.2 Noise and Vibration

Potential impacts include:

- An increase in noise levels compared to baseline during construction,
- An increase in noise levels compared to baseline during wind farm operations,
- Increased noise levels and human discomfort during construction activities, due to elevated noise levels and ground-borne vibration at Bonney Downs Homestead, and
- Increased noise levels and human discomfort during operations, due to elevated noise levels and ground-borne vibration at Bonney Downs Homestead.
- Noise from the WTG may cause physical injury, behavioural disturbance, and masking effects that impact culturally significant species.

9.5.3.3 Dust

There are potential impacts in relation to the Proposal resulting from dust on Bonney Downs Homestead.

9.6 Mitigation

9.6.1 Aboriginal Cultural Heritage and Cultural Values

Fortescue will work collaboratively with Palyku and Nyiyaparli to outline the management measures that will be implemented by the Proposal to avoid or minimise impacts to social, cultural, and heritage values. Key mitigation measures for cultural values related to Flora and Vegetation and Terrestrial Fauna are outlined in the EMP (Appendix B) and implemented to appropriately manage the potential environment impacts to shared values. Key mitigation for the management of cultural values associated with Inland Waters are outlined in Section 10.1.6.3 and will be implemented to appropriately manage the potential environmental impacts to shared values.

Fortescue is committed to ongoing consultation with Palyku and Nyiyaparli and their representative bodies, PJAC and KNAC, in relation to the construction and operation of the Proposal.

Management measures to address the potential impacts detailed in Section 9.7.1 are provided in Table 9-11.

Table 9-11: Management Measures to Address Potential Impacts on Cultural Values

Mitigation Hierarchy	Impact topic	Mitigation
Avoidance	Heritage Places	• Undertake heritage surveys and consultation to identify Heritage Places and areas of cultural significance, • Undertake relevant impact assessments / studies to assess potential impacts as designs plan change (where applicable), • All Heritage Places and Heritage Restriction Zones (HRZs) will be identified in Fortescue's GIS system, • IDF designed to avoid Heritage Places and areas of cultural significance (where practicable), and • Fencing of Heritage Places in proximity to proposed works (where required) or demarcation of LUC activity area in accordance with Fortescue's Heritage LUC Demarcation Procedure (100-GU-HE-0010). • *Aboriginal Cultural Heritage Act 1972* can regulate direct disturbance (e.g. clearing) to heritage places.
	Water	• Culturally significant water sources are recorded in Fortescue's GIS system as Heritage Places or HRZs, and • IDF designed to avoid Bonnie Pool. • *Aboriginal Cultural Heritage Act 1972* can regulate direct disturbance (e.g. clearing) to water values for cases where these are considered heritage places.
	Plants and Animals	• Areas of culturally significant flora and fauna are recorded in Fortescue's GIS system as Heritage Places or HRZs, • Culturally significant plants or animals which require ongoing management to be included in environmental management plan, and • Implementation of mitigation measures outlined in Chapters 7 and 8.
	Aesthetics and Amenity	• Heritage Places or areas of cultural significance that are dust, noise, visual, or vibration sensitive will be recorded as such in Fortescue's GIS system.
	Access to Country	• Areas requiring access to undertake traditional activities are recorded in Fortescue's GIS system as Heritage Places or HRZs, • Access to Bonnie Pool, creeks and tributaries is maintained, and • Access to Nullagine Mine Haul Road and surrounding area is maintained.
Minimisation	Heritage Places	• Relevant Heritage conditions applied to Land Use Certificates (LUCs) prior to undertaking works in the DE,

Mitigation Hierarchy	Impact topic	Mitigation
		• Undertake Heritage LUC Audits during construction phase and ground disturbing activities (as required), • All personnel mobilised to site to undertake general and site-specific inductions regarding Fortescue's heritage management procedures, • Undertake blasting activities in accordance with Fortescue's Blasting Near Heritage Place Procedure (100-PR-HE-0003), and • Where required, seek heritage approvals under relevant heritage legislation in consultation with Palyku and Nyiyaparli.

	Water	• Proposal designed to minimise impacts to creeks by reducing the number of creek crossings and utilising existing crossings where practical,
		• Where creek crossings are required to provide connectivity to the turbines within the DE, they are designed to:
		  ○ Utilise existing access tracks where possible,
		  ○ Minimise impacts to heritage sites,
		  ○ Maintain flow continuity and prioritise using floodways where possible,
		  ○ Reduce disturbance footprint in watercourses,
		  ○ Minimise gradient of road entry and exit points at crossing locations,
		• Pole locations located outside of high flow areas, where required to be installed within rivers, as far as possible,
		• Turbine locations to avoid major watercourses and associated 1% AEP floodplain area,
		• Turbine hardstand areas and supporting infrastructure to be positioned outside of noted flood prone areas
		• Turbine access track designed to minimise crossings of major watercourses and flow paths, and
		• Implementation of a construction surface water and sediment management plan throughout the construction phase (see Section 10.1.6).

	Plants and Animals	• Ensure consultation with PJAC and KNAC regarding potential impacts to culturally significant plants or animals. • Establish appropriate criteria / thresholds for managing areas of culturally significant plants or animals in high-risk areas, that might be identified (where existing management strategies or procedures may not apply), and

Mitigation Hierarchy	Impact topic	Mitigation
		• Clearing of land kept to a minimum to reduce potential loss of traditional flora species and culturally significant fauna habitat.
	Aesthetics and Amenity	• Implement general dust management protocols (as discussed in Section 7.7.2.6) to minimise dust generated from Fortescue activities in accordance Fortescue Dust Management Plan / Procedure, and • The Proposal has been designed to ensure turbines will not be located on hills or mesas.
	Access to Country	• Ensure consultation with PJAC and KNAC regarding Decommissioning Plan (where required), • Notifications for road closures will be provided to PJAC and KNAC during construction or maintenance activities, and • Access protocol to be developed with Palyku Traditional Custodians for continued access to Bonnie Pool.
Rehabilitation	Plants and Animals / Aesthetics	• Rehabilitation of a total of 480.81 ha (this includes 13.94 ha of areas previously cleared by other activities not related to this Proposal) will be undertaken progressively after each phase of the construction activities to reduce impacts to flora and vegetation over time, including potential fragmentation. This will be undertaken in accordance with Fortescue's standard procedures including Rehabilitation and Revegetation Monitoring Procedure (Reference: 45-GU-EN-0009) provided in Appendix D.

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9.6.2 Non-Aboriginal Heritage

As discussed in Section 9.7.2, no residual impacts from the Proposal are expected on non-Aboriginal heritage including Bonney Downs Homestead and Log Cabin. Therefore, no mitigation measures are required.

9.6.3 Amenity

9.6.3.1 Noise and Vibration

As discussed in Section 9.7.3.1, there is potential for noise levels to exceed legislated thresholds at the Bonney Downs Homestead. Fortescue is committed to mitigating noise exceedances at the Bonney Downs Homestead through the implementation of appropriate mitigation measures including potential modifications to the IDF design, such as the removal of turbines near the homestead, and/or the operational adjustment of wind farm turbines to ensure noise levels remain within the prescribed thresholds during operation. Once these mitigation measures are in place, significant noise impacts on Bonney Downs Homestead are not anticipated.

Mitigation measures related to culturally significant fauna species are provided in Section 9.6.

Vibration resulting from operation of turbines is anticipated to be very low level and likely to be experienced in the immediate vicinity of the turbine.

9.6.3.2 Visual Amenity

As discussed in Section 9.7.3.2, no significant residual visual or landscape impacts from the Proposal have been identified with regard to social surroundings. Therefore, no mitigation measures are proposed.

9.6.3.3 Dust

As discussed in Section 9.7.3.3, no residual dust impacts from the Proposal have been identified to date. Dust deposition will be managed through standard construction management measures (e.g., water application and exposed surface stabilisation) to minimise dust generation and avoid impacts on social surroundings. The following standard dust mitigation measures will be implemented throughout construction phase:

- Use of dust suppression to manage dust generation from construction activities, access roads and cleared areas,
- Use of water sprays to manage dust generation from material transport and stockpiling,
- Limit the number and height of stockpiles, and
- Vehicles confined to designated routes with speed limits strictly enforced.

9.7 Assessment of Impacts

9.7.1 Aboriginal Cultural Heritage and Cultural Values

Assessment of the potential impacts detailed in Section 9.5 is provided below.

9.7.1.1 Heritage Places

Unauthorised removal or damage of Heritage Places and heritage features and unauthorised access to Heritage Places by Fortescue personnel may result in loss of cultural information, loss of connection to ancestors and potential breach of AH Act.

The IDF has been designed to avoid all Heritage Places and HRZs, and minimise impacts to areas of cultural significance (where practicable). If required, Fortescue will seek heritage approvals under the AH Act in consultation with Palyku and Nyiyaparli. **The AH Act process will ensure direct impacts to Heritage Places are avoided or appropriately mitigated** such that significant impacts to Heritage Places from the Proposal are not expected.

9.7.1.2 Water

Fortescue has completed hydrological assessments for the Proposal to evaluate potential impacts on surface water flows and quality, which are discussed further in Section 10.1 (Inland Waters).

Fortescue recognises that water is an important cultural value to both Palyku and Nyiyaparli people. The Proposal has been designed to minimise impacts to creeks (and drainage lines) by adopting the below design criteria:

- Turbine locations to avoid major watercourses and associated 1% AEP floodplain area,
- Turbine hardstand areas and supporting infrastructure to be positioned outside of noted flood prone areas,
- Turbine access track designed to minimise crossings of major watercourses and flow paths.
- Where creek crossings are required to provide connectivity to the turbines within the development, they are designed to:
    - Utilise existing access tracks where possible,
    - Minimise impacts to heritage sites,
    - Maintain flow continuity and prioritise using floodways where possible,
    - Reduce disturbance footprint in watercourses, and
    - Minimise gradient of road entry and exit points at crossing locations.

Palyku raised concerns regarding impacts on groundwater levels for pools within the Proposal area, including Bonnie Pool. Impacts to Bonnie Pool were considered within the GOS (BC-16018-RP-HY-0001) associated with existing DWER licence GWL171278(7), with Bonnie Pool found to be outside the potential zone of influence for impact associated with groundwater abstraction. The current water licence is approved to abstract up to 1.009 GL/yr, which is greater than the needs of the Proposal (maximum of 850 ML/yr).

Both Palyku and Nyiyaparli raised concerns regarding impacts to surface water flow and water quality within the Proposal area and downstream (Table 9-9 and Table 9-10). Based on

feedback received during consultation on the Proposal, the following design changes were implemented:

- Reduction of the total number of major creek crossings,
- Reduction in the size and earthworks required for creek crossings,
- Floodway locations have been prioritised in crossings where possible,
- Redesign of the road network and transmission poles placement away from Bonnie Pool and creek network, and
- Removal of two turbines within 500 m of Bonnie Pool.

Outcomes from the hydrological assessment (Fortescue, 2024b) indicate that the Proposal's impact on surface water flows will be localised, mainly around turbine access tracks and creek crossings, with negligible disruptions to regional flows downstream. The low-level floodway crossings have minor impacts on creek hydrology and morphology, and culverted crossings may alter flow regimes locally but are unlikely to affect areas immediately beyond the structures. This includes the effects on Bonnie Creek, which is not expected to propagate to Bonnie Pool. Through the implementation of a construction surface water and sediment management plan, and standard pollution prevention measures, increases to flood risk and erosion will be minimised and the risk of impacts to water quality will be adequately controlled.

The Proposal may impact surface water quality, potentially leading to poor water quality through activities such as earthworks, transportation of pollutants, treated wastewater, re-fuelling and spills/leaks. Potential impacts from increased sediment loads entering creeks and contamination will be avoided and managed through implementation of surface water mitigation measures (see Section 10.1.6) Therefore, it is unlikely that Proposal activities such as minor earthworks will result in significant impacts.

The hydrological assessment indicates that the potential impacts from the Proposal are expected to be localised, temporary, and are unlikely to result in significant changes to the identified minor and major watercourses (Fortescue, 2025). Furthermore, predicted hydrological changes, including reductions in water depth, are localised and limited to the vicinity of the indicative disturbance area and are not in close proximity to culturally sensitive receptors, including Bonnie Pool.

As such, through the incorporation of design avoidance measures and implementation of mitigation measures, significant impacts to water resources are not anticipated.

9.7.1.3 Plants and Animals

Both Palyku and Nyiyaparli have concerns that the Proposal may result in loss of animal habitats, native (and traditional) plant species, and overall loss of biodiversity within the Proposal area. Both Palyku and Nyiyaparli use the Proposal area for traditional activities such as camping and hunting native animals. Culturally significant species are outlined in Appendix M. Culturally significant species identified during the TEK survey included the Greater Bilby and Pilbara Olive Python, these species are discussed in Chapter 8 (Terrestrial Fauna).

The Greater Bilby and the Pilbara Olive Python were not recorded during the TEK survey, however two records (one within the DE) of Pilbara Olive Python were recorded during the

terrestrial fauna surveys (ecologia, 2025b). The Greater Bilby is not expected to be impacted by the Proposal, as there is a low likelihood of occurrence within the Proposal (refer to Section 8.4.1). A total of 15.87 ha (0.31% of mapped extent in the DE) of Pilbara Olive Python critical habitat will be cleared by the Proposal. However, as the clearing extent equates to less than 1% of the available critical habitat within the DE and there is further suitable habitat in the wider area. Therefore, significant cultural impact is not anticipated for the Greater Bilby or Pilbara Olive Python.

When considering concerns raised around increases in feral species, given the nature of the DE and surrounding area (vast open expanse), it is considered that the Proposal will not significantly increase accessibility to the area for feral animals due to the openness of the current landscape and existing presence of feral animals in the area. Additionally, appropriate waste management will be implemented during construction and operation to ensure food wastes do not increase attraction of feral animals.

The remaining species are not discussed within Chapter 8 (Terrestrial Fauna), as they are common and widespread within the region.

Culturally Significant Flora within Palyku NTD

Thirty-one (31) flora species of cultural significance to the Palyku people have been recorded within the DE in the Palyku NTD area (Appendix M). Only nine species; *Acacia inaequilatera* (2), *Acacia pruinocarpa* (1), *Acacia pyrifolia* var. *pyrifolia* (1), *Aerva javanica* (7), Capparis spinosa subsp. nummularia (1), Cucumis melo (1), *Hakea lorea* subsp. *lorea* (2), *Senna notabilis* (2), and *Vachellia farnesiana* (52) are within the IDF. While these species hold cultural importance, their widespread distribution within Palyku NTD area ensures continued accessibility. As the IDF is limited in extent, it is unlikely to affect the ongoing availability or use of these species by Traditional Owners.

Culturally Significant Flora within Nyiyaparli NTD

No culturally significant plants were identified by Nyiyaparli during consultation, however Nyiyaparli's People and Country Plan (KNAC, 2022) identifies culturally important plants that may occur within the Proposal area. The information from the social surrounds consult aligns with the values that Nyiyaparli have identified through their People and Country Plan (KNAC, 2022). It should be noted that while these species are culturally important, they occur over widespread areas of the Nyiyaparli NTD area.

The clearing of 910.26 ha of native vegetation has the potential to impact plants and animals of cultural significance to the Traditional Owners. The Proposal activities that may impact culturally significant flora and fauna include:

- Vegetation and habitat loss from direct clearing of vegetation in the IDF to accommodate the Proposal infrastructure, including access roads, turbine pads, and substations,
- Fauna mortality and disturbance due to increase vehicle movement during the construction and operational phases,
- Habitat fragmentation and/or behavioural change due to the long-term (~30 years) operation of the wind farm, which includes the turbine movements and operation of the Proposal infrastructure, and

- Behavioural change resulting from disturbance associated with general construction and operational-related activities (i.e., artificial light, noise, increase of human activities).

With regard to the plants recorded in the TEK survey, as detailed in Section 9.4.2.5, during the planning and design process for the Proposal, the mitigation hierarchy (avoid, minimise and rehabilitate) was applied to assess, avoid and minimise potential impacts to flora and vegetation as far as practicable.

The IDF has been designed to avoid areas that may support significant biodiversity values or heritage values, such as avoidance of groundwater dependent and riparian vegetation to minimise disturbance to these vegetation types, as discussed in Chapter 7 (Flora and Vegetation). The flora species of cultural significance recorded in the DE are predominantly all common across the Pilbara region or specifically common through drainage lines or plains which are widespread throughout the DE. The design seeks to avoid major drainage / creek lines except where crossing locations are required. Consultation with Traditional Owners was undertaken to identify creek crossings in order to reduce environmental and heritage impacts.

Additionally, Palyku expressed concern regarding bird collision with turbines, particularly during flocking/migration events which occur cyclically, and the possible increase in feral species that will scavenge on the carrion. This potential impact has been assessed in Chapter 8 (Terrestrial Fauna).

Any disturbance to flora and fauna during construction will be minimised through proposed mitigation measures and standard construction site control measures for noise, lighting, dust and enforcement of speed limits (as discussed in Chapter 7 and 8).

9.7.1.4 Aesthetics and Visual Amenity

Noise and Vibration

Noise and vibration are considered a potential impact to Traditional Owners' ability to enjoy or use Country, and therefore, has the potential to impact traditional activities. Eight locations were selected for baseline noise monitoring for the noise assessment (Talis, 2024).

Construction of the Proposal and the operation of plant and machinery, earthworks and ground disturbing activities will temporarily elevate noise levels. Noise during construction activities is anticipated to remain below the noise threshold levels adopted for cultural receptors, except for Corkbark Spring and Wild Dog Spring (Table 9-12). An access protocol will be implemented for construction works to notify PJAC and KNAC of construction schedules, allowing Palyku and Nyiyaparli to plan their activities in the area accordingly. No significant impacts from construction activities are anticipated given the temporary and localised nature of the proposed activities.

Table 9-12: Noise Model Results (LA10) - Wind Farm Construction

Cultural Receptor	Noise model result LA10 (dB(A))*		Threshold Level (dB(A))
	Clearing	Concreting	
Bonnie Pool	42.5	35.5	50
Cookindina Pool	10.9	4.7	

Cultural Receptor	Noise model result LA10 (dB(A))*		Threshold Level (dB(A))
	Clearing	Concreting	
4 Mile Well	41.0	34.0	
Emu Spring / Well	42.0	36.0	
Daylight Rockhole	20.9	14.3	
18 Mile Pool and Warrabu Site	28.0	22.0	
Mooringinya Spring	40.7	33.6	
Coobinacoola Pools	9.9	3.5	
Minderungumya Hill	29.6	23.6	
Bronzewing Pool	26.5	20.7	
Trig Hill Well	26.0	19.8	
Corkbark Spring	**59.5**	**54.6**	
Wild Dog Spring	**50.4**	45.4	
Tundununya Soak	15.9	8.8	
Cattle Well	47.4	42.3	

***Bold**: refer to threshold exceedances for cultural receptors

Operational noise from the Proposal is anticipated to range from 13 – 55 dB(A) within the DE influenced by wind speed. Noise levels during operations are anticipated to remain below the noise threshold level for all cultural receptors, except for Corkbark Springs when wind speeds exceed 7m/s (Table 9-13). An access protocol will be implemented during operations to allow for PJAC and KNAC to notify of the intent to camp at identified receptors to allow for noise mitigation to be implemented. Given the number of other potential camping locations identified by Palyku in the wider area, this is not considered to be a significant impact to Palyku's ability to undertake traditional activities within the Proposal area.

It should be noted that the Talis (2024) noise assessment modelled up to 200 wind turbines across the DE; however, the current proposal has since been refined to 100 turbines. As a result, any predicted exceedances of noise thresholds may be lower than those reported in the assessment. However, even under the original 200 turbine scenario, no noise impacts were assessed as significant.

Table 9-13: Noise Model Results (LA10) - Wind Farm Operations

Cultural Receptor	Threshold Level (dB(A))	Wind Speed (hub height) *							
		5m/s	6m/s	7m/s	8m/s	9m/s	10m/s	11m/s	12m/s
Bonnie Pool	50	31.7	35.7	39.0	40.6	41.5	41.8	41.8	41.8
Cookindina Pool		14.1	18.1	21.4	23.0	23.9	24.2	24.2	24.2
4 Mile Well		13.9	17.3	20.6	22.3	23.1	23.4	23.4	23.4
Emu Spring / Well		26.5	30.0	33.2	34.9	35.7	36.0	36.0	36.0
Daylight Rockhole		18.9	22.7	26.0	27.6	28.5	28.8	28.8	28.8
18 Mile Pool and Warrabu Site		21.6	25.5	28.8	30.4	31.3	31.6	31.6	31.6
Mooringinya Spring		32.6	36.5	39.8	41.5	42.3	42.6	42.6	42.6
Coobinacoola Pools		20.7	24.6	27.9	29.6	30.4	30.7	30.7	30.7
Minderungumya Hill		25.0	29.0	32.3	33.9	34.8	35.1	35.1	35.1
Bronzewing Pool		19.0	22.9	26.2	27.9	28.7	29.0	29.0	29.0
Trig Hill Well		21.7	25.5	28.8	30.5	31.3	31.6	31.6	31.6
Corkbark Spring		45.0	49.0	**52.3**	**53.9**	**54.8**	**55.1**	**55.1**	**55.1**
Wild Dog Spring		39.1	42.9	46.2	47.8	48.7	49.0	49.0	49.0
Tundununya Soak		12.8	16.7	20.0	21.6	22.5	22.8	22.8	22.8
Cattle Well		35.9	39.8	43.2	44.8	45.7	46.0	46.0	46.0

***Bold**: refer to threshold exceedances for cultural receptors

Temporary vibrations will occur mainly due to construction activities including operation of construction plant and machinery, earthworks and general ground disturbing activities. It is not anticipated that a significant amount of blasting will take place. The vibration from construction activities will be temporary and is not expected to significantly impact Aboriginal Cultural Heritage. Any vibration from blasting activities (where undertaken) will be managed under Fortescue's 'Blasting Near Heritage Places Procedure' (100-PR-HE-0003) (this procedure is not included as an appendix to this report due to its confidential nature).

As such, significant impacts to Aboriginal Cultural Heritage and Cultural Values due to noise or vibration are not expected. General noise impacts associated with amenity are discussed further in Section 9.7.3.1.

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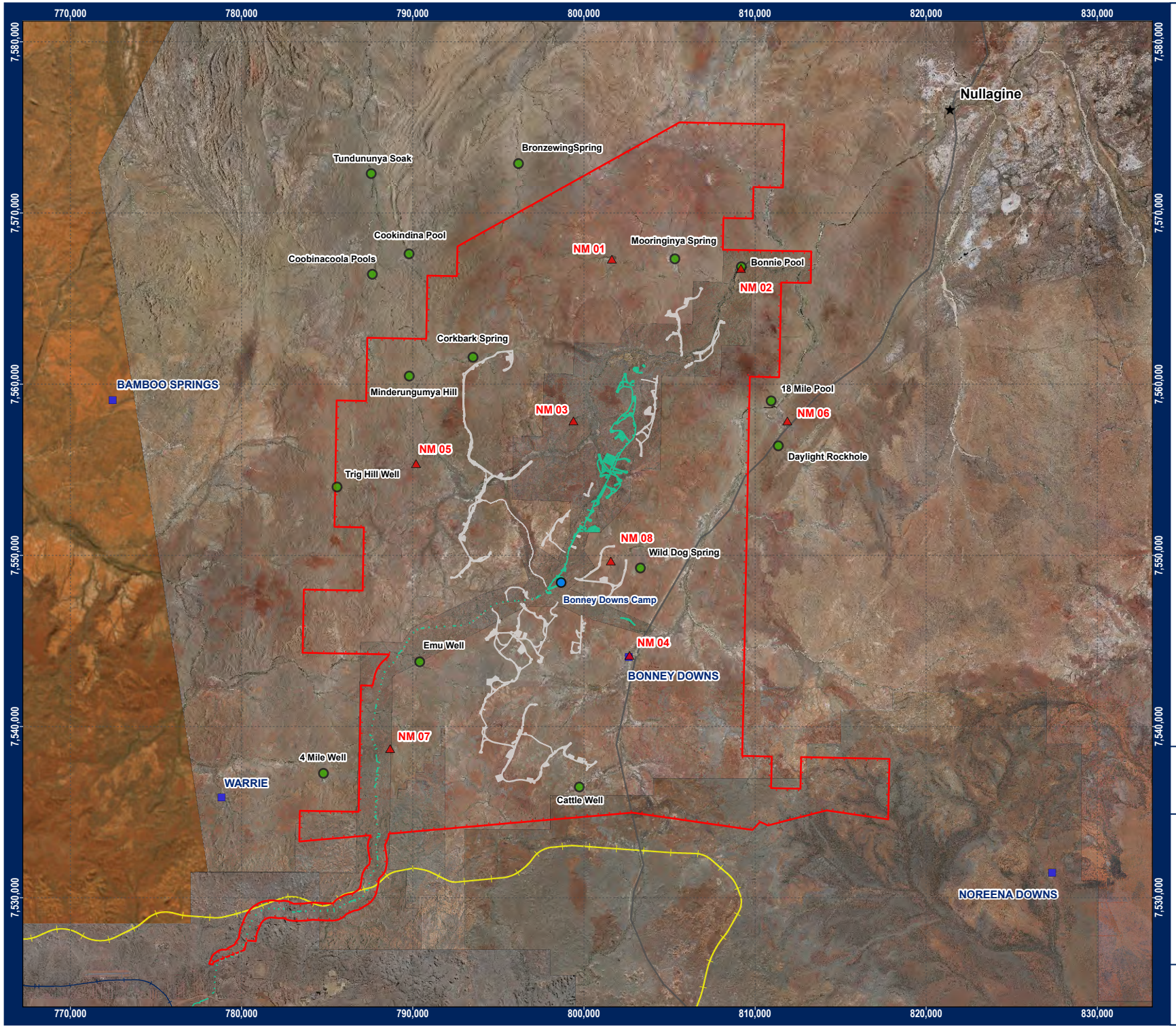

Legend

- Development Envelope
- GOV Towns
- Major Roads
- Fortescue Rail
- Roy Hill Rail
- Indicative Disturbance Footprint
- Approved Disturbance (Nullagine Pilot Wind Farm)
- Noise Monitoring Locations
- Palyku Cultural Receptors

Receptors

- Bonney Downs Camp
- Bonney Downs Homestead
- Nullagine Town

Data Source(s):
Aerial, Fortescue and ESRI
All other data, Fortescue, 2025

N

0 2 4 6 8 10
Kilometers

Figure 9-6
Baseline Noise Monitoring Locations

Requested By: R. Dorji
Drawn By: R. Kerr
Revised By: rykerr
Approved By:
Scale: 1:300,000
Coordinate System: GDA 1994 MGA Zone 50
Project Name: 4519OP002_MP_EN_0093_PartIV_3
Document Name: 4519OP002_MP_EN_0093_033_r0_Noise

Date: 1/30/2026
Size: A4L
Revision: 0
Confidentiality: 0

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Visual Amenity

Maintaining the aesthetics at culturally significant areas and wider cultural landscape within and surrounding the Proposal was identified as a key value by Traditional Owners. Potential visual impacts on the use of cultural places were also considered in regard to maintaining visual amenity and use of country. The VIA for the Proposal considered the following scenarios:

- Before construction (current state),
- During operations,
- After decommissioning, and
- 50-year post decommissioning.

The VIA (SLR, 2025b) concluded that, turbines within the landscape will affect the existing visual character of the area; however, the natural landscape remains dominant. The Proposal will not result in the alteration or disruption to valued landscape characteristics, including rivers, major waterways, or ranges. These key features remain physically unaffected and largely visually unaffected during the operational phase of the Proposal. Given the design changes already made and that Palyku and Nyiyaparli can still access the area to undertake traditional activities and visit cultural places, significant impacts to Aboriginal Cultural Heritage and Cultural Values are not expected. Visual impacts associated with amenity are discussed further in Section 9.7.3.2.

Dust

No specific concerns were raised during consultation with Palyku or Nyiyaparli regarding dust. However, high levels of dust may have an impact on Traditional Owner's ability to enjoy and use specific places within the Proposal area for traditional activities.

Dust emissions are expected to be generated by construction activities, vehicle movements, and wind erosion during the construction phase and during operations from reduced vegetation cover. Nuisance dust could affect dust-sensitive receptors during construction activities, however, will be short term and localised. Dust generation during operations is not anticipated to be significant and localised around cleared areas from infrastructure (GHD, 2025). Potential impacts to Bonnie Pool are not anticipated during construction or operations with implementation of proposed management measures.

Fortescue proposes to manage dust emissions during construction and operations (where required) by implementing the Dust Management Plan (IO-PL-EN-0001, Dust management efforts will primarily be focused during the construction phase, with minimal impacts anticipated during operations. Consequently, dust generation and deposition can be minimised and largely contained within the construction period of the Proposal.

As such, significant impacts to Aboriginal Cultural Heritage and Cultural Values due to dust emissions are not expected. Dust emissions associated with amenity are discussed further in Section 9.7.3.3.

9.7.1.5 Access to Country

Reduced access to Country may result in loss of connection to Country and cultural practices. Both Palyku and Nyiyaparli raised concerns about continued access to the Proposal area for hunting purposes. Palyku identified Bonnie Pool as an importance place used for camping and hunting. Access to Bonnie Pool will be maintained throughout the operation of the Proposal. Temporary access restrictions to Bonnie Pool may occur during construction phase, as will access to the broader area used by Palyku and Nyiyaparli for hunting. Inconveniences from temporary access restrictions during construction will be managed through an Access Protocol, notifying Palyku and Nyiyaparli (through their representative bodies PJAC and KNAC) of construction schedules for the Proposal to plan visiting the area accordingly.

Based on the hunting area locations provided by Palyku during social surrounds consultation, six main land types were identified, of which five occur within the DE and four within the IDF (Table 9-14). The extensive availability of hunting grounds is supported by large areas of suitable land types, which provide suitable access for hunting across Palyku's Native Title Determination.

While some overlap exists within the DE, the proportion of disturbance remains minimal (Table 9-14). The 'stony plains and hills with spinifex grasslands' exhibit a 53.68% overlap with the DE, however only 1.31% of the IDF intersects this land type, suggesting that essential hunting areas will still be accessible.

Additionally, the stony plains with spinifex grasslands (240,285.46 ha) remain entirely undisturbed from the Proposal (Table 9-14), further preserving viable hunting grounds. Given the preference for these land types and their continued availability for access, along with the minimal impact on fauna species (see Chapter 8), suggests that key prey populations will remain stable, supporting ongoing hunting activities. Therefore, hunting practices are unlikely to be significantly affected by the Proposal.

Table 9-14: Hunting Area Land Types

Land Type	Area (ha)			Proportion of Overlap with Palyku Determination (%)	
	Palyku Determination	Development Envelope	Indicative Disturbance Footprint	Development Envelope	Indicative Disturbance Footprint
Hills and ranges with spinifex grasslands	540,744.42	58,437.42	363.59	10.81%	0.07%
Plateaux, mesas and breakaways with spinifex grasslands	68,326.99	4,320.07	44.9	6.32%	0.07%
Stony plains and hills with spinifex grasslands	33,165.51	17,802.21	433.19	53.68%	1.31%
Stony plains with spinifex grasslands	240,285.46	-	-	0.00%	0.00%

Land Type	Area (ha)			Proportion of Overlap with Palyku Determination (%)	
	Palyku Determination	Development Envelope	Indicative Disturbance Footprint	Development Envelope	Indicative Disturbance Footprint
Stony gilgai plains with tussock grasslands and spinifex grasslands	29,524.77	7,469.58	98.54	25.30%	0.33%
River plains with grassy woodlands and shrublands, and tussock grasslands	15,861.70	499.69	-	3.15%	0.00%

Some operational restrictions may apply within close vicinity of wind turbines for the use of firearms for hunting. Access protocols will be discussed and implemented with PJAC and KNAC. As such, a significant impact to Palyku and Nyiyaparli from changes to access to Country is not expected.

9.7.2 Non-Aboriginal Heritage

The DE intersects the current boundary of the Bonney Downs Homestead and Log Cabin; however, it does not overlap with the IDF, being approximately 2.5 km from the nearest disturbance area. Therefore, no direct impacts to Bonney Downs Homestead and Log Cabin are expected. Potential indirect impacts due to noise and vibration, visual amenity and dust are discussed further in Section 9.7.3.

9.7.3 Amenity

9.7.3.1 Noise and Vibration

Noise modelling for construction activities included the simulation of clearing and concreting activities and their related equipment. Operational activities include the wind turbine activities at different speeds. The completed methodology for the noise model is described in Section 4.2 ‘Noise Model Inputs’ of Appendix N.

Three sensitive receivers were identified which include Bonney Downs Homestead, Nullagine townsite and the Proposed Bonney Downs Camp. Bonnie Pool was identified as a cultural receptor for Palyku and is discussed in Section 9.7.1.4.

The noise assessment concluded that none of the sensitive receivers would exceed the assigned threshold levels during construction activities (Table 9-15).

Table 9-15: Noise Model Results (LA10) - Construction

Receiver	Closest WTG Tag Number	Noise model result LA10 (dB(A))*		Threshold Level (dB(A))
		Clearing	Concreting	
Noise sensitive receivers				
Bonney Downs Homestead	WT106	**38.9**	33.4	35
Nullagine Town	WT183	8	<1	
Proposed Bonney Downs Camp	WT068	**42.4**	37.0	40

***Bold**: refer to threshold exceedances for cultural receptors

During the operational phase, predicted noise levels remain below threshold levels for Nullagine Town. However, the Bonney Downs Homestead and the Proposed Bonney Downs Camp are anticipated to exceed noise Thresholds (Table 9-16).

Baseline noise monitoring near Bonney Downs Homestead ranged from 35 dBa during the day, 31 during the evening and 32 at night (Table 9-8). In the worst-case modelled scenario, wind turbines may exceed noise threshold levels at the Bonney Downs Homestead when wind speeds exceed 6 m/s and the Proposed Bonney Downs Camp will exceed noise thresholds from 5 m/s (Table 9-16).

Given the average wind speeds of approximately 8 m/s within the DE and a prevailing east-south-east wind direction, operational noise from the wind turbines is expected to be partially masked. At higher wind speeds, the increased sound of wind moving through vegetation further diminishes turbine noise, reducing potential impacts on nearby receptors. Noise modelling is underway to refine design and mitigation strategies for Bonney Downs Homestead, while the Proposed Bonney Downs Camp will be relocated outside the affected area to minimize noise exposure. As a result, noise impacts on nearby receptors during operation are anticipated to be reduced.

Table 9-16: Noise Model Results (LA10) - Wind Farm Operations

Receiver	Threshold Levels	Wind Speed (hub height)*							
		5m/s	6m/s	7m/s	8m/s	9m/s	10m/s	11m/s	12m/s
Noise sensitive receivers									
Bonney Downs Homestead	35	31.0	**35.6**	**38.5**	**40.2**	**41.0**	**41.3**	**41.3**	**41.3**
Nullagine Town		<5	8.0	12.0	14.5	15.6	15.7	15.7	15.7
Proposed Bonney Downs Camp	40	**37.0**	**42.8**	**44.5**	**46.1**	**46.7**	**47.2**	**47.2**	**47.2**

***Bold**: refer to threshold exceedances for cultural receptors

Vibration impacts from blasting are not expected to exceed the thresholds for the Bonney Downs Homestead, Nullagine Town or the Proposed Bonney Downs Camp. Vibration resulting from the operation of turbines is anticipated to be very low level and likely to be experienced only in the immediate vicinity of the turbines.

Culturally Significant Fauna

Talis (2025) was engaged to quantify received noise levels and assess the potential impacts of WTG noise on culturally significant fauna, including kangaroos, emus, and echidnas. Noise from the WTG may potentially impact these species by causing physical injury to their hearing, inducing behavioural changes due to disturbance, or creating masking effects that reduces their ability to hear, communicate, or detect predators.

There is no risk of physical injury to culturally significant fauna from WTG noise; however, there is some potential risk that Kangaroos and Emus may experience reduced ability to hear, communicate, or detect predators in localised areas close to the turbines, particularly at higher wind speeds (Talis 2025). The risk increases between 5 m/s (when turbines start turning) and 10 m/s (when turbines make loudest noise). Beyond 10 m/s, the background noise produced by wind becomes too high, and turbines noise is unlikely to interfere with their ability to communicate or detect predators. Echidnas are not expected to be impacted by the noise.

9.7.3.2 Visual Amenity

Landscape Assessment

The potential impacts on LCUs are summarised in Table 9-17. LCUs 1 to 3 are expected to experience minor to moderate impacts on the landscape, while the remaining LCUs are not anticipated to be affected. This is due to either their low landscape value (LCU 4) or the absence of magnitude of change (LCUs 4 and 5).

The magnitude of change to the landscape character is determined by factors such as the intensity, nature, scale, extent and duration of the impacts, and modification of features within the existing landscape. It is also based on the type of landscape most susceptible to change before the implementation of any mitigation measures.

The impact of the Proposal on landscapes is predicted to be minor-moderate. The overall impact to the landscape is not considered significant, given that the natural LCU occurs widely outside of the DE (SLR, 2024b).

Table 9-17: Landscape Assessment Results (SLR, 2024b)

LCU	Land uses	Landscape Value	Magnitude of Change	Landscape Impact
LCU 1 – Plains	Mineral exploration, pastoralism, and transportation. This landform is also likely used for traditional activities such as hunting and camping by native title holders	Medium	Low	Minor-Moderate
LCU 2 – Range, Hills and low rises	Mineral exploration, pastoralism, and transportation. This landform is also likely used for traditional activities such as hunting and camping by native title holders.	Medium	Low	Minor-Moderate
LCU 3 – Major Waterways and drainage lines	Pastoralism. This landform is also likely used for traditional activities such as hunting and camping by native title holders.	High	Negligible	Minor-Moderate
LCU 4 – Mining and infrastructure	Mineral exploration, mining and pastoralism. This landform may also be used for traditional activities by native title holders.	Low	None	None

LCU	Land uses	Landscape Value	Magnitude of Change	Landscape Impact
LCU 5-Townsites and residential	Dominated by non-natural surfaces of built form and the disturbed or bare soils of various colours, often with vegetation in the foreground or background.	High	None	None

Viewpoint Assessment

Thirteen POIs were selected for the VIA. These POIs are key viewpoints from which the landscape is experienced, and their sensitivity to changes in visual amenity was evaluated to determine potential impacts (SLR, 2024b). As discussed, several of the POIs selected (particularly those in the northern part of the DE), are now located farther from the Proposal elements than they were at the time of assessment. Therefore, the results assess a scenario worse than is, with some of the negative impacts identified likely to be reduced.

Of the 13 POIs, the following are now located farther from the closest turbine than they were previously:

- VIA_A: previously 0.7 km northwest from the Proposal's closest turbine, now 9.4 km from the Proposal's closest turbine.
- VIA_B: previously 1.6 km north-northeast from the Proposal's closest turbine, now 2.5 km from the Proposal's closest turbine.
- VIA_C: previously 5.2 km west from the Proposal's closest turbine, now 7.7 km from the Proposal's closest turbine.
- VIA_G: previously 2.3 km north-northeast of the Proposal's closest turbine, now 3.2 km from the Proposal's closest turbine.
- VIA_H: previously 5.9 km southeast of the Proposal's closest turbine, now 7.8 km from the Proposal's closest turbine.
- VIA_J: previously 0.5 km southwest of the Proposal's closest turbine, now 0.9 km from the Proposal's closest turbine.
- VIA_K: previously 7.3 km southwest west-southwest of the Proposal's closest turbine, now 8 km from the Proposal's closest turbine.
- VIA_L: previously 12.8 km southwest of the Project's closest turbine, now 13.5 km from the Proposal's closest turbine.
- VIA_M: previously 9.4 km east from the Proposal's closest turbine, now 12.7 km from the Proposal's closest turbine.

VIA_D, VIA_E, VIA_F, VIA_I remain unchanged in terms of distance to closest turbine. VIA_E was previously intersecting the IDF however, and now is not.

Of those 13 POIs, all but one (VIA_M), were predicted to have visibility of the Proposal. Implementation of the Proposal is predicted to result in a minor to moderate impact to 11 of

the assessed POIs surrounding the Proposal, with one (VIA_G) resulting in a moderate to high impact (SLR, 2024b) (Table 9-18). However, as noted above this POI is now 0.9 km further from the closest turbine than it was when assessed. Therefore, this impact is likely to be reduced.

Bonney Downs Homestead was assessed from VIA11, and pre-development is a predominantly natural view with some modified elements including Bonney Downs Station tracks and laydown areas in the foreground to midground. The predicted view is a partly natural view and partly modified view, with modified elements including the Bonney Downs Station tracks and laydown areas and the Proposal's wind turbines. The implementation of the Proposal results in an alteration of the nature of the view due to the clearly perceptible and wide-ranging change in the midground to background of the view.

Table 9-18: Summary of Visual Impact Ratings (SLR, 2024b)

POI	POI Sensitivity	Magnitude of Change	Impact Rating	Location/ View
VIA_A	Medium	Moderate	Moderate	View of unnamed track on Bonney Downs Station, 0.7 km northwest from the Proposal's closest turbine in the view.
VIA_B	Medium	Moderate	Moderate	View close to Bonnie Pool, 1.6 km north-northeast from the Proposal's closest turbine in the view.
VIA_C	Medium	Moderate	Moderate	View from Bonney Downs-Hillside Road on Hillside Station, 5.2 km west from the Proposal's closest turbine in the view.
VIA_D	Medium	Moderate	Moderate	View from Bonney Downs-Hillside Road on Bonney Downs Station, 3.1 km northwest from the Proposal's closest turbine in the view.
VIA_E	Medium	Moderate	Moderate	View from Bonney Downs-Hillside Road, 1 km southwest of the Proposal's closest turbine in the view.
VIA_F	Medium	Low	Minor-moderate	**Marble Bar Road** View from Marble Bar Road, 5.9 km southeast of the Proposal's closest turbine in the view.
VIA_G	**High**	Moderate	**Moderate-high**	**Bonney Downs Station Homestead; Marble Bar Road** View from the Bonney Downs Homestead, 2.3 km north-northeast of the Proposal's closest turbine in the view.
VIA_H	Medium	Negligible	Minor	**Bonney Downs-Noreena Road** View from Bonney Downs-Noreena Road, 5.9 km southeast of the Proposal's closest turbine in the view.
VIA_I	Medium	Moderate	Moderate	**Marble Bar Road** View from Marble Bar Road, 3.1 km southeast of the Proposal's closest turbine in the view and approximately 2 km north of Soda Spring.
VIA_J	Medium	Moderate	Moderate	View from a station track on Bonney Downs Station parallel to Nullagine Mine Haul Road, 0.5 km southwest of the Proposal's closest turbine in the view

POI	POI Sensitivity	Magnitude of Change	Impact Rating	Location/ View
VIA_K	Medium	Negligible	Minor	View from Nullagine Mine Haul Road, 7.3 km southwest west-southwest of the Proposal's closest turbine in the view
VIA_L	Medium	Low	Minor-moderate	View from Nullagine Mine Haul Road, 12.8 km southwest of the Project's closest turbine.
VIA_M	**High**	None	None	**Nullagine River** View close from Nullagine River, 9.4 km east from the Proposal's closest turbine.

The VIA concluded that overall, alteration to visual amenity will be widespread, however the natural landscape will remain dominant and not result in the alteration or disruption to valued landscape characteristics, including rivers, major waterways, or ranges. These key features remain physically unaffected and largely visually unaffected during the operational phase (SLR, 2024b).

The outcomes of the shadow flicker assessment concluded that the Bonney Downs Station Homestead and all POIs will not be impacted above threshold levels, and therefore potential impacts are not considered significant (SLR 2024b).

Minimal operational lighting will be required on-site, and potential night- time light impacts are not expected to be significant. The night-time light assessment indicated that, due to the large distances to sensitive receivers, there is negligible to nil risk of exceeding the light spill limit (SLR, 2024); therefore, it is not expected to be a significant impact. Additionally, red flashing lights on turbine nacelles, required for aviation safety in consultation with the Civil Aviation Safety Authority, may be visible from sensitive receptors and POIs; however, any illumination from these would be minimal (SLR, 2024b).

At the Proposal's end of life, the wind farm and all infrastructure will be decommissioned. Therefore, following vegetation rehabilitation, no significant changes to the visual landscape are expected.

The Proposal is considered likely to meet the project-specific VMOs due to the following:

- The Project does not result in a dominant change in view for the POI that are located > 1 km from the Project, nor for POI < 1 km from the Project,
- The Project does not result in the removal of valued characteristics, such as major waterways or isolated rounded hills. Nor does it result in significant alteration or disruption to views of these, and
- Turbines are visually apparent within the visual catchment area and in some views are a major element however the natural landscape remains the dominant characteristic.

9.7.3.3 Dust

The dust assessment (GHD, 2025) concluded that air quality will comply with relevant criteria for all assessed pollutants (PM10, PM2.5, and Total Suspended Particulates) for construction and operation scenarios through implementation of proposed management measures (Section 9.6.3.3). It should also be noted that since this dust assessment the clearing required

has being substantially reduced from 2,044 ha to 944.07 ha. Therefore, less dust will be generated during construction.

To further mitigate dust generation during construction, standard best practice measures outlined within the EMP (Appendix B) will be implemented. Due to the remote location of the DE and the limited number of other sensitive receptors nearby, the risk of significant dust impacts is considered low.

Impacts associated with dust on Aboriginal Cultural Heritage and Cultural Values are discussed in Section 9.7.1.4.

9.7.4 Cumulative Impacts

Cumulative environmental impacts are the successive, incremental, and interactive impacts on the environment of projects with one or more past, present and reasonably foreseeable future activities (EPA, 2023a). This section outlines the potential cumulative impacts to social surroundings as a result of the Proposal and other surrounding developments either recently approved or currently under assessment.

In undertaking a cumulative impact assessment, the following assumptions are noted:

- Cumulative impacts resulting from third-party operations are based on information available in the public domain for third party operators and does not encapsulate impacts for all third-party operations in the region,
- Cumulative impact calculations generally do not take into consideration areas outside of those assessed under Part IV of the EP Act, or EPBC Act referrals, for each relevant proposal. Where relevant, large clearing permits under Part V of the EP Act may also be included depending on the quantity and quality of information available, and
- The accuracy of data from external sources will not be verified and it is assumed that data publicly available is accurate and collected in accordance with standard industry guidelines.

There are several reasonably foreseeable developments within the Proposal area and the broader region, including the Chichester subregion of the Pilbara bioregion. With respect to noise, dust and visual impacts, implementation of any single project may not significantly impact a sensitive receptor. However, a combination of current and reasonably foreseeable future projects may generate cumulative emissions or changes to views that are above acceptable levels. The only identified receptors in close proximity to the DE are associated with Traditional Owner use of the area (both Palyku and Nyiyaparli) and Bonney Downs Homestead. No similar Proposal is located near Bonney Downs Homestead. Given this, cumulative impacts were assessed based on potential impacts to cultural values.

The following active projects have been identified as potentially relevant cumulative developments given, they are within the same Native Title Determination Areas and have not yet commenced construction or are still under construction:

Palyku People

- Mulga Downs Hub and Rail Spur.

Nyiyaparli People

- Nyidinghu Iron Ore Mine,
- Rhodes Ridge Iron Ore Project,
- Jimblebar Hub Significant Amendment,
- Hope Downs 2,
- Mining Area C - Southern Flank, and
- Mindy South Iron Ore Mine.

There is limited information available for the majority of the above developments in relation to noise, dust, access, or visual amenity impacts on cultural values. Furthermore, it is noted that these projects are mostly related to mining operations and therefore are considered to have substantially different impacts to the Proposal. The cumulative developments associated with copper/gold and iron ore mines having acute, long-lasting impacts that are not specifically comparable to that of a wind farm development for which impacts from dust, noise, and access are short term during construction and otherwise considered to be insignificant. The potential for amenity impacts associated with a large-scale wind farm are predominantly associated with visual impacts, for which the mining operations are considered to have lower potential or limited information on their impacts on visual amenity. Therefore, the Proposal is not anticipated to have any potential for cumulative impacts with regards to noise, dust, access or visual amenity.

Palyku and Nyiyaparli have raised general concerns on impacts on waterways and water flows. Due to the minor nature of the creek crossings, regional surface water flows are not expected to be disrupted. Therefore, the Proposal is unlikely to modify the hydrology and morphology of watercourses within, and downstream of the DE. As a result, impacts are expected to be low, with any potential effects on major waterway flow regime expected to be minor and localised. Consequently, no combined cumulative impacts to regional surface water flows are expected.

Additionally, the Proposal is situated within four different catchments, only one of which, the Fortescue Upper River, contains other proposals that could result in cumulative impacts. All of these other proposals fall within the Nyiyaparli Native Title area. Given that only a single turbine from the Proposal is located in Fortescue Upper River catchment, cumulative impacts in this catchment are not likely to occur.

9.8 Environmental Outcomes

Table 9-19 summarises the expected environmental outcomes for the Revised Proposal, following the implementation of mitigation and management measures. The environmental outcomes proposed are mainly outcome-based conditions. However, environmental objectives are proposed in some cases as outcome based conditions are not practical due to the outcome depending on consultation with Traditional Owners. Additionally, some objectives are dependent on the implementation of management plans related to other key environmental factors.

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Table 9-19: Summary of Residual Impacts for Social Surroundings after Mitigation Measures

Theme/Topic	Concerns/Queries raised by Traditional Owners	Potential Impact	Potential consequence	Proposed Environmental Outcome
Direct Impacts				
Heritage Places	• Unauthorised disturbance to Heritage Places and objects within the DE. • Unauthorised access by Fortescue personnel and contractors.	• Removal or damage to cultural material, including engravings and grinding materials.	• Loss of cultural information and connection to ancestors. • Potential breach of AH Act (WA) for unauthorised impact to heritage sites.	**SS-1 Environmental Outcome:** No unauthorised disturbance to Aboriginal cultural heritage sites in the development envelope, unless consent is granted to disturb that site under WA legislation which specifically relates to Aboriginal heritage and has required informed consultation with relevant Traditional Owners. **Management of potential impacts to Aboriginal Cultural Heritage Sites in the Development Envelope is regulated under the under the Aboriginal Heritage Act**
Plants & Animals	• Concern expressed about bird collision with turbine and expected increase in feral animals • General concern expressed about native plants and animals, and maintaining the overall biodiversity of the area. • Avoid disturbance to mesas, identified by Palyku as a place of important animal habitat.	• Loss native birds and bats or changes to migratory patterns • Loss of biodiversity of native plant and animal species. • Inability to access areas for traditional activities (e.g. resource gathering / hunting)	• Loss of culturally significant animals and plants used for traditional purposes (e.g. medicine, bush tucker, hunting)	As per environmental objectives FV-5 and TF-3
Water	• General concerns on impact on waterways and flows from springs, river and creek catchments, waterholes and creeks.	• Disturbance to creek lines or banks from proposed crossings or widening of	• Loss of healthy waterways and Country • Potential breach of AH Act (WA) for unauthorised impact to heritage sites (where	No condition required as no significant impact anticipated. **Management of potential impacts to surface water and groundwater is regulated under the RIWI act.**

Theme/Topic	Concerns/Queries raised by Traditional Owners	Potential Impact	Potential consequence	Proposed Environmental Outcome
	• Impacts on water sources perceived to have been impacted by Nullagine Iron Ore Project. • Disturbance to Bonnie Pool.	existing tracks over creeks. • Loss or reduction in water flow to creeklines • Loss of Bonnie Pool.	water sources are recorded as Heritage Places).	
Indirect Impacts				
Dust	• General concern around dust emissions from the Proposal.	• Increased dust from construction and operation reducing aesthetics at culturally significant areas and the wider cultural landscape. • Decline of plant health for culturally significant flora in high-risk areas.	• Loss of enjoyment of country. • Loss of culturally significant animals and plants used for traditional purposes (e.g. medicine, bush tucker, hunting)	As per environmental objective FV-5 **Management of potential impacts from dust is currently regulated under the Mining Act.** **SS-2 Environmental objective:** The proponent must undertake ongoing consultation and engagement with relevant Traditional Owners about the achievement of the outcomes and objectives SS-1, FV-5 and TF-3 for the life of the proposal. The proponent must take reasonable steps to consult with relevant Traditional Owners when revising the following environmental management plans: (1) Bonney Downs Environmental Management Plan (2) Bonney Downs Bird and Bat Adaptive Management Plan
Noise and vibration	• Vibration from operating wind turbines affecting native animals. • Excessive noise levels impacting ability to undertake traditional activities at Bonnie Pool or surrounding areas	• Reduced use of the area for traditional activities due to noise from construction. • Permanent loss of access to areas for traditional activities due to noise from operation. • Noise and Vibration from operating wind turbines resulting in altered animal behaviour.	• Loss of connection to Country and culture in this area.	

Theme/Topic	Concerns/Queries raised by Traditional Owners	Potential Impact	Potential consequence	Proposed Environmental Outcome
Visual amenity	• Request to keep infrastructure (turbines, poles) off mesas and hills. • Being able to see wind turbines from Bonnie Pool	• Reduced aesthetics at culturally significant areas and wider cultural landscape. • No longer use or visit the area to undertake traditional activities.	• Loss of natural landscape and connection to Country and culture in this area.	No condition required as no significant impact anticipated.
Access to Country	• Maintain access to the development area. • Maintain access to Bonney Downs area as a place used for camping and hunting.	• Reduced use of the area or inability of access the area for traditional activities resulting in loss of connection to Country and cultural practices.	• Loss of connection to Country and culture in this area.	**SS-3: Environmental outcome:** Subject to implementation of health and safety protocols, no interruption of ongoing access to land utilised for traditional use or custom by relevant traditional owners.
Water	• Impacts to water flow and quality of rivers, Bonnie Pool and creek lines.	• Altered hydrological regime of rivers and creek lines impacting health of waterways and natural characteristics.	• Loss of healthy waterways and Country • Cultural responsibility for downstream impacts on neighbouring language group Country.	No condition required as no significant impact anticipated. **Management of potential impacts to surface water and groundwater is regulated under the RIWI act.**

No significant residual impacts to Social Surroundings have been identified and the EPA's objective for the Social Surroundings factor 'to protect social surroundings from significant harm' can be met.

10 OTHER ENVIRONMENTAL FACTORS

As discussed in Chapter 6, some environmental factors were eliminated from further assessment given there are no credible impact pathways identified, such as the marine related factors. Other environmental factors were identified as requiring a less detailed assessment than the preliminary key environmental factors as they are either subject to controls under other legislation, are effectively managed through routine/business as usual environmental management procedures, or the Proposal poses a very low risk of impact to these factors. The factors requiring a less detailed impact assessment are:

- Inland Waters,
- Terrestrial Environmental Quality, and
- Landforms.

10.1 Inland Waters

10.1.1 EPA Objective

The WA EPA's objective for the Inland Waters environmental factor is '*to maintain the hydrological regimes and quality of groundwater and surface water so that environmental values are protected*' (EPA, 2018).

Inland Waters are defined as '*The occurrence, distribution, connectivity, movement, and quantity (hydrological regimes) of inland water including its chemical, physical, biological and aesthetic characteristics (quality)*' (EPA, 2018).

10.1.2 Policy and Guidance

The following policies and guidelines have been considered for the Proposal in order to meet the EPA's objective in relation to this factor:

- Statement of Environmental Principles, Factors and Objectives (EPA, 2023b),
- Environmental Factor Guideline – Inland Waters (EPA, 2018),
- Water Quality Protection Note No. 25. Land use compatibility tables for public drinking water source areas (DWER, 2021a),
- Water Quality Protection Note No. 28. Mechanical servicing and workshops (DoW, 2013),
- Water Quality Protection Note No. 65. Toxic and hazardous substances (DoW, 2015),
- Water Quality Protection Note No. 84. Rehabilitation of disturbed land in public drinking water source areas (DoW, 2009), and
- Assessment and management of contaminated sites (DWER, 2021c).

The Environmental Factor Guideline for Inland Waters has been considered during the identification of values within the DE, and the issues identified in the guideline considered in relation to potential impacts from the Proposal.

10.1.3 Studies and Surveys

A baseline hydrology assessment (Advisian, 2023) was completed for the proposed wind farm area and is provided in Appendix R. This assessment was undertaken to develop an understanding of surface water behaviour within and surrounding the project, to support preliminary layout/design of wind turbines, associated infrastructure and approvals.

A post development hydrology study was then completed for the generation area (wind power) (Fortescue, 2024) and is provided in Appendix S. This assessment evaluated the potential changes to existing surface water flow regime as a result of the Proposal. The report involved hydraulic modelling to estimate surface water flow characteristics, including flow volumes, flood depths and velocities, an impact assessment and recommendations for mitigations. Note this study was completed for a much larger disturbance footprint than the current Proposal (which has subsequently been reduced through implementation of the mitigation hierarchy to avoid environmental values),and therefore reports a substantially worse case in terms of impacts than the Proposal.

10.1.4 Limitations

No limitations were listed within the hydrology assessments (Advisian, 2023; Fortescue, 2025; Fortescue, 2024).

10.1.5 Receiving Environment

10.1.5.1 Surface Water

The DE is located within the Pilbara Surface Water Area proclaimed under the RIWI Act (DWER, 2018a). No Public Drinking Water Source Areas are located within the DE, however the Nullagine Water Reserve (Priority 1 and Priority 3), is located approximately 2 km east of the northern section of the DE (DWER, 2024a).

The DE occurs within the De Grey River and Fortescue River basins and overlaps four catchments: (1) Nullagine River, (2) Coongan River, (3) Shaw River and (4) Fortescue River (DWER, 2024c). The Proposal infrastructure within the DE overlaps the Shaw River, Nullagine River and Fortescue River catchments. The DE is located within the headwater areas of these catchments.

The Nullagine River, Coongan River and Shaw River generally flow in a northerly direction towards the De Grey River, approximately 200 km downstream of the DE. Surface water in the southern section of the DE flows from north to south towards the Fortescue River (Fortescue, 2025) with minor watercourses within the southern area of the DE flowing towards the Fortescue Marsh, located approximately 9 km from the DE and 25 km from nearest wind turbine. The upper Fortescue River (as well as direct rainfall) contributes the majority of surface runoff to the Fortescue Marsh (Skrzypek *et al.,* 2013). The Fortescue Marsh is the largest, most important wetland in the Pilbara region (DBCA, 2024e) and is listed on the Directory of Important Wetlands of Australia (DBCA, 2018) and on the draft (proposed) RAMSAR list (DBCA, 2017).

The upstream catchment contributions of the Nullagine, Coongan, Shaw and Fortescue rivers are minimal compared to their total catchments (Fortescue, 2025). These catchments are displayed on Figure 10-1.

There are three major watercourses and a number of minor watercourses that drain through the DE. These watercourses include Nullagine River (major watercourse), Bonnie Creek (a tributary of Nullagine River), and Coongan River (major watercourse). A number of ephemeral pools (including Bonnie Pool) are located along Bonnie Creek within the DE. Bonnie Pool appears to be re-charged by surface water and groundwater flows and would be flushed during wet season flows (Stratagen, 2013). Catchment characteristics for the main watercourses within the DE are provided in Table 10-1 below.

Table 10-1: Catchment Characteristics for Main Watercourses within the Development Envelope

Creek System	Total Catchment Area (km^2)	Mainstream Length (km)	Equal Area Slope (m/km)
Nullagine River	7,219	261	1.29
Bonnie Creek	254	32	2.94
Coongan River	7,091	209	1.95

Fortescue (2024) undertook detailed analysis of observed streamflow records at Marble Bar and Nullagine gauging stations, with peak flow estimates based on Flood Frequency Analysis of streamflow records provided in Table 10-2.

Table 10-2: Peak Flow Estimates for Coongan and Nullagine River Catchments

DWER Stream Gauge	Catchment Area to Gauge (km^2)	Peak Flow (m^3/s)					
		50% AEP	20% AEP	10% AEP	5% AEP	2% AEP	1% AEP
Coongan River at Marble Bar (710204)	3,736	508	1,148	1,736	2,463	3,721	4,972
Nullagine River at Nullagine (710004)	873	232	738	1,198	1,698	2,376	2,895

10.1.5.2 Groundwater

The DE is located within the Pilbara groundwater area, proclaimed under the RIWI Act. Groundwater resources in the Pilbara groundwater area are managed though the Pilbara Groundwater Allocation Plan, which covers an area of 200,000 km^2, including Port Hedland and extending inland to Marble Bar, Wittenoom, Nullagine, Tom Price and Newman (WA Government, 2023). The groundwater resources within the Pilbara are a mix of alluvial, sedimentary and fractured rock aquifers (WA Government, 2023).

The DE is located on the northeastern edge of the Hamersley Basin and features Tertiary aged channel iron deposits and detritals which lay non-conformably over Archean basalts and metasediments of the Fortescue Group, known as the Maddina basalts. Underlying the basalts and metasediments are faulted and folded Archean granitoids which form part of the Pilbara Craton.

Two main aquifers have been identified in the DE:

- Superficial formations, including detritals and local calcretes, and

- Fractured and weathered bedrock.

The superficial formations host very localised, seasonal aquifers with low yield potential. Most of the upper creeks are unsaturated. The detritals are characterised by poorly sorted, angular to sub rounded gravel clasts, and calcrete precipitates which are highly weathered. No evidence of karstic features has been observed within the calcretes, or any other indication of enhanced secondary permeability (Fortescue, 2021).

The superficial formations overlie the Fortescue Group basalt bedrock. Increased permeability, secondary porosity and groundwater yields in the basalt are associated with fracture formation and weathered bedrock profiles. Groundwater occurs predominantly in deep fractures, estimated to be 44 to 65 m deep, but to a lesser extent also in shallow weathered and fractured zones from 6 to 18 m depth (Fortescue, 2021).

The two aquifers appear to be hydraulically connected, with no clay or confining layers logged. Groundwater flow is typically from south to north across the site, consistent with topographic flow from recharge to discharge areas. Groundwater levels range from approximately 2 m to 19 m below ground level (mbgl).

The aquifers are likely limited in storage and highly dependent on direct rainfall recharge. Large seasonal variations in groundwater levels are observed, ranging from 2 to 5 m. Groundwater discharge in the area likely occurs via pool systems and in creek lines due to evapotranspiration (Fortescue, 2022).

Regional groundwater quality is generally brackish, with recent measurements from 2023 indicating a salinity range between 680 and 2,640 µS/cm (Fortescue, 2025). However, salinity was recorded as high as 7,980 µS/cm during these measurements (Bore NP16).

Groundwater investigation drilling conducted between September 2009 and February 2010 (MWH, 2010) intersected low yielding fractures (< 1.0 litres per second (L/s)) between 8 m and 27 m depth. Higher yielding fractures (4.0 L/s to 6.0 L/s) were encountered between 26 m and 52 m in depth.

Groundwater Dependant Ecosystems

Groundwater Dependent Ecosystems (GDEs) are those that require access to groundwater on a permanent or intermittent basis to meet their water requirements. The function and composition of these ecosystems is often highly responsive to changes in groundwater availability (Murray *et al.*, 2003). The groundwater regime is a key factor influencing the composition of flora and fauna, ecological processes and ecosystem services associated with GDEs (Hatton and Evans, 1998; Evans and Clifton, 2001).

Flora and vegetation surveys undertaken for the Proposal (ecologia, 2025a) identified potentially ground water dependent vegetation within the DE. Specifically, vegetation units EcAcCs and EvAcCc (discussed further in Chapter 7). There is a total of 4,349.03 ha of potentially groundwater dependent vegetation within the DE.

Persistent surface water occurs in Bonnie Pool which is located 8 km north-east of the former BC Iron's Nullagine Iron Ore Project (MWH, 2010) (Figure 10-1). Bonnie Pool is predominantly fed by surface water flow with only minor alluvial groundwater input occurring directly after surface water flow events (Hydrobiology, 2014).

Water Supply Strategy

Fortescue acquired the BC Iron Nullagine Iron Ore Project in 2016. A total of 17 production bores were constructed to supply water during the mine operations at NIOP (2009-2015) as shown in Figure 10-3, with drilled depths between 34 m and 114 m. The bores targeted fractured rock aquifers within the volcanics and metasediments, with variable yields between about 2 and 10 L/s. It is intended to use several of these existing bores to supply the water requirements for the Proposal.

Fresh to marginal water from groundwater sources will be targeted to meet construction demands for the Proposal. During construction (anticipated to last two years), an estimated water demand of 0.85 GL/yr has been determined. This demand is expected to reduce to less than 0.1 GL/yr in subsequent years for operational purposes.

Fortescue has an existing groundwater extraction licence (GWL171278(7)) that will be sufficient for the supply of water for construction and operation of the Proposal. Under this licence, abstraction of up to 1.01 GL/yr is allowed.

Drawdown associated with abstraction has the potential to impact environmental receptors, including Bonnie Pool. Bonnie Pool is understood to be the nearest surface water pool to the existing NIOP production bores. It lies approximately 1 km north of production bore WW4, whilst all other production bores are at least 4 km further south of Bonnie Pool (Figure 10-3).

The production bore network abstracts groundwater from deeper weathered and fractured rock aquifers, rather than the shallow alluvial aquifers that provide the minor volumes of groundwater to Bonnie Pool. Therefore, abstraction from the existing production bores is unlikely to impact Bonnie Pool.

Further, despite this unlikely impact, abstraction from WW4 is not intended to be undertaken during the Proposal, with abstraction spread across the remaining bores to minimise the potential for the drawdown footprint to extend to Bonnie Pool.

Simple analytical methods (using the Theiss formula) were used to determine the extent of drawdown at recommended flow rates from the next two nearest bores, NP51 and NP55. The analysis shows that if these bores were to be pumped at recommended rates, the lateral extent of drawdown would reach an estimated 800 m and 1,050 m from the centre of the bores respectively. This drawdown extent is well short of the >4 km distance to Bonnie Pool from these bores. Additionally, further studies have found that Bonnie Pool is outside the potential zone of influence for impact associated with groundwater abstraction at the NIOP (Worley Parsons 2014a, 2014b; Hydrobiology, 2014).

Mitigation measures to minimise impacts to Bonnie Pool are outlined in Section 10.1.6.3.

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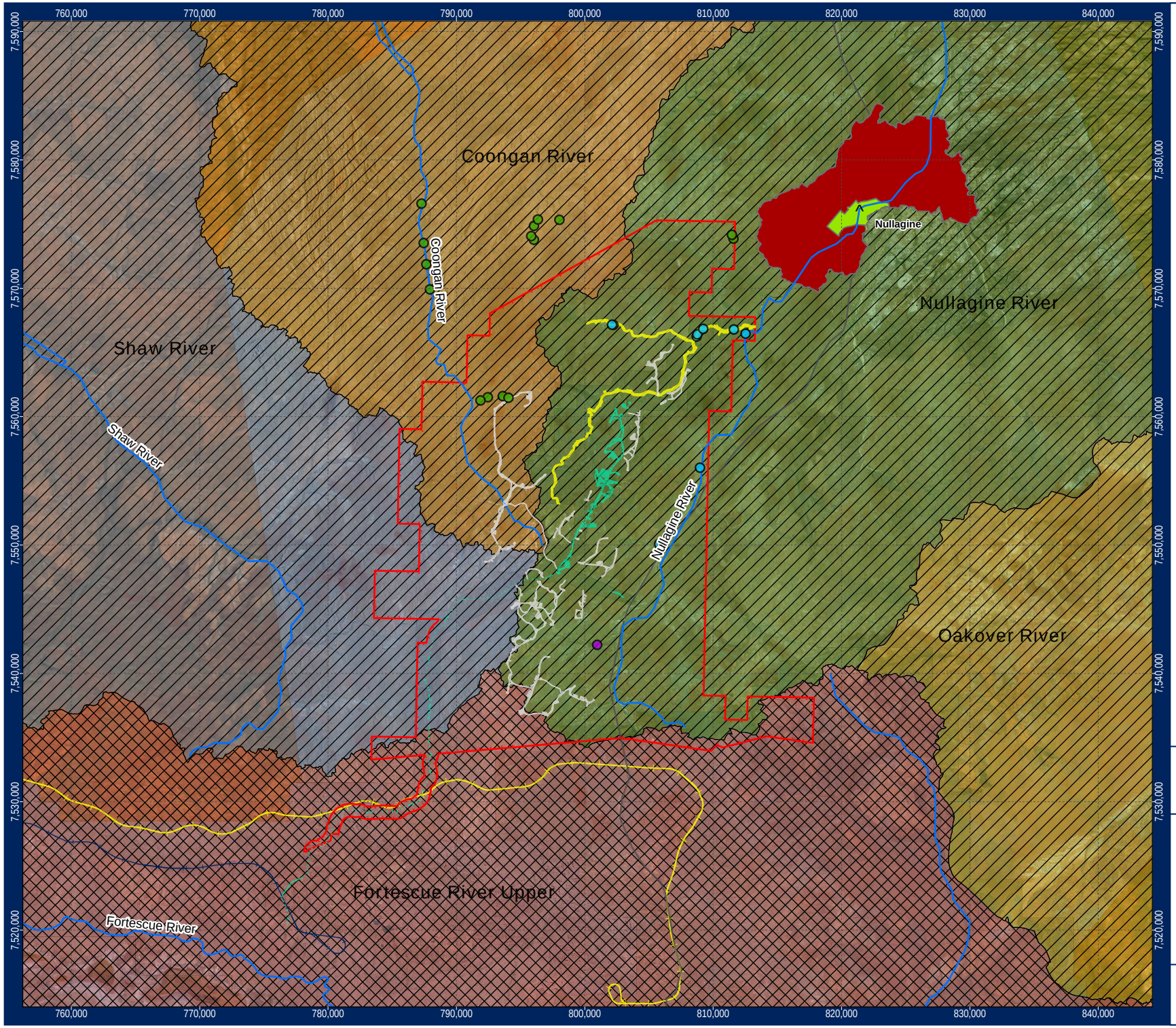

Legend

- Development Envelope
- GOV Towns
- Major Roads
- Fortescue Rail
- Roy Hill Rail
- Indicative Disturbance Footprint
- Approved Disturbance (Nullagine Pilot Wind Farm)

Creek/Drainage lines

- Bonnie Creek
- Drainage Lines

River Basins

- De Grey River
- Fortescue River

Public Drinking Water Source Areas

- Priority 1
- Priority 3

Catchment Area

- Coongan River
- Fortescue River Upper
- Nullagine River
- Oakover River
- Shaw River

Microhabitat Locations

- Artificial pool/waterhole
- Non-permanent pool/ waterhole
- Permanent pool/ waterhole

Data Source(s):
Aerial, Fortescue and ESRI
All other data, Fortescue, 2025

0 2 4 6 8 10
Kilometers

Figure 10-1
Inland Water Features

Requested By: R. Dorji
Drawn By: R. Kerr
Revised By: rykerr
Approved By:
Scale: 1:400,000
Coordinate System: GDA 1994 MGA Zone 50
Project Name: 4519OP002_MP_EN_0093_PartIV_3
Document Name: 4519OP002_MP_EN_0093_034_r1_InlandWater

Date: 2/2/2026
Size: A4L
Revision: 1
Confidentiality: 0

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Fortescue

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Legend

- Development Envelope
- GOV Towns
- Major Roads
- Fortescue Rail
- Roy Hill Rail
- Indicative Disturbance Footprint
- Approved Disturbance (Nullagine Pilot Wind Farm)
- Production Bore Locations

Data Source(s):
Aerial, Fortescue and ESRI
All other data, Fortescue, 2025

N

0 2 4 6 8 10
Kilometers

Figure 10-2
Production Bore Locations
within the Development Envelope

Requested By: R. Dorji — Date: 1/30/2026
Drawn By: R. Kerr — Size: A4L
Revised By: rykerr — Revision: 0
Approved By: — Confidentiality: 0
Scale: 1:300,000
Coordinate System: GDA 1994 MGA Zone 50
Project Name: 4519OP002_MP_EN_0093_PartIV_3
Document Name: 4519OP002_MP_EN_0093_036_r0_ProdBores

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10.1.6 Potential Impacts and Mitigation

10.1.6.1 Potential Impacts

Implementation of the Proposal may have the following impacts on surface waters:

- Changes to the volume of surface water entering watercourses and subsequent impact on downstream values, such as Bonnie Pool and Fortescue Marsh,
- Changes to overland flow paths which may impact on surface water dependent systems, such as banded mulga communities,
- Increased sediment loads in watercourses and potential downstream impacts to sensitive areas from water quality impacts, such as Bonnie Pool and Fortescue Marsh, and
- Changes to flow velocities and flow paths associated with watercourse crossings, increasing potential for scouring and erosion of the bed and banks.

10.1.6.2 Assessment of Potential Impacts

By comparing modelling results of baseline and post development scenarios, areas that may be affected by the Proposal have been identified to assess potential impacts.

The post development assessment undertaken for the wind turbines and associated infrastructure (Fortescue, 2024b) was modelled on a much larger disturbance footprint than the current Proposal (which has subsequently been reduced through implementation of the mitigation hierarchy to avoid environmental values), and therefore reports a substantially worse case in terms of impacts than the Proposal. This study concluded that:

- Areas within the DE with noticeable flow regime changes would be isolated to the turbine access tracks and watercourse crossings. The number of minor and major watercourse crossings have been minimised through project design where possible. The majority of crossings required for the Proposal are minor crossings (with catchment areas less than 5 km^2) and resulting impacts are expected to be minor (Fortescue, 2024b). Any potential impacts would be confined to 200 m upstream and downstream of crossing structures,
- The impacts from major watercourse crossings would be localised and unlikely to impact on regional hydraulic regimes. Decreased flow rates and an increase in ponding of water upstream of the crossing (backwater) may result from flow constrictions or obstructions caused by the culvert structures and road embankment. These impacts are not anticipated to extend more than 400 m upstream. Mitigation measures to reduce this impact are provided in Section 10.1.6.3,
- The main watercourse maximum flood depth and velocity changes are minimal (within +/- 0.02 m and +/-0.02m/s) indicating the Proposal is unlikely to substantially modify the hydrology and morphology of these watercourses both within and downstream of the DE,

- The Proposal would result in minor changes in the total flow volume contributing to the main watercourses (including Coongan River, Shaw River, Nullagine River and Bonnie Creek). These changes are marginal (< 1%) due to the IDF being small in size compared to the associated catchments and the location of the DE in the upper catchment,

- The post development assessment also reported that the effects of the Bonnie Creek crossing in low flow conditions (i.e., flows for events smaller than 10% AEP) are negligible. For any potential larger events, the impacts are still anticipated to be local and unlikely to extend more than 300 m downstream and are unlikely to impact regional flow conditions, including water quality and volumes into Bonnie Pool (which is located approximately 7 km downstream of the crossing), and

- The changes to flow velocities in the vicinity of the watercourse crossings may impact existing geomorphological conditions of creek systems. Reduced flow rates at watercourse crossings may result in a higher rate of sediment deposition upstream of the road embankment while introducing artificial constriction and obstruction (such as culverts embankments) may change flow paths in the immediate vicinity, resulting in localised erosion/scour.

In relation to potential downstream impacts to the sensitive receptor, Fortescue Marsh, it should be noted that the turbines and associated infrastructure are located approximately 29 km from the Fortescue Marsh and Christmas Creek mine is located between the DE and the Fortescue Marsh. The mine has existing surface water (i.e., stormwater) management practices and infrastructure in place to minimise the risk of low-quality water entering this sensitive receptor. Therefore, no impacts to the Fortescue Marsh are anticipated from the Proposal.

The Proposal activities (i.e., earthworks, transportation of pollutants, treated wastewater, re-fuelling and spills/leaks) may impact surface water quality, potentially leading to poor water quality, particularly in relation to stormwater runoff from the IDF. The potential for large sediments loads to enter watercourses is considered low due to the mitigation measures proposed. Furthermore, impacts from contamination (i.e., spills) will be avoided and minimised through the mitigation measures outlined below and therefore result in negligible impacts. Therefore, it is unlikely that Proposal activities such as minor earthworks will result in significant impacts.

Overall, the Proposal design and layout are anticipated to have very low impacts on the existing surface water flow regime and water quality within the DE and downstream.

10.1.6.3 Proposed Mitigation Measures

To reduce potential impacts, the following mitigation is proposed:

- A construction surface water and sediment management plan will be developed and implemented to manage flood risk and minimise soil erosion and the potential for the transport of sediment to downstream waters during the construction phase,

- Where possible, construction activities will be avoided during the periods of heavy rainfall to avoid erosion/scour, damage to the soil and to minimise risk of water quality degradation in the downstream systems,

- Erosion control measures will be installed at the inlet and outlet of the culvert structures to minimise the risk of bed and bank erosion and local scour, and to prevent undermining of the structures,

- The floodway batters and driving surface will be armoured to minimise erosion and sedimentation downstream, and

- Clearing of riparian vegetation will be avoided and minimised were possible

The design of the turbine access track aims to minimise crossing of watercourses. Where this is unavoidable due to the need to access turbines, the following design principles are implemented to minimise impacts:

- Track alignment and crossing design to utilise existing cleared tracks where possible,

- Each watercourse is crossed only once within the DE to avoid accumulated impacts,

- Crossing of major watercourses (named rivers/creeks) is minimised where possible,

- Watercourse crossings to be positioned perpendicular to the flow direction to reduce the effects of streamflow energy on the structure as well as impacts resulting from the redirection of flows against channel banks, such as scouring and erosion,

- Crossing design to maintain flow continuity and minimise impacts to volume and flow rates of watercourses, and

- Crossing to be designed to minimise disturbance required in watercourses.

Potential bed and bank erosion and local scour caused by construction of watercourse crossings will be managed through a permit to interfere with the bed or banks of a watercourse under the RIWI Act (Bed and Banks Permit). Conditions and requirements of the permit are expected to include requirements for erosion control, vegetation management, rehabilitation and maintaining natural water flow in order to minimise potential impacts to watercourses as far as practical.

To ensure negligible impact to Bonnie Pool during project construction and operation, Fortescue will:

- Limit overall abstraction to below the GWL limit of 1.01 GL/yr,

- Avoid use of production bore WW4 during project construction or operation,

- Spread abstraction requirements across the borefield and away from Bonnie Pool where possible,

- Ensure bores are pumped at or below recommended rates, and

- Abide by the conditions of GWL171278(7) and the accompany GOS, which includes monitoring commitments and trigger levels to ensure impacts to receptors (including Bonnie Pool) are negligible and/or manageable.

10.1.7 Residual Impact and Predicted Outcome

No significant impacts are anticipated as a result of construction or operation of the Proposal with regard to inland waters. The turbines and associated hardstand areas/supporting infrastructure have been designed outside of the 1% AEP floodplain area. Modelling assessment undertaken for the Proposal reported negligible downstream impacts on the sensitive receptor Bonnie Pool (Fortescue, 2025; Fortescue, 2024b), and negligible impacts anticipated to the Fortescue Marsh.

Mitigation of potential impacts to inland waters are also addressed through regulation by other Decision-Making Authorities through permitting and licensing requirements (i.e. 26D and 5C licenses and Permits to Interfere with Bed and Banks under the RIWI Act). The Bed and Banks permit(s) required for construction of the watercourse crossings are expected to include conditions that will effectively mitigate potential impacts, such as destabilisation of watercourse banks during construction and subsequent increased erosion risk.

Construction and operational water requirements will be supplied from the existing borefield, approved under GWL171278(7). No changes to the abstraction volume permitted under this licence are required.

10.2 Terrestrial Environmental Quality

10.2.1 EPA Objective

The WA EPA objective for the terrestrial environmental quality environmental factor is '*to maintain the quality of land and soils so that environmental values are protected*' (EPA, 2016f).

Terrestrial Environmental Quality is defined as '*the chemical, physical, biological and aesthetic characteristics of soils. Soils are the layer of organic and inorganic weathered material that accumulates at the Earth's surface*' (EPA, 2016f).

10.2.2 Policy and Guidance

The following policy and guidance have been considered in this section:

- Statement of Environmental Principles, Factors and Objectives (EPA, 2023b),
- Environmental Factor Guideline – Terrestrial Environmental Quality (EPA, 2016f),
- Identification and Investigation of Acid Sulfate Soils and Acidic Landscapes (DER, 2015a), and
- Treatment and Management of Soil and Water in Acid Sulfate Soil Landscapes (DER, 2015b).

10.2.3 Studies and Surveys

No specific studies or surveys have been completed for the Proposal in relation to Terrestrial Environmental Quality. A desktop review was therefore undertaken using the following information sources:

- Acid Sulfate Soil Risk Map (DWER, 2017),

- Atlas of Australian ASS (Fitzpatrick *et al*., 2011),
- Contaminated Sites Database (DWER, 2020),
- Soil Landscape Mapping – Systems (DPIRD, 2022), and
- Technical Bulletin No. 92 An inventory and condition survey of the Pilbara region (Van Vreeswyk *et al*., 2004).

10.2.4 Receiving Environment

Notable considerations regarding Terrestrial Environmental Quality for the Proposal include Acid Sulfate Soils (ASS), land erosion and contaminated sites. According to the ASS Risk Map (DWER, 2017), there is no risk of ASS within the DE. The Atlas of Australian ASS show that the vast majority of the DE (87.05%) is described as having an extremely low probability for occurrence of ASS. However, a recent desktop soil and landform assessment (Landloch, 2025) reported a high chance of ASS occurring in areas associated with Bonnie Creek and the Nullagine River (see Section 10.3.3 for further detail on this assessment).

According to the Contaminated Sites Database (DWER, 2020), no contaminated sites have been recorded within the DE. The closest contaminated site is located 100 km south of the DE in Newman. However, the Nullagine Iron Ore Mine does overlap the northern section of the IDF. This mine has not been formally closed and therefore is not included within the Contaminated Sites Database. The Nullagine Iron Ore Mine is owned and operated by Fortescue and deposits channel ore type (pea gravel) forming numerous steep sided mesas in the area. The Proposal was designed to avoid areas of the mine that are high risk of contamination (i.e., fuel storage, explosives and landfill sites). Testing has not indicated the presence Potentially Acid Forming within the mine site.

There are 12 land systems within the DE (DPIRD, 2022), the majority of which (see Section 3.3.1.2 for full list) are not highly susceptible to erosion (Van Vreeswyk *et al*., 2004). This is due to their specific soil and landscape characteristics, which help to protect the soil from erosion. However, disturbance to the River Land System may initiate erosion (Van Vreeswyk *et al*., 2004). This land system covers 0.56% of the DE and is largely stabilised by Buffel grass and Spinifex, and accelerated erosion is uncommon; however, susceptibility to erosion is high or very high if vegetative cover is removed.

The vegetation types mapped by ecologia (2025a) within the DE (see Chapter 7) do not correlate with the above units and therefore, these units are unlikely to be present within the DE.

10.2.5 Potential Impacts and Mitigation

Potential impacts from construction of the Proposal may result in a number of potential impacts including disturbance of ASS (particularly in areas associated with Bonnie Creek and the Nullagine River), land erosion and contamination of soil resulting in a decline in Terrestrial Environmental Quality. Given the limited potential for historic contamination throughout the DE, and that the majority of the land systems of the DE are not highly susceptible to erosion, potential impacts to Terrestrial Environmental Quality can be mitigated through standard environmental management actions.

As detailed in Section 10.1.5.1, with regard to construction of creek crossings, the minor changes in maximum flow velocities are not expected to alter the erosional and depositional regime of the creek systems. The following activities will be undertaken to mitigate the risk of disturbing ASS, exacerbating erosion or contamination of soils:

- Investigatory studies will be undertaken prior to ground disturbance works within the areas at high risk of ASS to verify the presence of ASS within the DE. These studies will be undertaken in accordance with 'Identification and investigation of acid sulfate soils and acidic landscapes' (DWER, 2015),
- Should investigatory studies identify ASS and/or should construction work result in the disturbance of ASS, these ASS will be treated and/or managed in accordance with 'Treatment and management of soil and water in acid sulfate soil landscapes' (DWER, 2015),
- All soils potentially contaminated from spills or leaks will be remediated on site where practical, in line with Fortescue's spill response procedure. Where the volume or type of contamination requires excavation and disposal of contaminated soils, disposal shall be undertaken by an appropriately licenced contractor,
- Hazardous materials used during construction will be stored in compliance with relevant Australian Standards and Regulations,
- On-site refuelling of machinery and plant will occur on sealed or bunded areas and at least 50 m from all drainage lines or water bodies. Drip trays will be used in remote areas where a formalised refuelling area is not feasible,
- Provision of spill response kits at refuelling locations and other areas with a risk of hydrocarbon or chemical spills occurring, and appropriate spill response training for site personnel with incident recording procedures in place throughout construction and operation,
- Cleared vegetation will be stockpiled onsite for use post works completion to encourage soil stability and revegetation. Where possible direct return of topsoil material will be undertaken,
- Establishment of designated access roads and demarcated clearing areas to prevent unauthorised disturbance,
- Erosion and sediment control measures will be applied to prevent erosion of exposed areas and sediment discharge to adjacent areas and topsoil stockpiles, where practicable,
- Laydown areas will be rehabilitated or otherwise stabilised as early as practicable to minimise the potential for erosion, and
- Armouring the floodway batters and driving surface to minimise erosion and scour as water flows over the road.

10.2.6 Residual Impact and Predicted Outcome

With the implementation of mitigation measures listed above, no significant residual impacts to Terrestrial Environmental Quality are anticipated and the EPA's objective for the Terrestrial Environmental Quality factor '*to maintain the quality of land and soils so that environmental values are protected'* can be met.

10.3 Landforms

10.3.1 EPA Objective

The WA EPA's objective for the Landforms environmental factor is '*to maintain the variety and integrity of significant physical landforms so that environmental values are protected*' (EPA, 2018b).

Landforms are defined as, '*the distinctive, recognisable physical features of the earth's surface having a characteristic shape produced by natural processes. A landform is defined by the combination of its geology (composition) and morphology (form)*" (EPA, 2018b).

10.3.2 Policy and Guidance

The relevant policy and guidance for Landforms is:

- Environmental Factor Guideline – Landforms (EPA, 2018b), and
- Statement of Environmental Principles, Factors and Objectives (EPA, 2023b).

The EPA (2018b) defines criteria for determining whether a landform is significant, as shown in Table 10-3.

Table 10-3: Criteria for Determining Whether a Landform is Significant (EPA, 2018b)

Criteria	Determination
Variety	The landform is a particularly good or important example of its type. The landform is not well represented over the local, regional or national scale or differs from other examples at these scales, either naturally or as a result of cumulative impacts from existing and reasonably foreseeable activities, developments and land uses.
Integrity	The landform is intact, being largely complete or whole and in good condition.
Ecological importance	The landform has a distinctive or exclusive role in maintaining the existing ecological and physical processes; for example, by providing a unique microclimate, source of water flow, or shade. The landform supports endemic or highly restrictive plants or animals.
Scientific importance	The landform provides evidence of past ecological processes or is an important geomorphological or geological site. The landform is of recognised scientific interest as a reference site, or an example of where important natural processes are operating.
Rarity	The landform is rare or relatively rare, being one of the few of its type at a national, regional or local level.
Social importance	The landform supports significant amenity, cultural or heritage values linked to its defining physical features.

10.3.3 Studies and Surveys

Fortescue engaged Landloch Pty Ltd (Landloch) to complete a desktop soil and landform assessment for the Proposal (Landloch, 2025). This assessment characterised landforms within an approximately 96,445 ha survey area (herein referred to as the 'Landforms Survey Area'), which encompasses the entire extent of the DE. The desktop assessment aimed to identify any landforms of potential significance and involved:

- Review of relevant site information, land systems, and regional soil information,
- Desktop analysis of the landforms present within the DE and assessment of their potential significance,
- Desktop analysis of the soils present within the DE and an assessment of the potential impact from the Proposal,
- Preliminary mapping of soils and landforms based on desktop information, and
- Assessment of potential ASS.

The desktop soil and landform assessment has been used to inform the potentially significant landforms within the DE and is provided in Appendix T.

10.3.4 Receiving Environment

10.3.4.1 Bioregions

The DE is situated in the Pilbara Bioregion, which is made up of four subregions (Chichester, Fortescue Plains, Hamersley and Roebourne). The DE stretches across two subregions, Chichester and Fortescue Plains, however it is predominantly located within the Chichester subregion. The Chichester subregion is characterised by undulating Archean granite and basalt plains (Kendrick and Mckenzie, 2001b). The Fortescue Plains subregion is alluvial with river frontages, extensive saltmarsh, mulga-bunch grass and short-grass communities (Kendrick and Mckenzie, 2001a). In the broader context of the soils and landscapes locally and within the Pilbara landscape regionally the characteristics of the Chichester and Fortescue subregions are well represented.

10.3.4.2 Landforms

The Landloch (2025) desktop assessment provides a review of the following within the Landforms Survey Area (Appendix T):

- Land resources mapping,
- Atlas of Australian soils, including ASS
- Nullagine Iron Ore Project Soils Report,
- Topography and relief,
- Vegetation communities,
- Terrestrial vertebrate fauna, and
- Cultural Heritage areas.

Based on assessment of land systems mapping, elevation, slope, vegetation mapping, and fauna habitat mapping, Landloch (2025) identified seven landform units within the DE.

A description of the landform units within the DE is provided in Table 10-4 and shown in Figure 10-3.

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Table 10-4: Landforms within the Development Envelope (Landloch, 2025)

Landform unit	Description	Associated landforms	Main associated vegetation types (as per Chapter 7)	Associated habitat type (as per Chapter 8)	Extent within DE (ha)	Extent within IDF (ha)
Stony plains	Stony plains occur across various elevations and between other landform units. A significant vegetation type VfAl (associated with the four plant assemblages of the Wona Land System PEC (Priority 1, Priority 3)) occurs in this landform unit however only in small areas and is not considered to be significant. Stony plains provide supporting habitat for various significant fauna species within the DE. A number of ethnographic and archaeological heritage sites occur across the stony plains. This landform unit is not considered to be unique to the DE, as it is present throughout the Pilbara. Therefore, the stony plains landform unit is unlikely to be a significant landform.	Stony plains and interfluves, stony plains and slopes, gravelly plains, stony upper plains and rises, hardpan plains, gravelly hardpan plains, saline stony plains.	AaCpTw, AaEp, AaTe, AiCpTe1, AiCpTe2, AiSgTb, ElAbTl	Plain (stony/gibber)	56,405.46	665.69
Upper erosional surfaces	The upper erosional surfaces comprise plateaux, mesas, upper slopes and breakaways. The landform unit is found throughout the DE. The mesas within the upper erosional surfaces landform unit are a potentially significant landform as they provide potential fauna habitat. Banded Iron Formations (BIFs) within the upper erosional surfaces landform unit are a potentially significant landform as they have environmental and economic values, supporting unique ecosystems. The presence of caves within the gorges and gullies of the upper erosional surfaces landform unit are a potentially significant landform as they provide potential habitat for significant fauna.	Hills, ridges, plateaux, mesas, breakaways, buttes, mountains and hills.	AiCpTe1, AiCpTe2, AiSgTb, ElGwTe	Hills/ranges/plateaux, rocky escarpments, gorges/gullies	5,287.50	46.79

Landform unit	Description	Associated landforms	Main associated vegetation types (as per Chapter 7)	Associated habitat type (as per Chapter 8)	Extent within DE (ha)	Extent within IDF (ha)
	A number of landforms within the landform unit are considered to be culturally significant. This may potentially include a number of caves occurring within gorges, gullies and ridges. There is potential for such features to occur where erosional landform elements interact with drainage lines and floors. The upper erosional surfaces landform unit is potentially a significant landform.					
Gilgai plains	Gilgai plains are associated with self-mulching cracking clay soils and occur in close proximity to the stony plains, and hills and rises landform units. A significant vegetation type VfAl (associated with the four plant assemblages of the Wona Land System PEC (Priority 1, Priority 3)) is associated with the gilgai plains. One of the central gilgai plains is associated with a large cultural heritage area. The association with the VfAl vegetation type and relative low abundance of gilgai plains throughout the Pilbara suggests that this landform unit is potentially significant.	Gilgai plains, stony gilgai plains, Stony gilgai upland plains.	AaEp, AaTe, AaTs, VfAl	Plain (cracking clay), woodland (closed), woodland (open)	6,462.76	98.14
Hills and rises	Hills and rises occur throughout the DE, typically above the stony plains and gilgai plains. As erosional landforms, the hills and rises may provide some scientifically significant insight into past geological processes. This landform unit is not considered to be unique to the DE, as it is present throughout the Pilbara. Therefore, the hills and rises landform unit is unlikely to be a significant landform.	Hills, low rises, low basalt hills, low rises.	AeTe, AiCpTe1, AiCpTe2, AiSgTb, AmTe, ElAbTl, ElGwTe	Granite outcrops	11,749.32	97.06

Landform unit	Description	Associated landforms	Main associated vegetation types (as per Chapter 7)	Associated habitat type (as per Chapter 8)	Extent within DE (ha)	Extent within IDF (ha)
Lower slopes	Lower slopes occur throughout the DE and are found down from the upper slopes of the upper erosional surfaces' landform units. The lower slopes are also associated with the hills and rises, stony plains, and drainage lines and floors landform units. A small number of archaeological and ethnographical cultural sites occur within this landform unit. The lower slopes landform unit is unlikely to be a significant landform.	Lower slopes, lower footslopes, mesa footslopes and dissected slopes.	AmTe, ElGwTe	N/A	4,968.16	32.15
Drainage lines and floors	A number of major drainage channels occur throughout the DE, the largest of which is the Nullagine River found in the eastern region of the DE. The Nullagine River is the only drainage lines and floors unit within the DE which is also associated with the floodplains and terraces landform unit. Typically, the drainage lines and floors are associated with the stony plains landform unit. In the north of the DE this landform unit is associated with the upper erosional surfaces landform unit. The drainage lines and floors have cultural significance and are therefore a potentially significant landform. The drainage lines and floors are considered rare, and Nullagine River and Bonnie Creek are potentially significant within the regional setting. The drainage lines and floors landform unit is potentially a significant landform.	Upper drainage lines, drainage lines, drainage floors and channels, minor and major channels, narrow drainage floors and channels, sluggish drainage tracts, channelled drainage tracts, drainage foci. Groves, groves and drainage foci.	AcTe, AmTe, EcAcCs, ElAbTl, EvAcCc	Drainage line/river/creek (minor), drainage line/river/creek (major), gorges/gullies	3,804.06	4.24
Floodplains and terraces	Within the DE, floodplains and terraces occur exclusively in association with the Nullagine River, a specific landform within the drainage lines and floors unit. As these landforms are depositional there is little evidence of past ecological processes.	Sandy levees and sand sheets, upper and lower terraces, floodplains.	AmTe	N/A	1,296.58	0.00

Landform unit	Description	Associated landforms	Main associated vegetation types (as per Chapter 7)	Associated habitat type (as per Chapter 8)	Extent within DE (ha)	Extent within IDF (ha)
	The floodplains and terraces landform unit is unlikely to be a significant landform.					

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Legend

- Development Envelope
- GOV Towns
- Major Roads
- Fortescue Rail
- Roy Hill Rail
- Indicative Disturbance Footprint
- Approved Disturbance (Nullagine Pilot Wind Farm)

Landform Units

- Drainage lines and floors
- Erosional landform unit
- Floodplains and terraces
- Gilgai plains
- Hills and rises
- Lower slopes
- Stony Plains

Data Source(s):
Aerial, Fortescue and ESRI
All other data, Fortescue, 2025

N

0 2 4 6 8 10
Kilometers

Figure 10-3
Landforms
within the Development Envelope

Requested By: R. Dorji
Drawn By: R. Kerr
Revised By: rykerr
Approved By:
Scale: 1:300,000
Coordinate System: GDA 1994 MGA Zone 50
Project Name: 4519OP002_MP_EN_0093_PartIV_3
Document Name: 4519OP002_MP_EN_0093_037_r0_Landforms

Date: 1/30/2026
Size: A4L
Revision: 0
Confidentiality: 0

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10.3.4.3 Significant Landforms

Significant landforms are those which have distinctive geology and morphology. As described in Table 10-3, the significance of landforms is assessed in terms of variety, integrity, ecological importance, scientific value, rarity and social importance (EPA, 2018b). Landloch (2025) assessed which of the landform units within the DE are considered potentially significant as per the EPA guidelines (EPA, 2018b). The landform units that contain landforms that are considered potentially significant are:

- Upper erosional surfaces,
- Gilgai plains, and
- Drainage lines and floors.

An assessment of the significance of these landform units against the EPA (2018b) criteria is provided below and in Table 10-5. The Fortescue Marsh (located 9.3 km south of the DE) is also considered an important landform and is assessed below.

The remainder of the landform units in Table 10-4 are not considered to be significant and their assessment of significance is provided in Appendix T.

Upper erosional surfaces

The mesas within the upper erosional surfaces landform unit within the DE are a potentially significant landform (Landloch, 2025). Mesas are common in the Pilbara region and within the DE. They provide important environmental values, including habitat for subterranean fauna and SREs. SREs typically have limited dispersal capabilities resulting in small populations which are isolated from each other by geographic features, with prolonged isolation resulting in speciation between populations (Harvey *et al.,* 2011). Fauna habitats are discussed further in Chapter 8. Mesas are associated with various geological types and holds significant mineral resource value (EPA, 2018b). The DE intersects mesas over a cumulative total of 1,372.18 ha which represents 1.53% of the total area of the DE.

The mesas and plateaux of the upper erosional surface landform unit have an association with BIFs which are a potentially significant landform (Landloch, 2025). BIFs are ancient rock formations, characteristic of the Pilbara region, with environmental and economic value (Gibson *et.al.,* 2007). BIFs are composed of iron-rich minerals and silica and are crucial in supporting unique ecosystems such as habitats for subterranean fauna and specialised vegetation.

Additionally, gorges and gullies occur within this landform unit, which have ecological and cultural significance as they provide habitats for significant fauna (as described in Chapter 8) (Landloch, 2025). The presence of caves occurs at breakaways and gorges and gullies. Caves and cave systems are ecologically significant features in the Pilbara region (Landloch, 2025). Mesas and BIFs commonly host caves, cave systems and overhangs, and provide habitat for species including the PLNB. However, targeted surveys have not identified any suitable roost caves for this species within the DE. Habitat considerations for the PLNB are further discussed in Chapter 8. Both caves, and gorges and gullies occur throughout the Pilbara and are not regionally unique to the DE (Landloch, 2025).

Rocky escarpments occur within the upper erosional surface landform unit, and provide habitat for the following significant species:

- Northern Quoll (Critical Habitat),
- Pilbara Olive Python (Critical Habitat),
- Peregrine Falcon (Critical Habitat),
- PLNB (Critical Habitat),
- Ghost Bat (Critical Habitat),
- Grey Falcon (Supporting Habitat),
- Western Pebble Mound Mouse (Supporting Habitat),
- Long-tailed Dunnart (Supporting Habitat), and
- Oriental Plover (Supporting Habitat).

Refer to Chapter 8 for further information on these species.

As shown in Table 10-5, upper erosional surfaces are potentially significant due to their ecological, scientific and social importance (Landloch, 2025).

Gilgai plains

The gilgai plains of the DE are potentially significant due to their association with vegetation type VfAl (associated with the four plant assemblages of the Wona Land System PEC (Priority 1, Priority 3)) (Landloch, 2025). See Chapter 7 for further information on this PEC. One of the central gilgai plains is associated with a large ethnographic cultural heritage area, though no consistent relationship between the gilgai plains and cultural heritage exists (Landloch, 2025). The gilgai plains are uncommon within the regional setting, occurring across approximately 7.18% of the DE. As shown in Table 10-5, the gilgai plains landform unit is potentially significant due to ecological importance and rarity.

Drainage lines and floors

Significant landforms may occur in the drainage lines and floors landform unit. A number of major drainage channels occur throughout the DE, the largest of which is the Nullagine River found in the eastern region of the DE. Major drainage channels within the DE such as the Nullagine River and Bonnie Creek occur sparingly across the Pilbara and are potentially significant within the regional setting (Landloch, 2025). Creeks and rivers form an integral part of the drainage lines and floors landform unit. Many ethnographic heritage sites identified within the DE are closely associated with waterways, reflecting their cultural importance (Landloch, 2025).

As shown in Table 10-5, the drainage lines and floors landform unit is considered potentially significant due ecological and social importance.

Fortescue Marsh

Fortescue Marsh is a Priority 1 PEC which is located approximately 9.3 km south of the DE and is recognised as a nationally important wetland due to its high conservation, cultural and heritage values (DBCA, 2024e). Refer to Section 10.1 and Chapter 7 - Flora and Vegetation for further information on the Fortescue Marsh. It should be noted that the turbines and associated infrastructure are located approximately 29 km from the Fortescue Marsh and Christmas Creek mine is located between the DE and the Fortescue Marsh. No impacts associated with the Fortescue Marsh are anticipated from the Proposal.

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Assessment of Landform Significance

The assessment of landform significance against the EPA (2018b) criteria is provided in Table 10-5. The remainder of the land units in the DE (as described in Table 10-4) are not considered to be significant and their assessment of significance is provided in Appendix T.

Table 10-5: Assessment of Landform Significance (Landloch, 2025)

Landform unit	Criteria for determining whether a landform is significant (EPA, 2018b)						Significance
	Variety	Integrity	Ecological importance	Scientific importance	Rarity	Social importance	
Upper erosional surfaces	The erosional landforms are typically well represented locally and regionally. This landform unit covers 5,287.50 ha of the DE.	The upper erosional surfaces are typically intact and in varied condition at the local level. Disturbance is associated with the Nullagine Iron Ore mine. The northern landforms are undisturbed.	Provides critical habitat a number of significant fauna species.	Erosional landforms may provide insight into past geological processes.	Present across multiple land systems within the Pilbara. Individual landforms such as caves and gorges have potential to be rare.	Various sites of cultural significance associated with this landform unit.	Potentially significant
Gilgai plains	The gilgai plains are typically well represented locally and regionally. This landform unit covers 6,462.76 ha of the DE.	The gilgai plains are intact and in good condition at the local level.	The gilgai plains is associated with VfAl, which is associated with the four plant assemblages of the Wona Land System PEC (Priority 1, Priority 3).	Predominantly depositional landform, as such there is little evidence of past ecological processes.	Uncommon within the regional setting. Occurring across approximately 7.18% of the DE.	One of the central gilgai plains occurs within a single large ethnographic cultural heritage area, though no consistent relationship between the gilgai plains and	Potentially significant

Landform unit	Criteria for determining whether a landform is significant (EPA, 2018b)						Significance
	Variety	Integrity	Ecological importance	Scientific importance	Rarity	Social importance	
						cultural heritage exists.	
Drainage lines and floors	The drainage line and floors are typically well represented locally and regionally. This landform unit covers 3,804.06 ha of the DE.	The drainage lines and floors are intact and in good condition at the local level.	Major channels likely to be significant watercourses for the region.	Depositional landform, as such there is little evidence of past ecological processes.	Minor lines and floors occur extensively within the Pilbara. Major channels are less common.	Drainage lines are considered culturally sensitive.	Potentially significant

10.3.5 Potential Impacts and Mitigation

Impacts to potentially significant landforms from implementation of the Proposal will primarily occur as a result of clearing of vegetation and construction. Implementation of the Proposal may result in the following impacts:

- Clearing of up to 46.79 ha associated with the upper erosional surfaces landform unit within the IDF, which accounts for 0.88% of the landform unit identified within the DE,
- Clearing of up to 98.14 ha associated with the gilgai plains landform unit within the IDF, which accounts for 1.52% of the landform unit identified within the DE,
- Clearing of up to 4.24 ha associated with the drainage lines and floors landform unit within the IDF, which accounts for 0.11% of the landform unit identified within the DE,
- The Proposal will result in visual changes to the landscape due to landform clearing and associated construction activities. Visual Impact Assessments have been conducted, with findings discussed in Chapter 9, and
- There is potential to impact the cultural heritage values associated with the mesas and BIFs within the upper erosional surfaces landform unit. Cultural heritage considerations, particularly those associated with clearing of mesas, are further addressed in Chapter 9.

Mitigation measures were considered during the Proposal's design process to avoid and minimise impacts to significant landforms where possible, including:

- All turbine pads have been specifically located to avoid mesas and significant drainage lines, ensuring that the Proposal does not impact the physical integrity or visual landscape of these landforms, and
- Fortescue is committed to minimising impacts on Heritage Places in all of its project areas which includes avoidance of impacts on Heritage Places wherever possible.

Where avoidance is not possible, the following measures will be implemented to mitigate and minimise impacts:

- All clearing areas will be marked and/or GPS recorded according to Fortescue's internal Land Use Certificate system clearing process prior to clearing, then checked and confirmed post-clearing through inspection of aerial imagery of clearing areas and comparison to the IDF,
- Rehabilitation efforts will focus on restoring flora and vegetation values of the landform units. Rehabilitation of temporary clearing is further discussed in Chapter 7, and
- Clearing of SRE habitat will be avoided where possible and otherwise minimised including within the upper erosional surfaces landform unit. Any potential impacts to SREs are discussed further in Chapter 8.

10.3.6 Residual Impact and Predicted Outcome

No significant impacts are anticipated as a result of construction or operation of the Proposal with regard to landforms. The Fortescue Marsh is sufficiently distant from the Proposal (approximately 29km from the Proposal infrastructure) that impacts to this important landform are unlikely.

All turbine pads have been located to avoid impacting mesas and significant drainage lines. Ecological values associated with mesas and BIFs such as flora and vegetation and SRE species are not anticipated to be significantly impacted due to the limited extent of these landforms within the IDF.

With the implementation of mitigation measures listed above, no significant residual impacts to Landforms are anticipated and the EPA's objective for the Landforms factor ''*to maintain the variety and integrity of significant physical landforms so that environmental values are protected*" (EPA, 2018b) can be met.

11 HOLISTIC IMPACT ASSESSMENT

The EIA process needs to consider the benefits and impacts of the Proposal in a holistic manner. As noted in the EPA's guidance, where the combination of environmental effects of two or more environmental factors has the potential to result in a significant impact, a holistic impact assessment should consider how these factors interact through the application of the EPA's objectives for environmental factors.

The Proposal's predicted impacts have been considered independently against each of the EPA's environmental factors and in relation to the EPA's environmental principles in previous sections of this ERD. Fortescue recognises there are complex linkages between Flora and Vegetation, Terrestrial Fauna, Social Surroundings, Inland Waters, Terrestrial Environmental Quality, and Landforms. These connections are illustrated in Plate 11-1. A holistic impact assessment has been undertaken in this chapter to determine if these interactions could result in a significant impact.

11.1 Assessment Approach

The following process has been implemented to determine and assess the holistic impacts of the Proposal:

1. Identify connections and interactions between environmental factors (Plate 11-1),
2. Identification of holistic impacts:
    a) Where a potential impact(s) has been completely avoided, it will not contribute to holistic impacts,

    b) Where a predicted impact is considered likely to affect only one factor it is unlikely to contribute to holistic impacts and additional mitigation measures are not required,

    c) Where an activity has been considered to likely result in a significant impact across two or more factors, and the mitigation hierarchy has been applied in isolation per factor, consideration will be given if further measures are required to mitigate this combined impact,

    d) Where there are multiple overlapping minor impacts, or a minor impact affects multiple values and has been assessed as insignificant in the context of an individual factor, these may require further holistic consideration, and

    e) The environmental principles of intergenerational equity, and conservation of biological diversity and ecological integrity are considered the most relevant and have been a foundation when considering potential significance of the holistic impact of the Proposal.

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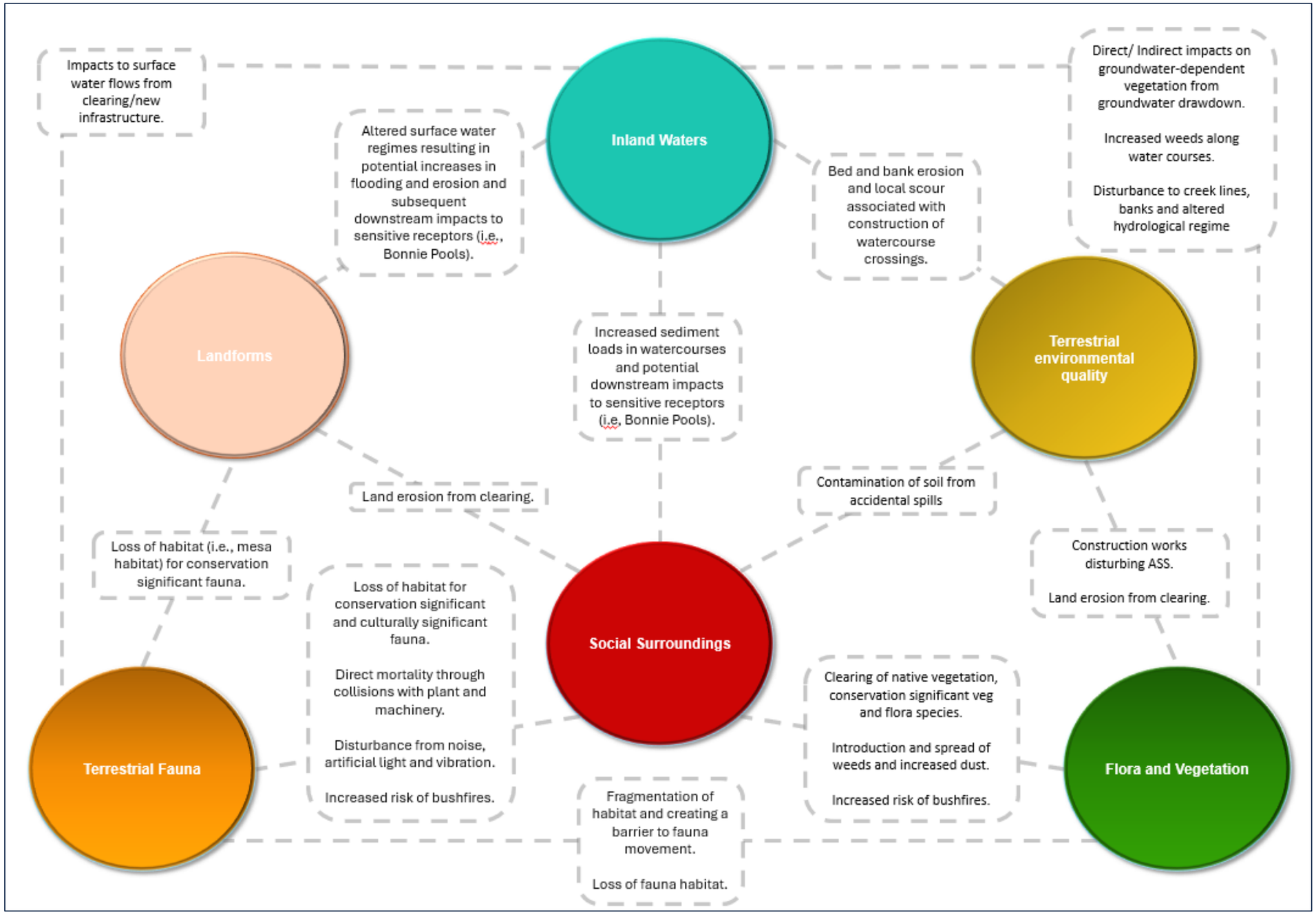

Plate 11-1: Intrinsic Interactions Between Environmental Factors

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11.2 Consideration of Holistic Impacts

By understanding the intricate connections between environmental factors identified in Plate 11-1, we can assess how changes in one aspect of the environment cascade through others, creating combined and sometimes compounding impacts on the same receptors.

The key Proposal activities likely to result in impacts across multiple environmental factors and combined impacts to environmental receptors are:

- Vegetation and land clearing,
- General Construction and Maintenance Activities, and
- Works Affecting Watercourses and Groundwater Abstraction.

These are discussed in further detail in Section 11.2.1 to 11.2.3. Table 11-1 summarises the relevant holistic impacts associated with construction and operation of the Proposal.

11.2.1 Vegetation and Land Clearing

The Proposal will require permanent clearing of 427.5 ha of 'Good to Excellent' condition native vegetation. The combined impacts associated with vegetation clearing include:

- Loss of Priority flora and supporting habitat (Flora and Vegetation),
- Loss of culturally significant flora (Flora and Vegetation, and Social Surroundings),
- Loss of habitat (including mesa habitat) and habitat fragmentation for conservation significant and culturally significant fauna species (Terrestrial Fauna, Landforms and Social Surroundings),
- Direct fauna mortality through collisions with plant and machinery (Terrestrial Fauna and Social Surroundings),
- Altered surface water regimes resulting in potential increases in flooding and erosion events, loss in catchment area, and subsequent impact on downstream values such as Bonnie Pools (Inland Waters, Landforms and Social Surroundings),
- Increased sediment loads in watercourses and potential downstream impacts to sensitive areas from water quality impacts, such as Bonnie Pools (Inland Waters and Social Surroundings), and
- Introduction and spread of weeds which can outcompete conservation and culturally significant flora, reduce the quality of fauna habitat, increase feral herbivore activity and increase the risk of bushfires (Flora and Vegetation, Social Surroundings and Terrestrial Fauna).

Therefore, through the clearing of vegetation, which primarily affects Flora and Vegetation, the Proposal has the potential to result in impacts to Terrestrial Fauna by removing and altering fauna habitat, or direct mortality through collision with construction machinery. Clearing of vegetation may also impact inland waters, with impacts to the hydrology of surface water features surrounding the Proposal through altering surface water flow paths or volumes,

through increased sediment loads and through erosion of watercourse banks. Impacts to Social Surroundings may arise from these impacts to Terrestrial Fauna and watercourses, in particular on Aboriginal cultural heritage values, given the cultural significance of watercourses (including Bonnie Pool) and fauna occurring in the DE.

Vegetation units and vegetation associations, as per Beard *et al.,* (2013) will not be cleared to an extent that will reduce the remaining vegetation below 30%, with over 98% of all vegetation associations remaining at the State level, Pilbara IBRA bioregional and Chichester subregional levels, of the Local Government Area (Shire of East Pilbara). Therefore, clearing of vegetation for this Proposal will not lead to compounding impacts at a regional scale that would result in significant effects on the identified environmental values and their connections, including the provision of habitat for conservation and culturally significant flora and fauna species.

The longer-term impacts of the Proposal to both Flora and Vegetation and Terrestrial Fauna will be predominantly mitigated through progressive and post-construction rehabilitation, which seeks to restore environmental values impacted throughout the implementation of the Proposal. Application of offsets will counterbalance potential operational impacts and residual significant construction impacts, while successful rehabilitation following construction and decommissioning will mitigate long-term effects on vegetation communities and fauna habitats. This, in turn, will minimise potential long-term impacts to fauna of cultural significance to the Traditional Owners.

Vegetation clearing can lead to changes in overland (surface water runoff) flow paths and quantities and quality of runoff entering waterways, which are considered culturally significant within the DE. The potential for changes to overland flows as a result of vegetation clearing for the Proposal is considered to be low, due to the nature and scale of the Proposal within the wider landscape. Vegetation clearing will be narrow and predominantly linear in nature, thereby reducing the extent of unimpeded overland flows adjacent to waterways. To minimise the potential for erosion and destabilised banks, vegetation removal adjacent to the banks has been reduced through avoidance measures during the design process. As detailed in Chapter 10.1, the turbine and associated hardstand areas/supporting infrastructure have been designed outside of the 1% AEP floodplain area. Therefore, downstream impacts on sensitive receptors (including Bonnie Pool) are expected to be negligible (Fortescue, 2025; Fortescue, 2024). Further measures to control sediment runoff during the construction phase are outlined in Section 10.1.6.3 and will be considered in the Construction Environment Management Plan (CEMP) to be produced by the appointed contractor. Further areas that do not require permanent clearing will be progressively rehabilitated throughout construction. As such, potential for erosion impacts are considered minimal.

Changes to surface water flow paths, quantity, and quality can harm riparian vegetation health and, due to the cultural significance of Bonnie Pools and creeks within the DE, may result in a broader impact on Social Surroundings. Impacts to riparian vegetation through changes to surface water quality and flows have been assessed in Section 10.1.5. Impacts were determined to be not significant, as the Proposal's potential impacts on surface water flow are expected to be localised, mainly associated with turbine access tracks and waterway crossings, with negligible disruptions to regional flows downstream. In addition, the major creek crossings have been engineered to maintain natural flow paths as far as possible through the iterative design process undertaken, and the locations were selected through consultation with Traditional Owners as the areas with minimal potential cultural impacts.

Clearing activities and associated vehicle movements can introduce invasive plant species. These weeds can outcompete native flora species, leading to reduced plant diversity and altered habitat structure. High weed coverage can alter fire regimes by increasing flammable biomass, which may increase the frequency and intensity of bushfires, further degrading vegetation and habitat quality for flora and fauna. High weed coverage can also impact Inland Waters, if weeds spread along creeks and drainage lines. It is anticipated that the introduction and spread of weeds will be adequately controlled during the construction and operations phase through the implementation of specific weed management measures. With, all works to be undertaken in accordance with Fortescue's Weed Management Plan (Reference: 45-PL-EN-0033), provided in Appendix E, as the standard operating procedure, such that no significant holistic impacts would occur across the impacted environmental factors.

Overall, the proposed mitigation and management measures for each environmental factor, as summarised in Table 11-1, along with offsets to address impacts on Flora and Vegetation, will ensure that impacts on other environmental factors, including Terrestrial Fauna, Social Surroundings, and Inland Waters, align with the EPA's environmental objectives.

11.2.2 General Construction and Operational Maintenance Activities

The construction period for the Proposal is anticipated to take up to 34 months. Combined impacts resulting from vegetation clearing during construction are addressed above. Other construction activities (such as operation of plant and machinery, earthworks, and installation of infrastructure), and to a lesser extent some operational maintenance activities, can simultaneously increase noise, dust and artificial light emissions, increase the risk of spills and attract feral fauna to the DE, resulting in combined impacts to Terrestrial Fauna, Flora and Vegetation, Inland Waters, Terrestrial Environmental Quality and Social Surroundings. General construction activities can lead to the following combined impacts:

- Disturbance to fauna and cultural values from noise and vibration (Terrestrial Fauna and Social Surroundings),
- Increased dust emissions generated during construction can settle on plants, affecting the health of flora and vegetation of conservation and cultural significance (Flora and Vegetation, and Social Surroundings),
- Attraction of feral animals causing impacts to flora and vegetation, and terrestrial fauna of conservation and cultural significance through predation, competition and degradation of habitat (Flora and Vegetation, Terrestrial Fauna and Social Surroundings,
- Disturbance of fauna and Social Surroundings from artificial lighting (Terrestrial Fauna and Social Surroundings), and
- Contamination of soil and watercourses through accidental spills (Flora and Vegetation, Terrestrial Fauna, Terrestrial Environmental Quality, Inland Waters and Social Surroundings).

Holistic impacts on Flora and Vegetation, Terrestrial Fauna and Social Surroundings receptors may arise from combined disturbances during construction, including noise and vibration, artificial lighting, and increased dust emissions. Noise, vibration and light emissions can cause fauna to avoid certain areas, and given the cultural significance of some species (as discussed in Chapter 8), this may affect the Traditional Owners' abilities to continue their traditional use

of/practices on country. Dust emissions can settle on plants and affect the health of flora and vegetation, and given the cultural significance of some species, this may also impact Traditional Owners' ability to use these species. However, with the implementation of the mitigation measures in Chapter 9, the CEMP produced by the appointed contractor and the mitigation measures outlined in Table 11-1, potential impacts of noise, vibration, lighting and dust will be minimised to a level where they are not considered significant, either individually or holistically. In addition, any impacts from disturbance during construction will be temporary, for intermittent periods, and therefore no long-term significant holistic impacts on surrounding receptors are likely.

Attraction of feral animals due to construction activities may degrade flora and vegetation quality and impact fauna through predation, competition and degradation of habitat. Given the cultural significance of some flora and fauna species (as discussed in Chapter 9), this may affect the Traditional Owners' abilities to continue their traditional use of/practices on country.

Construction activities have the potential to impact on Terrestrial Environmental Quality and Inland Waters through accidental contamination incidents. This could lead to holistic impacts on Social Surroundings given the cultural value of Bonnie Pools and creeks within the DE. Should the water quality be impacted, it could affect the Traditional Owners' spiritual and physical connection to the land. It could also impact fauna or vegetation that rely on these watercourses. Similarly, the Stormwater Management Plan will include pollution prevention measures to minimise the risk of spills and reduce the potential for significant land or water contamination.

Overall, it is considered that the proposed mitigation and management measures, as summarised in Table 11-1, and the implementation of an EMP, will ensure impacts on values that are interconnected between the identified factors are likely to be consistent with the EPA's environmental factor objectives.

11.2.3 Works Affecting Watercourses

Several elements of the Proposal interact with Inland Waters, including construction of watercourse crossings. Inland surface waters are linked to vegetation health, terrestrial fauna (e.g. important for species such as the Pilbara Olive Python) and Social Surroundings (significance for Aboriginal Cultural Heritage). Disruptions to these systems can affect both above ground and below ground biodiversity, as well as social surroundings due to their cultural significance. As discussed in Chapter 10.1, construction and operational water requirements will be supplied from the existing borefield, approved under GWL171278(7). Therefore, as groundwater abstraction has already been accounted for, this aspect of Inland Waters is not considered here. The combined impacts associated with works affecting water resources include:

- When disturbed, ASS can release sulfuric acid, lowering pH levels in surface waters. This can lead to toxic conditions that harm aquatic life and reduce soil fertility. Acidification can leach heavy metals into waterways, contaminating drinking water supplies and affecting both terrestrial and aquatic organisms (Inland Waters, Flora and Vegetation, Social Surroundings and Terrestrial Fauna),

- The construction of watercourse crossings or other infrastructure can alter natural water drainage patterns or increase erosion rates (Inland Waters, Social Surroundings, Landforms and Terrestrial Environmental Quality), and

- Impacts to watercourses can affect Traditional Owners' spiritual and physical connection to the land due to the cultural significance of these water resources (Inland Waters and Social Surroundings).

Given the interconnected nature of several environmental factors related to the water resources within the DE, there is potential for combined impacts on receptors associated with all factors considered in this assessment. Changes to the volume or quality of surface water may impact the health of fauna habitat and vegetation, particularly habitats associated with riparian vegetation. The hydrological assessment concluded that the design and layout of the Proposal are expected to have minimal impact on the existing surface water flow regime, with any changes being localised, primarily around turbine access tracks and waterway crossings, and negligible increases in flood depths and velocities. Therefore, effects on surface watercourses are anticipated to be negligible and the associated holistic impacts related to erosion rates, riparian vegetation or cultural significance would not be significant.

The potential impacts from the disturbance of ASS could affect Inland Waters (surface watercourses), Social Surroundings and Terrestrial Environmental Quality, leading to holistic impacts on these receptors. The mobilisation of ASS in the DE could degrade the water quality of the creeks, potentially affecting the Traditional Owners' spiritual and physical connection to the land due to the cultural significance of the watercourses. This could also affect fauna that rely on the watercourse and negatively impact vegetation health. The mitigation measures outlined in Section 10.2.5, and subsequent CEMP produced by the appointed contractor, during construction will minimise impacts to a level where they are not considered significant, either individually or holistically.

11.2.4 Holistic Impact Assessment Summary

Overall, it is considered that the proposed mitigation and management measures (Table 11-1) together with conditions from other approval instruments, such as the Groundwater Licence under the RIWI Act, will ensure that impacts on interconnected environmental factors, including the values associated with Terrestrial Fauna, Landforms, Terrestrial Environmental Quality, Social Surroundings, Flora and Vegetation, and Inland Waters, are likely to align with the EPA's environmental factor objectives.

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Table 11-1: Holistic Impact Assessment Summary

Proposal activity	Holistic impacts	Mitigation and management measures	Offsets relevant?	EPA objective achieved?	Additional mitigation required for holistic impact?
Vegetation and land clearing	• Loss of Priority flora and supporting habitat. • Loss of culturally significant flora. • Loss of habitat (including mesa habitat) and habitat fragmentation for conservation significant and culturally significant fauna species. • Direct fauna mortality through collisions with construction and operational plant and machinery. • Altered surface water regimes resulting in a potential increase in flooding and erosion events, loss in catchment area. • Introduction and spread of weeds, outcompeting flora and fauna and increasing risk of bushfires.	• Where significant flora or vegetation occurs close to the IDF clearing areas will be demarcated prior to construction activities to protect the conservation significant flora species and vegetation from impacts such as accidental clearing or disturbance (Chapter 7). • Areas to be cleared will be demarcated on the ground (either physically or using GPS enabled methods) (Chapter 7). • Comprehensive weed hygiene management through implementation of specific weed management measures. With, all works to be undertaken in accordance with Fortescue's Weed Management Plan (Reference: 45-PL-EN-0033) as the standard operating procedure (Chapter 7). • Strict speed limits will be enforced during dawn and dusk in order to avoid fauna strikes during clearing and construction (Chapter 8). 480.81 ha (this includes 13.94 ha of areas previously cleared by other activities not related to this Proposal) will be progressively rehabilitated once construction is complete to reduce impacts to floral and vegetation over time, including potential fragmentation (in accordance with Fortescue's standard procedures including Rehabilitation and Revegetation	Yes - monetary contribution will be made into the Pilbara Environmental Offset Fund.	Yes – When considered holistically, the likely environmental effects from the Proposal will not result in combined environmental effects that significantly impact the environment as a whole.	No

Proposal activity	Holistic impacts	Mitigation and management measures	Offsets relevant?	EPA objective achieved?	Additional mitigation required for holistic impact?
		Monitoring Procedure (Reference: 45-GU-EN-0009) (Chapter 7).			

Disturbance from construction and operational maintenance activities	• Disturbance to fauna and social surroundings from noise and vibration.
	• Increased dust emissions generated during construction can settle on plants, affecting the health of flora and vegetation of conservation and cultural significance.
	• Attraction of feral animals causing impacts to flora and vegetation, and terrestrial fauna of conservation and cultural significance through predation, competition and degradation of habitat.
	• Disturbance of fauna and areas of cultural significance from artificial lighting.
	• Contamination of soil and watercourses through accidental spills.
		• Dust deposition will be managed through standard construction measures (e.g., water application) to minimise dust generation and avoid impacts on vegetation in line with standard dust management measures (Chapter 7).
		• All food waste will be removed from site at the end of each shift. Waste will be stored at the depot and regularly removed to minimise attraction of feral animals (Chapter 8).
		• Lighting will be designed and managed in accordance with the National Light Pollution Guidelines for Wildlife (DCCEEW, 2023c) (Chapter 8).
		• Standard construction noise management measures will be implemented (Chapter 8), including:
		  ○ Machinery and vehicles are regularly serviced and operated/maintained in accordance with the manufacturer's specifications, and preferential use of modern equipment that generally operate more quietly.
		  ○ Using techniques that reduce noise, such as employing hydraulic, rather than impact, methods. Training workers on best practices for minimising noise.
			No	Yes – When considered holistically, the likely environmental effects from the Proposal will not result in combined environmental effects that significantly impact the environment as a whole.	No

Proposal activity	Holistic impacts	Mitigation and management measures	Offsets relevant?	EPA objective achieved?	Additional mitigation required for holistic impact?
		○ Plant and machinery on site will be switched off and not left idling when not in use. • Scheduling the construction activities to ensure the noisiest tasks occur during times that will cause the least disturbance. • Undertake blasting activities in accordance with Fortescue's Blasting Near Heritage Place Procedure (100-PR-HE-0003) (Chapter 9). • Any identified ASS will be managed in accordance with 'Treatment and management of soil and water in acid sulfate soil landscapes' (DWER, 2015) (Chapter 10). • Spills will be managed through standard site pollution prevention measures (Chapter 10).			
Works affecting watercourses	• When disturbed, ASS can affect quality of surface waters. This can lead to toxic conditions that harm aquatic life and reduce soil fertility, affecting both terrestrial and aquatic organisms. • The construction of watercourse crossings or other infrastructure can alter natural water drainage patterns or increase erosion rates.	• Culturally significant water sources are recorded in Fortescue's GIS system as Heritage Places or Heritage Restriction Zones (Chapter 9). • Pole and turbine locations located outside of high flow areas, where required to be installed within rivers (Chapter 10). • A surface water management plan will be developed and implemented to manage flood risk and minimise soil erosion and the potential for the transport of sediment	No	Yes – When considered holistically, the likely environmental effects from the Proposal will not result in combined environmental effects that significantly impact the environment as a whole.	No

Proposal activity	Holistic impacts	Mitigation and management measures	Offsets relevant?	EPA objective achieved?	Additional mitigation required for holistic impact?
	• Impacts to watercourses can affect Traditional Owners' spiritual and physical connection to the land due to the cultural significance of these water resources.	to downstream waters during the construction phase (Chapter 10). • Construction and maintenance of the waterway crossings will be scheduled outside of the wet season where possible, or for a time period when rainfall and runoff are unlikely (Chapter 10). • Erosion control measures will be installed at the inlet and outlet of the culvert structures to minimise the risk of bed and bank erosion and local scour, and to prevent undermining of the structures (Chapter 10). • The floodway batters and driving surface will be armoured to minimise erosion and scour as water flows over the road (Chapter 10), • Permit to be in place prior to interferences with the bed or banks of a watercourse under the RIWI Act, and • Clearing of riparian vegetation will be avoided and minimised where possible.			

12 OFFSETS

12.1 Background

The WA Environmental Offsets Guidelines (GoWA, 2014) defines environmental offsets as '*actions that provide environmental benefits which counterbalance the significant residual environmental impacts or risks of a project or activity*'. Unlike mitigation actions, which are implemented on-site to reduce the direct impacts of the project, offsets are undertaken outside of the project area and counterbalance significant residual impacts.

Environmental offsets are applied when the residual impacts of a project are deemed significant, after efforts to avoid, minimise, and rehabilitate have been exhausted. As outlined in Chapters 7 and 8, the Proposal may result in significant residual impacts on flora and vegetation, as well as terrestrial fauna habitat. In response to these potential impacts, Fortescue intends to implement an environmental offset strategy which is proportionate to the scale and significance of the residual environmental impact.

Fortescue proposes to use the Pilbara Environmental Offsets Fund (PEOF) as the offsets mechanism for the Proposal with the intention of maximising regional biodiversity benefits.

12.2 WA Environmental Offsets Policy

The WA Environmental Offsets Policy (GoWA, 2011) requires the following Principles to be considered when developing an offset proposal:

- Environmental offsets will only be considered after avoidance and mitigation options have been pursued,
- Environmental offsets are not appropriate for all projects,
- Environmental offsets will be cost-effective, as well as relevant and proportionate to the significance of the environmental value being impacted,
- Environmental offsets will be based on sound environmental information and knowledge,
- Environmental offsets will be applied within a framework of adaptive management, and
- Environmental offsets will be focussed on longer term strategic outcomes.

An assessment of the residual impacts of the Proposal as outlined in the Environmental Offset Guidelines (GoWA, 2014) is provided below in Table 12-1.

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Table 12-1: Residual Impact Significance Model

Residual impact classification	Flora and Vegetation	Terrestrial Fauna
Residual impact that is environmentally unacceptable or cannot be offset	None	None
Significant residual impacts that will require an offset – All significant residual impacts to species and ecosystems protected by statute or where the cumulative impact is already at a critical level	• Permanent clearing of 427.5 ha of 'Good to Excellent' condition vegetation	• Permanent clearing of up to 8.09 ha of habitat that is identified as habitat critical to the survival of the Northern Quoll.
Significant residual impacts that may require an offset – Any significant residual impact to potentially threatened species and ecosystems, areas of high environmental value or where the cumulative impact may reach critical levels if not managed	None	• Permanent clearing of up to 15.71 ha of habitat that is identified as habitat critical to the survival of the PLNB and Ghost bat.
Residual impacts that are not significant	• Clearing of 47.94 ha of Regionally Significant vegetation ('Four plant assemblages of the Wona Land System' PEC (P1, P3), Potential 'Four plant assemblages of the Wona Land System' PEC (P1, P3), groundwater dependent vegetation, potential groundwater dependent vegetation, habitat for Priority flora species). • Clearing of seven conservation significant flora species, including: ○ *Dolichocarpa* sp. Hamersley Station (A.A. Mitchell PRP 1479) (P3): 23 individuals. ○ Euphorbia inappendiculata var. queenslandica (P3): 72 individuals. ○ Lotasperma sessilifolium (P3): 1 individual. ○ *Neptunia longipila* (P3): 10 individuals. ○ Paspalidium retiglume (P2): 1 individual. ○ *Swainsona thompsoniana* (P3): 18 individuals. ○ *Ptilotus mollis* (P4): 35 individuals.	• Loss of 910.26 ha of fauna habitat. Post construction rehabilitation will help re-establish fauna habitat in some disturbed areas. There will be some permanent loss of habitat for drainage line/river/creek (major), drainage line/river/creek (minor), granite outcrops (flat dome), plain (cracking clays), plain (stony/gibber), rocky escarpments (ridges/mesa/cliffs/outcrops/ breakaways), and woodland (open). • Given the linear nature of the Proposal, the infrastructure and associated clearing will fragment some areas of habitat. • A residual risk of collision with the operational infrastructure with some significant fauna species will remain, including listed Threatened and Migratory bird species.

Residual impact classification	Flora and Vegetation	Terrestrial Fauna
	○ The Proposal IDF will intersect occurrences of conservation significant flora species. ○ The Proposal may indirectly impact three conservation-significant species: • *Paspalidium retiglume* (P2): 100 individuals • *Euphorbia inappendiculata* var. *queenslandica* (P3): 270 individuals. • *Ptilotus mollis* (P4): 105 individuals. • As a result of the fragmentation of PEC patches and potential edge effects, 200.83ha of VfAl may be indirectly impacted by the Proposal, including: • 177.78 ha of 'Four plant assemblages of the Wona Land system' PEC (P1, P3) • 23.05 ha of potential 'Four plant assemblages of the Wona Land system' PEC (P1, P3).	

12.3 Pilbara Environmental Offsets Fund

The Pilbara Conservation Strategy outlines a landscape-scale approach to biodiversity conservation across the Pilbara region and provides strategic direction for conservation actions that may be funded from a variety of sources, including through offsets to counterbalance the residual impacts of infrastructure projects (GoWA, 2023). The top four outcomes that will be delivered through the Pilbara Conservation Strategy are (GoWA, 2023):

1. Landscape-scale conservation through improved management of key threats,
2. Improved condition of threatened and other important species and communities,
3. Evidence-based conservation management, and
4. Conservation through partnerships.

The outcomes “Landscape-scape conservation through improved management of key threats” and “Evidence-based conservation management” are relevant to the significant residual impacts of the Proposal to flora and vegetation, and terrestrial fauna.

Of these outcomes, “Improved condition of threatened and other important species and communities” is of particular relevance to the Proposal and the predicted significant residual impacts resulting from clearing of habitat critical to the survival of the Northern Quoll. The Pilbara Conservation Strategy specifically notes the Northern Quoll, among other species, as one of the species that is the focus of this objective (GoWA, 2017). The clearing of habitat critical to the survival of the PLNB and Ghost Bat is also potentially significant and may require offsetting. The Pilbara Conservation Strategy also outlines a number of priority areas that will be the focus of the projects implemented to meet the objectives of the Strategy.

In July 2016, the WA Government approved the establishment of the Pilbara Strategic Conservation Initiative, now known as the Pilbara Environmental Offsets Fund (the ‘fund’), to maximise the value of environmental offsets from projects in the Pilbara (GoWA, 2023). The fund facilitates the coordinated delivery of environmental offset projects within the Pilbara bioregion of WA. The fund was established to invest in strategic conservation projects in the Pilbara bioregion to improve vegetation and species habitat impacted by development. The fund combines money from individual offset payments required under the WA EP Act and the EPBC Act into a special purpose account. This enables the delivery of larger and more strategic landscape-scale projects than would occur if individual offset projects were delivered independently, leading to better biodiversity conservation outcomes (DWER, 2019).

Fortescue recognises that the effective implementation of offsets in the Pilbara is hampered by the region’s unique land tenure (being all Crown land with overlapping mining, native title and pastoral interests). This makes traditional land acquisition and access for on-ground offset activities difficult. The fund was established to overcome these barriers and as such, Fortescue proposes to use the fund to facilitate offsets for the Proposal. Table 12-2 outlines how the use of fund is consistent with the Principles of the WA Environmental Offsets Policy (GoWA, 2011).

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Table 12-2: Proposed offset strategy's consistency with the Principles of the WA Environmental Offsets Policy

Principle	How the proposed offset strategy addresses this
Environmental offsets will only be considered after avoidance and mitigation options have been pursued.	As detailed in Sections 7.6, 8.6, 9.6, and 10, avoidance and mitigation measures have been implemented wherever practicable.
Environmental offsets are not appropriate for all projects.	The Proposal is appropriate for environmental offsets, particularly in light of the availability of the Pilbara Environmental Offset Fund. Fortescue recognises that the effective implementation of offsets in the Pilbara is hampered by the region's unique land tenure (being all crown land with overlapping mining, native title and pastoral interests). This makes traditional land acquisition and access for on-ground offset activities difficult. The fund was established to overcome these barriers and as such, Fortescue proposes to use the fund to facilitate offsets for the Proposal.
Environmental offsets will be cost-effective, as well as relevant and proportionate to the significance of the environmental value being impacted.	The offset rates paid to the fund are established by DWER and are '*based on the level of biodiversity protection in the region, and cumulative impacts to environmental values, including high quality vegetation and the conservation of significant-species habitat (DWER 2019)*'. These rates include base rates for Good to Excellent quality vegetation and 'higher rates' for specialised environmental values such as Threatened fauna habitat. It is anticipated that the higher rate will apply to offset clearing of habitat critical to the survival of Northern Quoll in the northern portion of the DE. The higher rate will also apply if offsetting is required for clearing of PLNB and Ghost Bat critical habitat. It is further anticipated that the base rate will apply to offset clearing of vegetation in Good to Excellent condition. As such, it is considered that the proposed offsets are proportionate to the level of statutory protection that applies to the environmental values being impacted.
Environmental offsets will be based on sound environmental information and knowledge.	The fund has an Implementation Plan which outlines the criteria that are used to select projects that are supported through the fund. These criteria include (DWER, 2019): *"Be designed to align with the offset principles of the Western Australian and Australian governments and the implementation principles in Chapter 2 (of the Implementation Plan) so that the outcomes of projects:* • *Tangibly and measurably improve environmental matters,* • *Are value for money and have a high chance of success,* • *Are strategic and have landscape-scale outcomes where achievable,* • *Are long term and enduring (ideally outcomes will endure for at least 20 years), and* • *Are additional to activities that are already required as a condition of approval or lease or a legislative requirement"*

Principle	How the proposed offset strategy addresses this
Environmental offsets will be applied within a framework of adaptive management.	The fund Implementation Plan states that "*The fund will be adaptively managed to plan, implement, monitor, evaluate and adjust its delivery over time*" (DWER, 2019). The Governance Framework for the fund states that "*Evaluation of the strategic objectives, outcomes and priorities of the Implementation Plan will be completed every three years to inform adaptive management of the Fund, consistent with Principle 5 of the WA Offset Policy which is that 'environmental offsets will be applied within a framework of adaptive management'*" (DWER, 2019). Impact Seed (2024) were commissioned by DWER on behalf of the PEOF board to undertake an evaluation of PEOF. This review concluded that there are several complex factors preventing PEOF projects being approved and delivered, and therefore preventing PEOF from achieving its intended environmental outcomes. The following strategic recommendations were identified: • *"Undertake an options analysis and risk assessment to determine the immediate next steps for PEOF.* • *Determine an approach and allocate resourcing to address cross-government issues relevant to PEOF.* • *Review and reform policies to enable flexible application."* Additionally, the following design and implementation actions were recommended: • *"Refine, optimise and clarify governance structures that support PEOF.* • *Review capabilities and resources needed to deliver PEOF.* • *Review PEOF offset pricing."* Incorporation of these recommendations aims to improve the PEOF process and aid the implementation of effective offset projects.
Environmental offsets will be focussed on longer term strategic outcomes.	Strategic focus items of the fund relevant to longer term strategic outcomes include: • Projects will maintain a strategic, landscape-scale focus, and • Projects will balance significant impacts identified in state and Commonwealth approvals, reducing duplication and allowing strategic project delivery. The funds approach of combining money from offsets under the EP Act and EPBC Act to deliver larger and more strategic landscape-scale projects than would occur if individual offset projects were delivered independently, effectively manages the risk of offsets not succeeding when compared to smaller individual offset projects implemented by Proponents. The benefit of contributing to strategic landscape-scale projects also includes the opportunity to achieve net ecological gain due to a coordinated approach and the ability to achieve positive biodiversity outcomes on a large scale outside of the project's IDF.

12.4 Significant Residual Impacts

The significant residual impacts of the Proposal, with reference to the Pilbara Environmental Offsets Fund, include:

- Permanent clearing of 427.5 ha of 'Good to Excellent' condition vegetation, and
- Permanent clearing of 8.09 ha of habitat critical to the survival of the Northern Quoll.
- Permanent clearing of 122.13 ha of critical supporting habitat for the Northern Quoll.

Potentially significant residual impacts of the Proposal, with reference to the Pilbara Environmental Offsets Fund, include:

- Permanent clearing of 15.71 ha of habitat critical to the survival of the PLNB and Ghost Bat.
- Permanent clearing of 434.47 ha of supporting habitat for the Northern Quoll, PLNB and Ghost Bat.

12.5 Implementation

It is envisaged that the conditions of any approval for the Proposal under the EP Act will require Fortescue to contribute to the fund. An Impact Reconciliation Procedure will be developed for approval by the DWER CEO.

Impact Reconciliation Reports (IRR) will then be submitted biennially (from the time the Proposal is approved). The IRR will advise DWER on the amount of clearing that has been undertaken each year during the biennial reporting period. This clearing is then used to define the financial contribution to the fund for areas cleared during the reporting period, with the rate per hectare determined in accordance with the fund's implementation plan. The calculations for the fund include a base rate for vegetation in Good to Excellent condition, and a higher rate for areas of specialised environmental values (Northern Quoll critical habitat and potentially PLNB and Ghost Bat critical habitat).

12.6 Offsets Fund Contribution

Based on the Pilbara Environmental Offsets Fund Implementation plan (DWER, 2019), it is expected that Fortescue will be required to pay a rate per hectare of impact to native vegetation in Good to Excellent condition, and for the critical habitat for the Northern Quoll. It has conservatively been assumed that an offset will be required for the potentially significant residual impact from clearing of PLNB and Ghost Bat critical habitat.

The base rate will apply for "impacts to native vegetation in Good to Excellent condition, which may include impacts to fauna habitat (including threatened fauna)". It is noted that The Proposal is located within the Chichester subregion and the Fortescue subregion and therefore two rates will apply across these subregions.

However, it is expected that a higher rate will apply to the Proposal's impact on critical habitat for Threatened fauna species (the Northern Quoll, PLNB and Ghost Bat) (DWER, 2019). There are some areas of Northern Quoll, PLNB and Ghost Bat critical habitat that overlap vegetation

in ‘Good’ to ‘Excellent’ condition. To avoid double offsetting, these overlapping areas will be offset at the higher rate, and the base rate will not be applied.

The estimated financial contribution is based on the 2024/2025 rates as published on the PEOF website (GoWA, 2024), and anticipated hectares to be **permanently cleared**. However, the financial contribution will be based on actual **permanent clearing**, and this can only be calculated after clearing has been conducted.

It is anticipated that the value of expenditure per hectare of clearing will be annually adjusted in accordance with the Perth All Groups Consumer Price Index (CPI) fluctuations from 1 July 2026. The Australian Bureau of Statistics (ABS) publish the annual CPI for Australian cities in September of each year and will be referenced when calculating the annual adjustments.

Table 12-3: Significant Residual Impacts Requiring an Offset*

IBRA Subregion	Environmental feature	Permanent clearing area (ha)	Contribution	Offset rate	Total
Chichester Subregion	**Permanent clearing** of habitat critical to the survival of the Northern Quoll, PLNB and Ghost Bat, and critical supporting habitat for the Northern Quoll.	137.84	Based on DWER (2019), it is expected that a **higher rate** per hectare of clearing should be contributed to the fund for the 137.84 ha of critical habitat and critical supporting habitat associated with these species.	$1,920.00	$264,652.80
	Permanent clearing of supporting habitat for the Northern Quoll, PLNB and Ghost Bat.	434.47	Based on DWER (2019), it is expected that the base rate per hectare of clearing should be contributed to the fund for the 434.47 ha of supporting habitat associated with these species.	$960.00	$417,091.20
	Permanent clearing of ‘Good to Excellent’ condition vegetation that does not overlap the Northern Quoll, PLNB and Ghost Bat critical in the above row.	412.62	Based on DWER (2019), it is expected that the **base rate** per hectare of clearing should be contributed to the fund for the 935.52 ha of vegetation in ‘Good’ to ‘Excellent’ condition.	$960.00	$396,115.20

*Note that these calculations have conservatively assumed that the potentially significant residual impact of clearing PLNB and Ghost Bat critical habitat requires offsetting.

13 CONCLUSION

PEG, a wholly owned subsidiary of Fortescue, is proposing to develop the Bonney Downs Wind Farm, comprising of wind generation for power supply.

The Proposal includes the installation of up to 100 wind turbines and six substations, with a total capacity of up to 2.1 GW. The Proposal involves disturbance of up to 944.07 ha within an 89,973.86 ha DE.

The Proposal has the potential to adversely impact the environmental and social values within the DE. These factors and any significant residual impacts are discussed below.

Flora and Vegetation

To protect flora and vegetation so that biological diversity and ecological integrity are maintained.

The Proposal will result in the clearing of 910.26 ha of native vegetation. The following significant residual impacts are expected after mitigation measures are applied:

- Permanent clearing of 427.5 ha of 'Good to Excellent' condition vegetation. An environmental offset is proposed for this residual impact.

Other potential impacts on flora and fauna are not significant at the local or regional scale. The avoidance and minimisation of impacts, as well as offsetting of the significant residual impact (see Chapter 7) will result in the biological diversity and ecological integrity of the study area being maintained. The Proposal is therefore consistent with the EPA's environmental objective for flora and vegetation.

Terrestrial Fauna

To protect terrestrial fauna so that biological diversity and ecological integrity are maintained.

The Proposal will result in the clearing of 910.26 ha of fauna habitat, some of which provides habitat for conservation significant fauna. Residual impacts to Northern Quoll habitat critical for the survival of the species are expected after mitigation measures are applied, as following:

- Permanent clearing of no more than 8.09 ha of rocky escarpments (ridges/mesa/cliff/outcrops/breakaways) in the northern portion of the DE.

- Permanent clearing of 122.13 ha of critical supporting habitat for the Northern Quoll.

Potentially significant residual impacts to PLNB and Ghost Bat habitat critical for the survival of the species are expected after mitigation measures are applied, as following:

- Permanent clearing of no more than 14.88 ha of rocky escarpments (ridges/mesa/cliff/outcrops/breakaways) in the DE, and

- Permanent clearing of no more than 0.83 ha of drainage Line/River/Creek (major) in the DE.

Other potential direct and indirect impacts to terrestrial fauna associated with the Proposal will not be significant at a local or regional scale. The avoidance and minimisation of impacts, as

well as offsetting of the significant residual impacts (see Chapter 12) will result in the biological diversity and ecological integrity of the study area being maintained. The Proposal is therefore consistent with the EPA's environmental objective for terrestrial fauna.

Social Surroundings

To protect the factors included in Social Surroundings from significant harm.

No impacts to nearby towns, surrounding industry, visual amenity, landscape or non-Aboriginal heritage are anticipated to occur as a result of the Proposal. Additionally, dust impacts from the Proposal are not expected to have a significant impact on Social Surroundings.

Potential impacts from noise are anticipated at Bonney Downs Homestead that will exceed target noise levels. Fortescue is committed to mitigating noise exceedances at the Bonney Downs Homestead through the implementation of appropriate mitigation measures to ensure noise levels remain within the prescribed thresholds during operation.

Fortescue is committed to minimising impacts on Heritage Places in all of its project areas which includes wherever possible avoidance of impacts on Heritage Places. Where the Proposal cannot avoid impact to Heritage Places or potential Heritage Places, Fortescue will consult with Palyku and Nyiyaparli and apply for relevant approvals under the AH Act. Fortescue will comply with the AH Act and any approval conditions set by the Minister of Aboriginal Affairs at all times during construction and operation of the Proposal. With respect to access to country, dust management on heritage places, culturally significant plants and animals, and water sources, Fortescue will continue to consult with Palyku and Nyiyaparli to ensure that impacts are minimised.

No significant residual impacts to social surroundings have been identified and the EPA's objective for the Social Surroundings factor 'to protect social surroundings from significant harm' can be met.

Other Factors

Through the implementation of standard mitigation measures and controlled through other consenting regimes (e.g. RIWI Act), no significant impacts are anticipated as a result of the Proposal with regard to inland waters, terrestrial environmental quality and landforms.

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APPENDIX A BONNEY DOWNS CONSOLIDATED FLORA AND VEGETATION ASSESSMENT (ECOLOGIA, 2025A)

APPENDIX B ENVIRONMENTAL MANAGEMENT PLAN

APPENDIX C FORTESCUE GROUND DISTURBANCE AND TOPSOIL MANAGEMENT PROCEDURE

APPENDIX D FORTESCUE REHABILITATION AND REVEGETATION MONITORING PROCEDURE

APPENDIX E FORTESCUE WEED MANAGEMENT PLAN

APPENDIX F TERRESTRIAL VERTEBRATE FAUNA SURVEY (ECOLOGIA, 2025B)

APPENDIX G SHORT-RANGE ENDEMIC TERRESTRIAL INVERTEBRATE ASSESSMENT FOR THE BONNEY DOWNS ENERGY GENERATING HUB (HARRY BUTLER INSTITUTE, 2024)

APPENDIX H BIRD AND BAT SITE UTILISATION SURVEY (ECOLOGIA, 2026)

APPENDIX I BIRD AND BAT ADAPTIVE MANAGEMENT PLAN (FORTESCUE, 2026)

APPENDIX J BIRD AND BAT MANAGEMENT PLAN SCIENCE FOR WIND ENERGY DEVELOPMENTS – LITERATURE REVIEW AND BAT TRAITS ANALYSIS (HBI, 2026)

APPENDIX K BIRD AND BAT MANAGEMENT PLAN SCIENCE FOR WIND ENERGY DEVELOPMENTS – COLLISION RISK MODELLING OUTCOMES (HBI 2026B)

APPENDIX L REGISTERED AND LODGED ABORIGINAL HERITAGE PLACES WITHIN THE DEVELOPMENT ENVELOPE

Appendix M Culturally Significant Plants and Animals

APPENDIX N BONNEY DOWNS WIND FARM NOISE ASSESSMENT

APPENDIX O BONNEY DOWNS FAUNA NOISE IMPACT STUDY

APPENDIX P BONNEY DOWNS WIND GENERATION HUB VISUAL IMPACT ASSESSMENT

APPENDIX Q BONNEY DOWNS WIND FARM DUST ASSESSMENT

APPENDIX R BONNEY DOWNS BASELINE HYDROLOGY STUDY (ADVISIAN, 2023)

APPENDIX S BONNEY DOWNS – POST DEVELOPMENT HYDROLOGY STUDY (WIND GENERATION PROJECT) (FORTESCUE, 2024)

APPENDIX T BONNEY DOWNS WIND GENERATION HUB: DESKTOP SOIL AND LANDFORM ASSESSMENT (LANDLOCH, 2025)