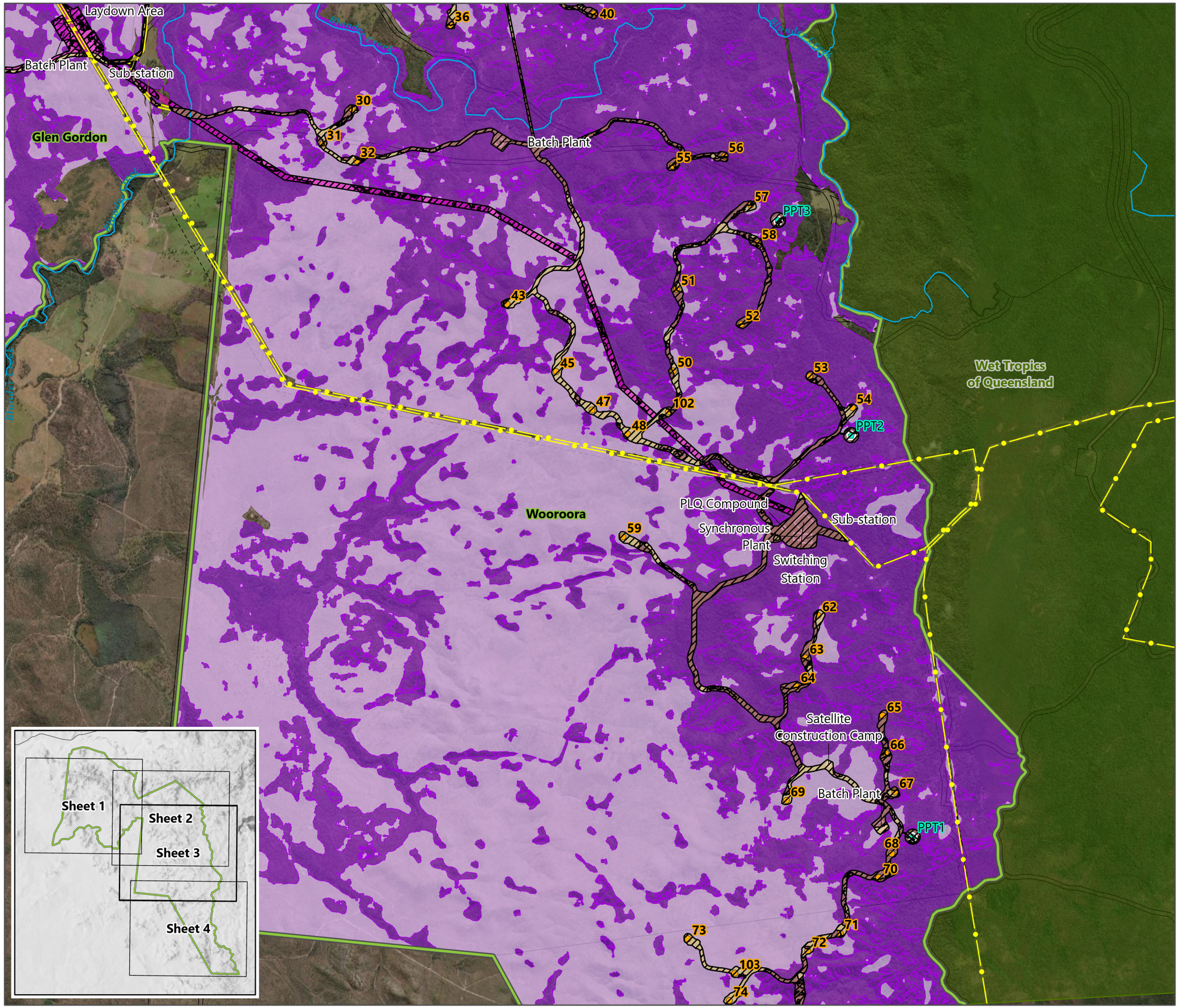


ARK ENERGY

Attexo

Chalumbin Wind Farm

Impacts to Masked owl habitat
Sheet 3 of 4

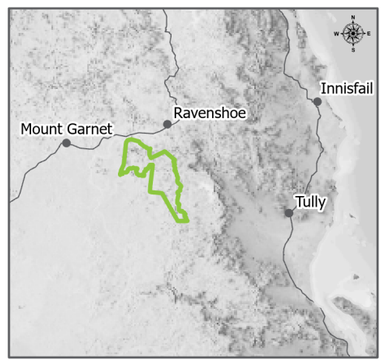
Figure 8.2

- Project Area Boundary
- Turbine
- Met-mast
- Facilities

Clearance Envelope

- Stage 1
- Stage 2
- Significant Residual Impact
- Nesting Habitat
- Foraging Habitat
- Existing HV Transmission Line
- Watercourse
- WTQ Boundary
- Lot Boundary
- Easement

Date: 10/10/2022 Author: TOD
Project: EPU-004 Reviewed: NOD



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Scale: 1:50,000@A3

Data Source(s):
Digital Cadastral Database - Department of Resources (2022)
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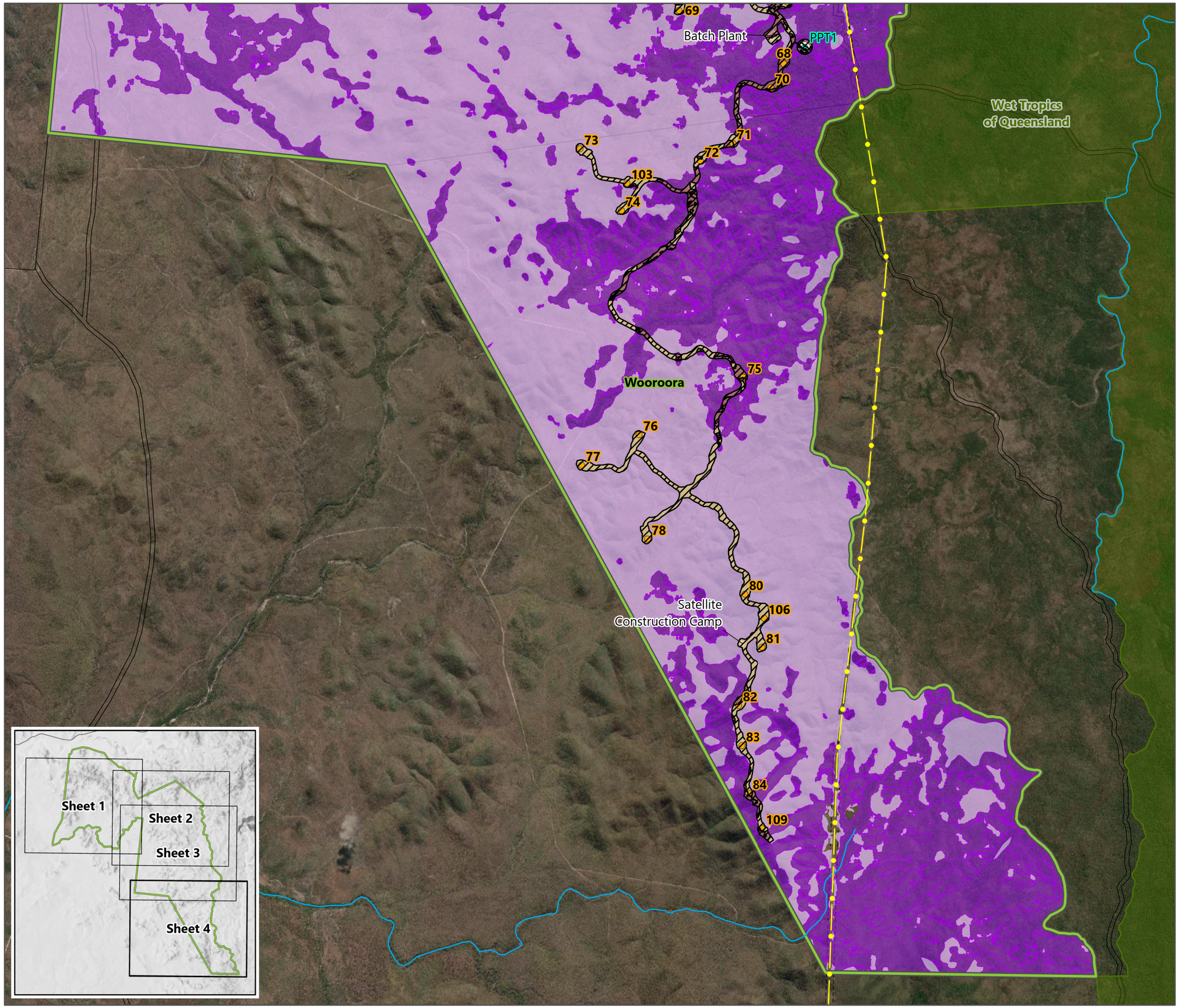

ARK ENERGY

Attexo

Chalumbin Wind Farm

Impacts to Masked owl habitat

Sheet 4 of 4

Figure 8.2

- Project Area Boundary
- Turbine
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Clearance Envelope

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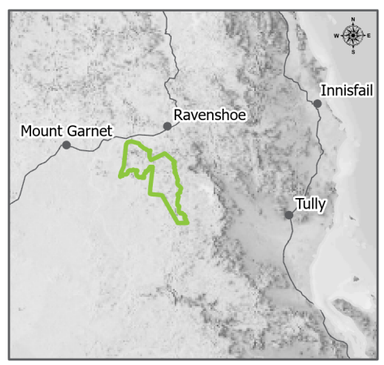
Project: EPU-004 Reviewed: NOD



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Data Source(s):

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8.5.2.2 Potential Operational Impacts from the Project and Relevant Mitigation

Potential operational impacts and proposed mitigation measures for the masked owl are discussed in **Table 8-34**.

Table 8-34 Potential Operational Impacts and Proposed Mitigation – Masked owl

Potential Impact	Assessment	Proposed Mitigation
Species mortality (collision with turbines)	The species hunts within the canopy, taking small mammals – typically gliding from perches in trees to prey (Bruce and Marks 2020). This flight behaviour makes it unlikely it flies at RSA height.	A preliminary Bird and Bat Management Plan (BBMP) has been developed (see **Appendix G**) based on the five seasonal bird utilisation surveys (BUS) undertaken to date. This preliminary BBMP presents the results of a risk assessment, describes the operational monitoring for the site utilisation of birds and bats (compared to baseline data) and protocols for carcass searches to enable detection of any mortality. Triggers for adaptive management are also included. Additional seasonal BUS are planned and the BBMP will be updated as necessary prior to the wind farm being commissioned
Bushfire risk	During operational activities, there is potential for heightened fire risk due to the increased presence of maintenance and monitoring vehicles and personnel in the Project area. This is through the use of machinery that may generate sparks, use of flammable liquids and idling vehicles being present in areas of ground vegetation.	A Bushfire Management Plan will be prepared prior to construction and will be implemented during all on-site activities. Fuel loads will be monitored and managed through activities such as controlled grazing, cool mosaic burns and weed management.
Noise and lighting	There is limited scope for indirect impacts such as noise and lighting on this species resulting from Project operation.	Noise-generating activities during the operations phase will be negligible. Night lighting during the operations phase will be limited to that required for safety and security. Low luminance, directional lighting will be used in proximity to environmentally sensitive areas.
Weed and pest incursion	The Project has the potential to facilitate the spread of weeds and pest fauna through machinery, vehicles and materials brought to site from outside the Project area.	The Project area is currently subjected to existing weed and pest impacts. During operation of the Project, weed and pest control measures will be established to minimise the risk of the Project further exacerbating the issue.

8.5.2.3 Assessment of Significant Residual Impacts

The Project could potentially have a significant residual impact on the masked owl (Vulnerable). A full significance assessment following the Significant Impact Guidelines (DoE 2013) is presented in **Table 8-35**.

Table 8-35 Significant Residual Impact Assessment – Masked owl

Significant Impact Criteria	Assessment
Lead to a long-term decrease in the size of an important population of a species	**Unlikely** Given the Project area's location on the edge of the known distribution of the Wet Tropics subpopulation of this species, the population within and around the Project area is likely to be considered an important population. The Project will involve the clearing of up to 529.5 ha of nesting habitat for the species and 496.8 ha of foraging habitat. Vegetation clearing will be undertaken in accordance with an approved Species Management Plan and any unavoidable impacts on hollow-bearing trees will be mitigated through replacement of hollows/nest boxes on a 1:1 basis. The majority of the cleared area (up to 80 %) will be progressively rehabilitated as soon as possible on completion of construction. Taking into account the avoidance, minimisation and mitigation measures proposed, and the fact that extensive areas of habitat will be retained throughout the Project area, it is considered unlikely that the Project will lead to a long-term decrease in the size of an important population of the masked owl. Furthermore, operational impacts on the species associated with the Project are expected to be unlikely. The masked owl is highly unlikely to fly within the RSA height of the operational wind turbines.
Reduce the area of occupancy of an important population	**Unlikely** Given the Project area's location on the edge of the known distribution of the Wet Tropics subpopulation of this species, the population within and around the Project area is likely to be considered an important population. The Project will involve the clearing of up to 529.5 ha of nesting habitat for the species and 496.8 ha of foraging habitat. This is approximately 3.4 % of the habitat available to the species within the Project area and 1.1 % of the habitat available within the broader Study area. The Project is unlikely to cause a permanent disappearance of the species from a 4 km^2 area such that there would be a decrease in the area of occupancy of the species.
Fragment an existing important population into two or more populations	**Unlikely** Given the Project area's location on the edge of the known distribution of the Wet Tropics subpopulation of this species, the population within and around the Project area is likely to be considered an important population.

Significant Impact Criteria	Assessment
	Vegetation clearing widths required to install the access roads for the Project will be determined by the topography and underlying geology, still to be determined through detailed geotechnical investigations. Conservatively, the maximum clearing distance proposed for the access roads is approximately 70 m to incorporate the required slopes and batters. However, many of the access roads will require much less clearing than this. As soon as practicable after construction, access roads will be revegetated by up to 80 %, leaving only the width required for the permanent access road, approximately 5.5 m. The revegetation will include the use of tree species reflective of the pre-clearing vegetation community. The revegetation will also involve the retention of hollow-bearing trunks from cleared trees, installed at a similar height and aspect adjacent to the Project footprint. Taking into account the avoidance, minimisation and mitigation measures proposed, and the fact that extensive areas of critical and potential habitat will be retained throughout the Project area, it is considered unlikely that the Project will fragment an existing important population of the masked owl into two or more populations.
Adversely affect habitat critical to the survival of a species	**Likely** The Project will involve the removal of 1,026.3 ha of habitat for the masked owl. This clearing represents approximately 3.4% of the habitat for the species mapped within the Project area.
Disrupt the breeding cycle of an important population	**Unlikely** Given the Project area's location on the edge of the known distribution of the Wet Tropics subpopulation of this species, the population within and around the Project area is likely to be considered an important population. Should a pre-clearance survey identify that a masked owl is nesting within the Project footprint, all efforts will be made to microsite the infrastructure to avoid the impact. Occupied nests will not be disturbed, and a buffer of existing vegetation will be retained around the nest, until the chicks have fledged. Vegetation clearing will be undertaken in accordance with an approved Species Management Plan and any unavoidable impacts on hollow-bearing trees will mitigated through replacement of hollows/nest boxes on a 1:1 basis. Taking into account the avoidance, minimisation and mitigation measures proposed, it is not considered likely that the Project will disrupt the breeding cycle of an important population of the masked owl.
Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	**Unlikely** The Project will involve the clearing of up to 529.5 ha of nesting habitat for the species and 496.8 ha of foraging habitat. Vegetation clearing will be undertaken in accordance with an approved Species Management Plan and any unavoidable impacts on hollow-

Significant Impact Criteria	Assessment
	bearing trees will mitigated through replacement of hollows/nest boxes on a 1:1 basis. The majority of the cleared area (up to 80 %) will be progressively rehabilitated as soon as possible on completion of construction. Taking into account the avoidance, minimisation and mitigation measures proposed, and the fact that extensive areas of critical and potential habitat will be retained throughout the Project area, it is considered unlikely that the Project will modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the masked owl is likely to decline.
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	**Unlikely** Clearing activities associated with the Project have the potential to open up areas that may be subject to weed incursion and increased prevalence of pest fauna. Areas of retained vegetation will be managed, including weed and pest animal control to maintain the retained areas in good condition and reduce threats. Hygiene protocols in the operational areas will also be implemented to reduce any weeds or disease being introduced to the Project area or spread from the Project area. Based on implementing the proposed mitigation measures it is not expected the Project will result in an increase of invasive species in the masked owl habitat.
Introduce disease that may cause the species to decline	**Unlikely** The masked owl is not known to be susceptible to any specific diseases. It is not expected that the Project will introduce disease that may cause the species to decline.
Interfere substantially with the recovery of the species	**Unlikely** The Project is not expected to interfere substantially with the recovery of the species. Clearing of habitat will be undertaken sequentially, and large areas of habitat will be retained across the Project area. This availability and connectivity of foraging and breeding habitat will ensure any masked owls within the Project area will have available foraging and breeding resources. Fire will also be managed on site to ensure hot wildfires are minimised and hollow-bearing trees protected. Large tracts of habitat will remain within the Project area which are connected to larger habitats in adjacent areas. These retained and adjacent habitats, particularly along riparian corridors, will support the species into the future. From an operational perspective, the Project poses minimal overall risk to the masked owl.

8.5.3 Red Goshawk

As discussed in **Section 4.6.3**, there is no evidence of any red goshawk breeding pairs nesting within the Project area in the current nesting season and no evidence of any red goshawks currently using any part of the Project area for foraging. The potential for juvenile red goshawks to use the Project area for foraging whilst undertaking the vast migrations for which they are known cannot be discounted.

As the species has not been recorded from within the Project area (nor within the broader Study area for approximately 15 years), no habitat critical to the survival of the species has been mapped within the Project area. Potential nesting habitat within the Project area has been mapped as remnant vegetation up to 1 km from a watercourse (stream order 3 or greater) and with a canopy height greater than 20 m. Potential foraging habitat within the Project area and the broader Study area (for which canopy height data is not available) has been mapped as any other remnant or regrowth vegetation that is not rainforest.

8.5.3.1 Potential Construction Impacts from the Project and Relevant Mitigation

Approximately 7,501 ha of potential nesting habitat for the red goshawk occurs within the Project area, and approximately 52,774 ha occurs within the broader Study area. Approximately 22,819 ha of potential foraging habitat for the red goshawk occurs within the Project area, and approximately 67,946 ha occurs within the broader Study area.

The Project will require clearing of 245.8 ha of potential nesting habitat and 785.9 ha of potential foraging habitat for the red goshawk. Potential construction impacts and proposed mitigation measures for red goshawk are discussed further in **Table 8-36**.

Table 8-36 Potential Construction Impacts and Relevant Mitigation – Red Goshawk

Potential Impact	Assessment	Proposed Mitigation
Vegetation and habitat clearance	The Project will not result in the loss of any habitat critical to the survival of the species, but will lead to the clearing of 245.8 ha of potential nesting habitat and 785.9 ha of potential foraging habitat.	Large areas of potential nesting and foraging habitat for red goshawk will be retained throughout the Project area. The Project design has sought to avoid and minimise clearing within the riparian locations and areas of larger trees which are more likely to be suitable for nesting. If practical during construction, micrositing of access tracks will seek to avoid large nesting trees. Project infrastructure including laydown areas, construction compounds and substation have been sited in cleared areas where practicable to avoid clearing of potential habitat. Clearing of red goshawk habitat will occur sequentially and in accordance with an approved Species Management Program. Impacts to potential nesting habitat are generally restricted to access track and overhead transmission line crossings of riparian environments; the turbines and hardstands are

Potential Impact	Assessment	Proposed Mitigation
		located primarily on elevated ridgelines where there is less suitable habitat for the species.
Habitat fragmentation	The Project will lead to the clearing of 245.8 ha of potential nesting habitat and 785.9 ha of potential foraging habitat for the red goshawk, resulting in fragmentation.	Existing access tracks within the Project area were prioritised as part of the design to minimise any further clearing and fragmentation of vegetation communities. Vegetation clearing will be minimised as much as practicable through micrositing within the proposed Project footprint. Areas cleared for construction that are not required for the operational footprint will be sequentially rehabilitated as soon as practicable following construction.
Weed and pest incursion	The Project has the potential to facilitate the spread of weeds and pest fauna through machinery, vehicles and materials brought to site from outside the Project area.	The Project area is currently subjected to existing weed and pest impacts. During construction of the Project, weed and pest control measures will be established to minimise the risk of the Project further exacerbating the issue. A preliminary Weed and Pest Management Plan has been prepared (see **Appendix F**) and includes management of weed spread (with specific advice for key identified species), management of pest infestations and monitoring effectiveness of control measures. This plan will be further developed by the Construction Contractor prior to works commencing on site
Species mortality (vehicle collision, vegetation clearance)	During vegetation clearing, there is potential for direct mortality if red goshawk are present (i.e. nesting in a tree which is to be cleared). The risk of vehicle strike is negligible.	Clearing of habitat could potentially result in significant injury or death to individual red goshawks. A pre-construction survey will confirm whether there are any red goshawk nests within the clearing footprint prior to construction. If potential nests are identified, clearing of the nest tree and a 300m buffer around it will be postponed until after the nesting season when any chicks have fledged. In the absence of any potential nests within the clearing footprint, clearing operations will be conducted in accordance with the provisions outlined in a sequential clearing procedure including the use of a fauna spotter catcher and retention of potential nest trees overnight. The process will significantly mitigate any potential impacts associated with clearing operations ensuring red goshawk are detected, provided procedures are

Potential Impact	Assessment	Proposed Mitigation
		followed and spotters are allowed ample opportunity to check trees before felling. If the Project does result in death to individual red goshawks or the loss of any confirmed nests, offsets may be required.
Erosion and sedimentation	The red goshawk is unlikely to be directly impacted by erosion and reduced water quality resulting from Project construction.	A preliminary Erosion and Sediment Control Plan (ESCP) (**Appendix I**) and a Sediment and Erosion Management Plan (**Appendix J**) have been prepared for the Project and will be further developed by the Construction Contractor prior to works commencing on site. Implementation of these plans will minimise soil loss from the disturbance areas.
Bushfire risk	Inappropriate fire regimes may be a threat to this species. The Project is not expected to increase the risk of high intensity bushfires in the Project area.	A Bushfire Management Plan will be prepared prior to construction and will be implemented during all on-site activities. Fuel loads will be monitored and managed through activities such as controlled grazing, cool mosaic burns and weed management
Noise and lighting	There is limited scope for impacts such as noise and lighting on this species resulting from Project construction.	Standard construction work hours will generally be between 6.30am and 6.30pm, therefore site lighting will be kept to the minimum required for safety. Where necessary, construction lighting will be directed to the required areas and designed to minimise light spill to adjacent areas. Construction equipment will be fitted with noise reduction devices where practicable and switched off when not in use
Dust emissions	There is limited scope for indirect impacts from dust emissions on this species resulting from Project construction.	Generally, dust is not expected to pose a significant risk in this high-rainfall area. Dust generating activities will be minimised during dry, windy conditions and areas of exposed soils will be rehabilitated as soon as practicable, to minimise dust emissions. Dust suppression (water spraying) will be used during the dry season as necessary

8.5.3.2 Potential Operational Impacts from the Project and Relevant Mitigation

Potential operational impacts and proposed mitigation measures for the red goshawk are discussed in **Table 8-37**.

Table 8-37 Potential Operational Impacts and Relevant Mitigation–- Red Goshawk

Potential Impact	Assessment	Mitigation
Species mortality (collision with turbines)	The species hunts primarily within or just under the canopy, taking small to medium-sized birds. This foraging behaviour means the red goshawk does not fly within RSA height most of the time. However, it is known to soar occasionally, particularly during breeding displays.	A preliminary Bird and Bat Management Plan (BBMP) has been developed (see **Appendix G**) based on the three seasonal bird utilisation surveys (BUS) undertaken to take. This preliminary BBMP presents the results of a risk assessment, describes the operational monitoring for the site utilisation of birds and bats (compared to baseline data) and protocols for carcass searches to enable detection of any mortality. Triggers for adaptive management are also included. Additional seasonal BUS are planned and the BBMP will be updated as necessary prior to the wind farm being commissioned. If the Project does result in death to individual red goshawks due to collision with a turbine during operation, offsets may be required. In accordance with the EPBC Act, these may take the form of payment into a fund to support research on the species.
Bushfire risk	The increased presence of construction personnel, vehicles and machinery in the Project area during operational activities may lead to elevated bushfire risk unless adequately mitigated.	A Bushfire Management Plan will be prepared prior to construction and will be implemented during all on-site activities. Fuel loads will be monitored and managed through activities such as controlled grazing, cool mosaic burns and weed management.
Noise and lighting	There is limited scope for indirect impacts such as noise and lighting on this species resulting from Project operation.	Noise-generating activities during the operations phase will be negligible. Night lighting during the operations phase will be limited to that required for safety and security. Low luminance, directional lighting will be used in proximity to environmentally sensitive areas.
Weed and pest incursion	The Project has the potential to facilitate the spread of weeds and pest fauna through machinery,	The Project area is currently subjected to existing weed and pest impacts. During operation of the Project, weed

Potential Impact	Assessment	Mitigation
	vehicles and materials brought to site from outside the Project area.	and pest control measures will be established to minimise the risk of the Project further exacerbating the issue.

8.5.3.3 Assessment of Significant Residual Impacts

The Project is assessed as being unlikely to have a significant residual impact on the red goshawk (Vulnerable). A full significance assessment following the Significant Impact Guidelines (DoE 2013) is presented in **Table 8-38**.

Table 8-38 Significant Residual Impacts – Red Goshawk

Significant Impact Criteria	Project Outcome
Lead to a long-term decrease in the size of an important population of a species	**Unlikely** The red goshawk has not been definitively recorded within the Project area, despite a full year's worth of bird surveys and targeted surveys for potential red goshawk nests during the nesting season. The Project area may periodically support foraging juvenile red goshawks during their long migrations, but this would not be considered to represent an important population. The Project will involve the clearing of up to 245.8 ha of potential nesting habitat and 785.9 ha of potential foraging habitat for the species. The Project design has sought to avoid and minimise impacts within areas of potential nesting habitat to the greatest extent practicable. Vegetation clearing will be undertaken in accordance with an approved Species Management Plan; any unavoidable clearing of potential nest trees will be undertaken outside the nesting season and after any chicks have fledged. Taking into account the avoidance, minimisation and mitigation measures proposed, and the fact that extensive areas of potential nesting and foraging habitat will be retained throughout the Project area, it is considered unlikely that the Project will lead to a long-term decrease in the size of an important population of the red goshawk. Furthermore, operational impacts on the species associated with the Project are not anticipated. The red goshawk is known to forage primarily within or just under the canopy and is only likely to soar to within the RSA height of the operational wind turbines during breeding displays.
Reduce the area of occupancy of an important population	**Unlikely** The red goshawk has not been definitively recorded within the Project area, despite a full year's worth of bird surveys and targeted surveys for potential red goshawk nests during the nesting season. The Project area may periodically support foraging juvenile red goshawks during their

Significant Impact Criteria	Project Outcome
	long migrations, but this would not be considered to represent an important population. The Project will involve the clearing of up to 245.8 ha of potential nesting habitat and 785.9 ha of potential foraging habitat for the species. The Project design has sought to avoid and minimise impacts within areas of potential nesting habitat to the greatest extent practicable. The Project is unlikely to cause a permanent disappearance of the species from a 4 km^2 area such that there would be a decrease in the area of occupancy of the species.
Fragment an existing important population into two or more populations	**Unlikely** The red goshawk has not been definitively recorded within the Project area, despite a full year's worth of bird surveys and targeted surveys for potential red goshawk nests during the nesting season. The Project area may periodically support foraging juvenile red goshawks during their long migrations, but this would not be considered to represent an important population. The Project will involve the clearing of up to 245.8 ha of potential nesting habitat and 785.9 ha of potential foraging habitat for the species. The Project design has sought to avoid and minimise impacts within areas of potential nesting habitat to the greatest extent practicable. Vegetation clearing will be undertaken in accordance with an approved Species Management Plan and any unavoidable clearing of potential nest trees will be undertaken outside the nesting season and after any chicks have fledged. Taking into account the avoidance, minimisation and mitigation measures proposed, and the fact that extensive areas of critical and potential habitat will be retained throughout the Project area, it is considered unlikely that the Project will fragment an existing important population of the red goshawk into two or more populations.
Adversely affect habitat critical to the survival of a species	**Unlikely** The red goshawk has not been definitively recorded within the Project area, despite a full year's worth of bird surveys and targeted surveys for potential red goshawk nests during the nesting season. The Project area is therefore not considered to provide critical habitat for the species. The Project will not result in the clearing of any critical habitat for the red goshawk.
Disrupt the breeding cycle of an important population	**Unlikely** No evidence has been recorded of red goshawks nesting within the Project area, despite targeted surveys. The Project area is not considered to support an important population of red goshawk, nor does it provide critical habitat for the species. Breeding generally occurs in spring and chicks have typically fully fledged by the end of the year. As a precautionary measure,

Significant Impact Criteria	Project Outcome
	construction works within potential nesting habitat will be undertaken outside these months. Should a pre-clearance survey identify that a red goshawk is nesting within the Project footprint, clearing of the nest tree and a 300m buffer around it will be postponed until after the nesting season when any chicks have fledged. Offsets may be required for any loss of confirmed red goshawk nests. Vegetation clearing will be undertaken in accordance with an approved Species Management Plan. Taking into account the avoidance, minimisation and mitigation measures proposed, it is not considered likely that the Project will disrupt the breeding cycle of an important population of the red goshawk.
Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	**Unlikely** The red goshawk has not been definitively recorded within the Project area, despite a full year's worth of bird surveys and targeted surveys for potential red goshawk nests during the nesting season. The Project area may periodically support foraging juvenile red goshawks during their long migrations, but this would not be considered to represent an important population. The Project will involve the clearing of up to 245.8 ha of potential nesting habitat and 785.9 ha of potential foraging habitat for the species. The Project design has sought to avoid and minimise impacts within these areas to the greatest extent practicable. Vegetation clearing will be undertaken in accordance with an approved Species Management Plan. Taking into account the avoidance, minimisation and mitigation measures proposed, and the fact that extensive areas of potential nesting and foraging habitat will be retained throughout the Project area, it is considered unlikely that the Project will modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the red goshawk is likely to decline.
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	**Unlikely** Clearing activities associated with the Project have the potential to open up areas that may be subject to weed incursion and increased prevalence of pest fauna. Areas of retained vegetation will be managed, including weed and pest animal control to maintain the retained areas in good condition and reduce threats. Hygiene protocols in the operational areas will also be implemented to reduce any weeds or disease being introduced to the Project area or spread from the Project area. Based on implementing the proposed mitigation measures it is not expected the Project will result in an increase of invasive species in the red goshawk habitat.
Introduce disease that may cause the species to decline	**Unlikely**

Significant Impact Criteria	Project Outcome
	No specific disease is applicable to the red goshawk. It is not expected that the Project will introduce disease that may cause the species to decline.
Interfere substantially with the recovery of the species	**Unlikely** The Project is not expected to interfere substantially with the recovery of the species. Clearing of habitat will be undertaken sequentially, and large areas of potential nesting and foraging habitat will be retained across the Project area. This availability and connectivity of foraging and breeding habitat will ensure any red goshawk within the Project area will have available foraging and breeding resources. Fire will also be managed on site to ensure hot wildfires are minimised and hollow-bearing trees protected. Large tracts of habitat will remain within the Project area which are connected to larger habitats in adjacent areas. These retained and adjacent habitats, particularly along riparian corridors, will support the species into the future. From an operational perspective, the Project poses minimal overall risk to the red goshawk due to its tendency to forage within or just below the canopy.

8.5.4 Southern Cassowary – Southern Population

As discussed in **Section 4.6.4**, no evidence of southern cassowary has been observed within the Project area during field surveys. Habitat critical to the survival of the species has been mapped as scattered, isolated patches of RE types that are listed as Essential Habitat in the Recovery Plan for Southern Cassowary (Latch 2007) where these occur within 1.5 km of a water source (which cassowaries require access to throughout the day)

8.5.4.1 Potential Construction Impacts from the Project and Relevant Mitigation

Approximately 218 ha of critical habitat for the southern cassowary (southern population) occurs within the Project area, and approximately 29,114 ha occurs within the broader Study area. The Project has been designed to avoid clearing any habitat critical to the survival of the southern cassowary.

Potential construction impacts and proposed mitigation measures for southern cassowary are discussed further in **Table 8-39**.

Table 8-39 Potential Construction Impacts and Relevant Mitigation – Southern Cassowary

Potential Impact	Assessment	Mitigation
Vegetation and habitat clearance	The Project will not clear critical or potential habitat for the southern cassowary.	The Project footprint has been specifically designed to avoid all critical and potential habitat for this species.

Potential Impact	Assessment	Mitigation
Fragmentation (of populations and habitat)	The Project will not clear critical or potential habitat for the southern cassowary.	The Project footprint has been specifically designed to avoid all critical and potential habitat for this species. Retained vegetation will be maintained through implementation of a Vegetation Management Plan to reduce hazards from fire, pest species, degradation and other potential impacts. This will assist in maintaining the integrity of the vegetation as habitat and will reduce disturbance to surrounding habitat and conservation areas. Areas cleared for construction that are not required for the operational footprint will be sequentially rehabilitated as soon as practicable following construction.
Weed and pest incursion	The Project area is currently subjected to existing weed and pest impacts, including feral pigs and a large population of wild dogs. The Project has the potential to facilitate the spread of weeds and pest fauna through machinery, vehicles and materials brought to site from outside the Project area.	During construction of the Project, weed and pest control measures will be established to minimise the risk of the Project further exacerbating the issue. A preliminary Weed and Pest Management Plan has been prepared (see **Appendix F**) and includes management of weed spread (with specific advice for key identified species), management of pest infestations and monitoring effectiveness of control measures. This plan will be further developed by the Construction Contractor prior to works commencing on site.
Species mortality (vehicle collision, vegetation clearance)	The risk of vehicle strike on southern cassowary during construction (including vegetation clearing and general vehicle movements) is unlikely given the habitat with the Project Area is avoided.	No evidence of southern cassowary has been observed within the Project area during field surveys and it is probable that the species uses the Project area sporadically, at most. Clearing of vegetation could potentially result in significant injury or death to individual southern cassowary if present, however clearing operations will be conducted in accordance with the provisions outlined in a sequential clearing procedure including the use of a fauna spotter catcher and retention of any potential nesting habitat overnight. The process will significantly mitigate any potential impacts associated with clearing operations ensuring southern cassowary are detected, provided procedures are followed and spotters are allowed ample opportunity to check areas prior to construction. Any potential nest sites will be marked and inspected where possible

Potential Impact	Assessment	Mitigation
		for the presence of fauna prior to clearing. Clearing protocols will be developed including checks for any injured species, which would be taken to a vet for treatment. Construction personnel will be educated on the potential presence of southern cassowary. Off-track driving will not be permitted and reduced speed limits will be enforced in proximity to areas of southern cassowary habitat, with appropriate signage on site.
Erosion and sedimentation	Construction activities may alter surface water overland flow, leading to increased erosion of suitable habitat. The southern cassowary requires access to fresh water for drinking and bathing throughout the day, and could be impacted by reduced water quality in creeks.	A preliminary Erosion and Sediment Control Plan (ESCP) (**Appendix I**) and a Sediment and Erosion Management Plan (**Appendix J**) have been prepared for the Project and will be further developed by the Construction Contractor prior to works commencing on site. Implementation of these plans will minimise soil loss from the disturbance areas.
Indirect impacts such as smothering by dust and accidental release of hazardous materials such as fuel	Construction activities have the potential to result in indirect impacts on vegetation (including cassowary food sources) if not undertaken in accordance with the Construction EMP and associated sub-plans.	Smothering of vegetation by dust is not expected to pose a significant risk in this high-rainfall area. Dust generating activities will be minimised during dry, windy conditions and areas of exposed soils will be rehabilitated as soon as practicable, to minimise dust emissions. Dust suppression (water spraying) will be used during the dry season as necessary, including in areas of sensitive vegetation adjacent to the construction footprint if visible dust is observed. Accidental releases of hazardous materials in proximity to southern cassowary habitat is highly unlikely as these materials would be securely stored in dedicated areas within the construction compound, away from sensitive sites. Spills would be limited to small drips from machinery hoses and similar, and would be cleaned up immediately, with the waste disposed of in accordance with the Construction EMP.
Noise and vibration	Noise emissions may cause general disturbance to southern cassowary, particularly at night when the species requires a quiet place to rest.	Standard construction work hours will generally be between 6.30am and 6.30pm, therefore noise will be kept to the minimum at night. Construction equipment will be fitted with noise reduction devices where practicable and switched off when not in use.

Potential Impact	Assessment	Mitigation
Light emissions	The southern cassowary is mostly active during the day and requires a dark place to rest at night. There is a risk that the southern cassowary may be disturbed by light emissions associated with the Project.	Standard construction work hours will generally be between 6.30am and 6.30pm, therefore site lighting will be kept to the minimum required for safety. Where necessary, construction lighting will be directed to the required areas and designed to minimise light spill to adjacent areas.
Bushfire risk	Inappropriate fire regimes are a threat to this species. The Project is not expected to increase the risk of high intensity bushfires in the Project area.	A Bushfire Management Plan will be prepared prior to construction and will be implemented during all on-site activities. Fuel loads will be monitored and managed through activities such as controlled grazing, cool mosaic burns and weed management.

8.5.4.2 Potential Operational Impacts from the Project and Relevant Mitigation

Potential operational impacts and proposed mitigation measures for the southern cassowary are discussed in **Table 8-40.**

Table 8-40 Potential Operational Impacts and Relevant Mitigation – Southern Cassowary

Potential Impact	Assessment	Mitigation
Collision risk / vehicle strike	The southern cassowary is a flightless bird and not at risk of collision with the wind turbines. The potential for species mortality associated with vehicle strike during operation of the Project is low.	Access roads within the Project area will be speed restricted, with signage placed at key locations. All operational traffic will be confined to designated access roads. Appropriate procedures for managing injured wildlife will be developed and implemented through the Operations EMP.
Bushfire risk	During operational activities, there is potential for heightened fire risk due to the increased presence of maintenance and monitoring vehicles and personnel in the Project area. This is through the use of machinery that may generate sparks, use of flammable liquids and idling vehicles being present in areas of ground vegetation.	A certified Bushfire Management Plan will be prepared prior to construction and will be implemented during all on-site activities. Fuel loads will be monitored and managed through activities such as controlled grazing, cool mosaic burns and weed management.
Weed and pest incursion	Weeds (such as pond apple) and pest fauna (such as dogs) are both known threats of the southern cassowary. The Project area is currently subjected to existing weed and pest impacts, including an established wild dog population The	During operation of the Project, weed and pest control measures will be established to minimise the risk of the Project further exacerbating the issue.

Potential Impact	Assessment	Mitigation
	Project has the potential to facilitate the spread of weeds and pest fauna through machinery, vehicles and materials brought to site from outside the Project area.	Specifically, wild dog control will be undertaken – this will assist to reduce predation on southern cassowary.
Noise and lighting	There is limited scope for indirect impacts such as noise and lighting on this species resulting from Project operation.	Noise-generating activities during the operations phase will be negligible. Night lighting during the operations phase will be limited to that required for safety and security. Low luminance, directional lighting will be used in proximity to environmentally sensitive areas.

8.5.4.3 Assessment of Significant Residual Impacts

The Project is assessed as unlikely to have a significant residual impact on the southern cassowary. A full significance assessment following the Significant Impact Guidelines for the endangered southern cassowary (*Casuarius casuarius johnsonii*) Wet Tropics Population (DEWHA 2010d) is presented in **Table 8-41**.

Table 8-41 Significant Residual Impact – Southern Cassowary

Threat	For actions within potential cassowary habitat, plus a 100 m buffer	Watercourses within, adjacent to or linking areas of potential cassowary habitat, plus a 50 m buffer from the bank
Habitat removal	Clearing > 1,500 m^2 for any purpose other than a single dwelling on an existing lot. Forestry operations (including selecting logging) that open the canopy by > 10% or remove cassowary food trees. Subdivision of land that results in clearing and/or intensification of use.	Any clearing.
Project outcome	*The Project will not result in the removal of any critical or potential habitat for the cassowary. There will be clearing of approximately 3.41 ha of vegetation within a 100 m buffer of mapped critical habitat, relating to a small patch of critical habitat that is isolated from the next fragment of critical habitat by 1.1 km. More expansive areas of critical habitat are*	*The Project will not result in the removal of watercourse habitat adjacent to or linking areas of cassowary habitat.*

Threat	For actions within potential cassowary habitat, plus a 100 m buffer	Watercourses within, adjacent to or linking areas of potential cassowary habitat, plus a 50 m buffer from the bank
	approximately 2.5 km to the east, within the WTQWHA.	
Habitat degradation caused by exotic plants or animals; increased accessibility; fire behaviour change; microclimate change	Any action that reduces habitat quality.	Any action that changes water quality or flow.
Project outcome	*Mitigation measures outlined in* ***Section 6.0*** *are considered appropriate to manage this risk.*	*The Project will not result in any impacts to watercourse habitat adjacent to or linking areas of cassowary habitat.*
Fragmentation and isolation of habitat and populations caused by roads; fencing; drainage channels; powerlines; service infrastructure and subdivision of land	Any action that reduces patch area to < 5 ha; separates patches by > 100 m; reduces patch quality; or separates or perforates existing patches.	Any action that reduces access to water (for example fencing that reduces connectivity within or between riparian corridors, and roads that reduce connectivity between or within riparian corridors); or any action that reduces movement along waterways.
Project outcome	*The Project will not result in the removal of critical or potential habitat for the cassowary. Furthermore, the Project will not separate patches of habitat by > 100 m or perforate existing patches.*	*The Project will not result in any impacts to watercourse habitat adjacent to or linking areas of cassowary habitat.*
Roads and traffic: Traffic conflict points Traffic volume such as road upgrades or traffic-producing development Any increase in vehicle speed limits Proliferation of roadside weeds Any road or vehicle track developments with proposed speeds > 60 km/hr (without adequate and proven traffic calming measures) in places where cassowary road deaths have occurred; through known cassowary crossing points; within local or regional movement corridors; in the eight key areas where the cassowary is seriously	Any action that increases traffic conflict; traffic volume; or traffic speed to > 60 km/hr.	Any road, trail or other access point, construction or upgrade.

Threat	For actions within potential cassowary habitat, plus a 100 m buffer	Watercourses within, adjacent to or linking areas of potential cassowary habitat, plus a 50 m buffer from the bank
threatened; or through National Parks or conservation areas.		
Project outcome	*The Project area supports minimal areas of critical and potential habitat for southern cassowary, and none of these areas will be intersected by Project access roads. One isolated patch of critical habitat will be separated from larger areas of cassowary habitat by a Project access road; vehicle speed limits will be signposted for this road and warning signs will be installed. Specific training on the risk of encountering cassowaries will be provided to all construction staff. Operational traffic movements will be limited in number.*	*The Project will not result in any impacts to watercourse habitat adjacent to or linking areas of cassowary habitat.*

8.5.5 White-throated Needletail

As discussed in **Section 4.6.5**, one white-throated needletail was found deceased within the existing transmission line corridor that crosses the Project area, during the March 2021 field surveys. Five white-throated needletail were observed during the March 2022 field surveys. No habitat mapping has been undertaken for white-throated needletail as this species could occur in any airspace over the Project area.

8.5.5.1 Potential Construction Impacts from the Project and Relevant Mitigation

Potential construction impacts and proposed mitigation measures for the white-throated needletail are discussed in **Table 8-42**.

Table 8-42 Potential Construction Impacts and Proposed Mitigation – White-throated Needletail

Potential Impact	Assessment	Proposed Mitigation
Vegetation and habitat clearance	The species is almost exclusively aerial and direct impacts from clearance of habitat is not expected to occur as a result of the Project. The species forages frequently over all landscapes and the vegetation clearance associated with the Project is not	The mitigation measures outlined in **Section 6.0** are considered appropriate to manage this risk.

Potential Impact	Assessment	Proposed Mitigation
	expected to impact foraging resources.	
Fragmentation (of populations and habitat)	As white-throated needletails are almost exclusively aerial, direct impacts from fragmentation of their habitat are not expected to occur as a result of Project construction.	The mitigation measures outlined in **Section 6.0** are considered appropriate to manage this risk.
Weed and pest incursion	There is limited scope for indirect impacts such as weed and pest interaction with this species resulting from Project construction. Although there is the possibility of roosting individuals being taken by cats, the frequency of such events is likely to be extremely low. The potential for weeds to impact on the quality of foraging habitat is low.	The mitigation measures outlined in **Section 6.0** are considered appropriate to manage this risk
Species mortality (vehicle collision, vegetation clearance)	These potential impacts are considered to be negligible risks for the white-throated needletail which is almost exclusively aerial.	The mitigation measures outlined in **Section 6.0** are considered appropriate to manage this risk
Erosion and sedimentation	White-throated needletail is unlikely to be directly impacted by impacts from erosion and reduced water quality resulting from Project construction.	The mitigation measures outlined in **Section 6.0** are considered appropriate to manage this risk
Bushfire risk	There is limited scope for impacts such as increased bushfire risk on this species resulting from Project construction.	The mitigation measures outlined in **Section 6.0** are considered appropriate to manage this risk
Noise and lighting	There is limited scope for impacts such as noise and lighting on this species resulting from Project construction.	The mitigation measures outlined in **Section 6.0** are considered appropriate to manage this risk.
Dust emissions	There is limited scope for impacts such as reduced air quality on this species resulting from Project construction.	The mitigation measures outlined in **Section 6.0** are considered appropriate to manage this risk.

8.5.5.2 Potential Operational Impacts from the Project and Relevant Mitigation

Potential operational impacts and proposed mitigation measures for the white-throated needletail are discussed in **Table 8-43**.

Table 8-43 Potential Operational Impacts and Proposed Mitigation – White-throated Needletail

Potential Impact	Assessment	Proposed Mitigation
Species mortality (turbine collision)	During Project operation there is potential for the white-throated needletail to collide with wind turbines and tower structures during the summer months when the species is likely to be present sporadically within the Project area. The impact is expected to be minor as this species uses a range of habitats and is widespread across eastern Australia. Operational monitoring data from 15 wind farms in Victoria between 2003-2018 only recorded five white-throated needletail deaths as a result of turbine strike. This species is not considered to be particularly prone to turbine strike; it is a relatively mobile species and often flies at heights well above RSA. The Conservation Advice for the species (TSSC, 2019) acknowledges collision with wind turbines as a threat, although of low severity and affecting a small number of birds (Hull, 2013). Prior to its recent listing as threatened under the EPBC Act, and following the draft referral guidelines for migratory species under the EPBC Act (DoE, 2015) an ecologically significant proportion of the population of white-throated needletail was estimated to be 10 birds (0.1% of the total population using the lower population estimate of 10,000 birds). To date, only one white-throated needletail has been recorded within the Project area after a full year's worth of seasonal surveys. A review of this significant impact threshold will be made under an adaptive management framework following further information on the species being available in subsequent bird utilisation survey monitoring, and the potential impact from other wind farms becomes available.	A preliminary Bird and Bat Management Plan (BBMP) has been developed (see **Appendix G**) based on the three seasonal bird utilisation surveys (BUS) undertaken to take. This preliminary BBMP presents the results of a risk assessment, describes the operational monitoring for the site utilisation of birds and bats (compared to baseline data) and protocols for carcass searches to enable detection of any mortality. Triggers for adaptive management are also included. Additional seasonal BUS are planned and the BBMP will be updated as necessary prior to the wind farm being commissioned.
Species mortality (vehicle collision)	During operational activities, there is negligible risk of the species colliding with Project vehicles, as the species is almost exclusively aerial.	Access roads within the Project area will be speed restricted, with signage placed at key locations. All

Potential Impact	Assessment	Proposed Mitigation
		operational traffic will be confined to designated access roads. Appropriate procedures for managing injured wildlife will be developed and implemented through the Operations EMP.
Bushfire risk	During operational activities, there is potential for heightened fire risk due to the increased presence of maintenance and monitoring vehicles and personnel in the Project area. This is through the use of machinery that may generate sparks, use of flammable liquids and idling vehicles being present in areas of ground vegetation.	A Bushfire Management Plan will be prepared prior to construction and will be implemented during all on-site activities. Fuel loads will be monitored and managed through activities such as controlled grazing, cool mosaic burns and weed management.
Weed and pest incursion	There is limited scope for indirect impacts such as weed and pest interaction with this species resulting from Project operation. Although there is the possibility of roosting individuals being taken by cats, the frequency of such events is likely to be low. The potential for weeds to impact on the quality of foraging habitat is low.	During operation of the Project, weed and pest control measures will be established and implemented to minimise the risk of the Project further exacerbating this issue.
Noise and lighting	There is limited scope for indirect impacts such as noise and lighting on this species resulting from Project operation. Lighting of turbines during operation may lead to increased insect numbers in the vicinity of turbine structures. This may attract insectivorous species such as the white-throated needletail to the area around structures, increasing collision risk. However, it is exclusively a diurnal species, and therefore the mechanism for increased impacts from lighting impacts is negligible.	Noise-generating activities during the operations phase will be negligible. Night lighting during the operations phase will be limited to that required for safety and security. Low luminance, directional lighting will be used in proximity to environmentally sensitive areas.

8.5.5.3 Assessment of Significant Residual Impacts

The Project is not expected to have a significant residual impact on the white-throated needletail (Vulnerable). A full significance assessment following the Significant Impact Guidelines (DoE 2013) is presented in **Table 8-44**.

Table 8-44 Significant Residual Impact Assessment – White-throated needletail

Significant Impact Criteria	Assessment
Lead to a long-term decrease in the size of an important population of a species	**Unlikely** Important populations of the white-throated needletail have not been specifically nominated. Given the species' capacity for large-scale migration, the species is unlikely to have localised important populations. As the Project area is not near the edges of the species' known range it is unlikely to be an important population. The white-throated needletail is exclusively aerial and does not have typical associations with habitat. As such, clearing for the Project is unlikely to have a significant impact on the species' local abundance. The white-throated needletail has a low risk of collision with wind turbines. Collision mortality of white-throated needletails has been occasionally reported from Australian wind farms where the species occurs. The species typically occurs singly and flies at heights of up to 1,000 m elevation. While individuals can occasionally fly at RSA height, the risks of collision are considered low. While a small number of individuals may collide with wind turbines during the operation phase, the level of mortality is not expected to have any impact at a population level.
Reduce the area of occupancy of an important population	**Unlikely** The Project area is not considered to support an important population of white-throated needletail and the Project will not result in the loss of habitat for the white-throated needletail. While the species could experience some injury and mortality due to collision with wind turbines, this is unlikely to cause a permanent disappearance of the species from a 4 km^2 area such that there would be a decrease in the area of occupancy of the species.
Fragment an existing important population into two or more populations	**Unlikely** The Project area is not considered to support an important population of white-throated needletail and the terrestrial habitats within the Project area are not critical habitat for the white-throated needletail. The species has the capacity to overfly cleared and fragmented areas; it is almost exclusively aerial. Consequently, the Project will not fragment a population of the species into two or more populations.
Adversely affect habitat critical to the survival of a species	**Unlikely** The Project area does not contain habitat critical to the survival of the white-throated needletail, as the species does not have conventional habitat requirements.
Disrupt the breeding cycle of an important population	**Unlikely** The white-throated needletail does not breed in Australia. It spends its breeding season in Asia. Consequently, the Project will not disrupt the breeding cycle of an important population of the species.
Modify, destroy, remove or isolate or decrease the availability or quality of	**Unlikely**

Significant Impact Criteria	Assessment
habitat to the extent that the species is likely to decline	The species is almost entirely aerial and does not have conventional habitat requirements. The Project therefore will not modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	**Unlikely** There are no invasive species identified as threats to the white-throated needletail. The Project is not expected to result in an increase in invasive species that might threaten the local abundance of the white-throated needletail.
Introduce disease that may cause the species to decline	**Unlikely** Disease is not identified as a key threat to the species. The predominantly aerial nature of the species is such that it is unlikely to have many opportunities to contract diseases that could threaten any local populations. Furthermore, the Project is not expected to increase the prevalence of any diseases.
Interfere substantially with the recovery of the species	**Unlikely** Through collision risk, the Project has the potential to cause periodic injury and mortality of white-throated needletails. Based on the sporadic nature of the species' presence within the Project area and based on empirical evidence from operational wind farms in Australia, this is likely to affect small numbers of individuals under normal circumstances. An ecologically significant proportion of the population of the species is estimated to be 10 birds (0.1% of the total population using the lower population estimate of 10,000 birds). The risk of collision mortality is unlikely to be of a sufficient magnitude to interfere with the recovery of the species.
Substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of important habitat for a migratory species	**Unlikely** The species is almost entirely aerial and does not have conventional habitat requirements. The Project therefore will not modify, destroy or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.
Result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species	**Unlikely** There are no invasive species identified as threats to the white-throated needletail. The Project is not expected to result in an increase in invasive species that might threaten the local abundance of the white-throated needletail.
Seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species	**Unlikely** The white-throated needletail does not breed in Australia. It spends its breeding season in Asia. Consequently, the Project will not disrupt the breeding cycle of an important population of the species. Through collision risk, the Project has the potential to cause periodic injury and mortality of white-throated needletails. Based on the sporadic nature of the species' presence within the Project area and based on

Significant Impact Criteria	Assessment
	empirical evidence from operational wind farms in Australia, this is likely to affect small numbers of individuals under normal circumstances. An ecologically significant proportion of the population of the species is estimated to be 10 birds (0.1% of the total population using the lower population estimate of 10,000 birds). The risk of collision mortality is unlikely to be of a sufficient magnitude to interfere with the recovery of the species.

8.6 Listed Threatened Mammals Species

8.6.1 Black-footed Tree-rat

As discussed in **Section 4.7.1.4**, the black-footed tree-rat has not been recorded within the Project area and its presence within the Project area is considered unlikely. Nonetheless, potential habitat has been mapped as riparian forest below 700 m with a 500 m buffer to allow for the species' foraging range.

8.6.1.1 Potential Construction Impacts from the Project and Relevant Mitigation

Approximately 9,782.2 ha of potential habitat for black-footed tree-rat has been mapped within the Project area, and approximately 39,817.2 ha within the broader Study area.

The Project will require clearing of approximately 140.5 ha of potential habitat for black-footed tree-rat during Stage 1 and approximately 58.4 ha during Stage 2 (198.9 ha in total across both Stages). Potential construction impacts and proposed mitigation measures for the black-footed tree-rat are discussed further in **Table 8-45**.

Table 8-45 Potential Construction Impacts and Relevant Mitigation – Black-footed Tree-rat

Potential Impact	Assessment	Mitigation
Vegetation and habitat clearance	The Project will result in clearing of 198.9 ha of potential habitat for the species.	There is no mapped critical habitat within the Project area. Large areas of potential black-footed tree-rat habitat throughout the Project area will be retained. Design has sought to avoid and minimise clearing within mapped areas of potential black-footed tree-rat habitat. If practical during construction, micrositing of access tracks will seek to avoid hollow-bearing trees that could support dens. Vegetation clearing will be minimised as much as practicable through micrositing within the proposed Project footprint. Project infrastructure including laydown areas, construction compounds and substation have been sited in cleared areas where practicable to

Potential Impact	Assessment	Mitigation
		avoid clearing of potential black-footed tree-rat habitat. Existing access tracks within the Project area are prioritised as part of the design to minimise any further clearing and fragmentation of vegetation communities. Clearing of black-footed tree-rat habitat will occur sequentially and in accordance with an approved Species Management Program. Unavoidable impacts to potential den sites will be mitigated through relocation of the den sites (particularly hollow logs and stags) into adjacent undisturbed habitat where practicable under the supervision of an appropriately trained fauna spotter catcher.
Fragmentation (of populations and habitat)	The Project could result in fragmentation through clearing of 198.9 ha of potential habitat for the species.	Retained vegetation will be maintained through implementation of a Vegetation Management Plan to reduce hazards from fire, pest species, degradation and other potential impacts. This will assist in maintaining the integrity of the vegetation as habitat and will reduce disturbance to surrounding habitat and conservation areas. Project design has sought to minimise the width of access tracks in areas of potential black-footed tree-rat habitat. Construction personnel will be educated on the potential presence of black-footed tree-rat. Off-track driving will not be permitted and reduced speed limits will be enforced in areas of potential habitat, with appropriate signage on site. Targeted revegetation of parts of the Project footprint not required for operation will occur using tree species likely to form hollows suitable for the black-footed tree-rat.
Weed and pest incursion	The Project has the potential to facilitate the spread of weeds and pest fauna through machinery, vehicles and materials brought to site from outside the Project area. Feral cats are likely to be a threat to the black-footed tree-rat.	The Project area is currently subjected to existing weed and pest impacts, with feral cats prevalent on site. During construction of the Project, weed and pest control measures will be established to minimise the risk of the Project further exacerbating the issue, including feral cat control to reduce predation on the species. A preliminary Weed and Pest Management Plan has been prepared (see **Appendix F**) and includes management of weed spread (with

Potential Impact	Assessment	Mitigation
		specific advice for key identified species), management of pest infestations and monitoring effectiveness of control measures. This plan will be further developed by the Construction Contractor prior to works commencing on site.
Species mortality (vehicle collision, vegetation clearance)	During vegetation clearing, there is potential for direct mortality if black-footed tree-rat are present (i.e. denning in the hollow-bearing trees to be cleared). There is also a risk of vehicle strike during construction.	Clearing of habitat could potentially result in significant injury or death to individual black-footed tree-rat, however clearing operations will be conducted in accordance with the provisions outlined in a sequential clearing procedure including the use of a fauna spotter catcher and retention of potential denning habitat overnight. The process will significantly mitigate any potential impacts associated with clearing operations ensuring black-footed tree-rat are detected, provided procedures are followed and spotters are allowed ample opportunity to check areas prior to construction. Hollow-bearing trees and hollow logs will be marked and inspected where possible for the presence of fauna prior to clearing. Clearing protocols will be developed including methods for clearing hollow-bearing trees (e.g. remove surrounding trees on previous day) and check for any injured species. Capture and release those healthy individuals. Any injured rats will be taken to a vet for treatment. Standard construction hours (6.30am to 6.30pm) will reduce the likelihood of construction vehicles driving within black-footed tree-rat habitat when this nocturnal species is active. Construction personnel will be educated on the potential presence of black-footed tree-rat. Off-track driving will not be permitted and reduced speed limits will be enforced in areas of potential rat habitat, with appropriate signage on site.
Erosion and sedimentation	Construction activities may alter surface water overland flow, leading to increased erosion of suitable habitat.	A preliminary Erosion and Sediment Control Plan (ESCP) (**Appendix I**) and a Sediment and Erosion Management Plan (**Appendix J**) have been prepared for the Project and will be further developed by the Construction Contractor prior to works commencing on site. Implementation of these plans will minimise soil loss from the disturbance areas.

Potential Impact	Assessment	Mitigation
Reduced air quality	Construction activities have the potential to degrade black-footed tree-rat habitat through smothering by dust.	Generally, dust is not expected to pose a significant risk in this high-rainfall area. Dust generating activities will be minimised during dry, windy conditions and areas of exposed soils will be rehabilitated as soon as practicable, to minimise dust emissions. Dust suppression (water spraying) will be used during the dry season as necessary.
Noise and lighting	As the black-footed tree-rat is a nocturnal species, there is the potential for to it be disturbed by noise and lighting impacts during Project construction.	Standard construction work hours will generally be between 6.30am and 6.30pm, therefore site lighting will be kept to the minimum required for safety. Where necessary, construction lighting will be directed to the required areas and designed to minimise light spill to adjacent areas. Construction equipment will be fitted with noise reduction devices where practicable and switched off when not in use
Bushfire risk	Inappropriate fire regimes are a threat to this species. The Project is not expected to increase the risk of high intensity bushfires in the Project area.	A Bushfire Management Plan will be prepared prior to construction and will be implemented during all on-site activities. Fuel loads will be monitored and managed through activities such as controlled grazing, cool mosaic burns and weed management.

8.6.1.2 Potential Operational Impacts from the Project and Relevant Mitigation

Potential operational impacts and proposed mitigation measures for the black-footed tree-rat are discussed in **Table 8-46**.

Table 8-46 Potential Operation Impacts and Relevant Mitigation – Black-footed Tree-rat

Potential Impact	Assessment	Mitigation
Species mortality (vehicle collision)	Increased traffic around the Project area has the potential to kill or injure fauna on impact although traffic levels will be greatly reduced during operations compared to the construction phase and more geared towards light or medium vehicles.	Mitigation measures outlined in **Section 6.0** will reduce risks associated with increased vehicle presence on site.
Bushfire risk	During operational activities, there is potential for heightened fire risk due to the increased presence of maintenance and monitoring vehicles	A Bushfire Management Plan will be prepared prior to construction and will be implemented during all on-site activities. Fuel loads will be monitored and managed

Potential Impact	Assessment	Mitigation
	and personnel in the Project area. This is through the use of machinery that may generate sparks, use of flammable liquids and idling vehicles being present in areas of ground vegetation.	through activities such as controlled grazing, cool mosaic burns and weed management.
Noise and lighting	There is limited scope for indirect impacts such as noise and lighting on this species resulting from Project operation.	Noise-generating activities during the operations phase will be negligible. Night lighting during the operations phase will be limited to that required for safety and security. Low luminance, directional lighting will be used in proximity to environmentally sensitive areas.
Weed and pest incursion	The Project has the potential to facilitate the spread of weeds and pest fauna through machinery, vehicles and materials brought to site from outside the Project area.	The Project area is currently subjected to existing weed and pest impacts, with feral cats prevalent across the site. During operation of the Project, weed and pest control measures will be established to minimise the risk of the Project further exacerbating the issue. Feral cat control will be undertaken – this will assist to reduce predation on black-footed tree-rats.

8.6.1.3 Assessment of Significant Residual Impacts

The Project is not expected to have a significant residual impact on the black-footed tree-rat (Vulnerable). A full significance assessment following the Significant Impact Guidelines (DoE 2013) is presented in **Table 8-47.**

Table 8-47 Significant Residual Impact – Black-footed Tree-rat

Significant Impact Criteria	Assessment
Lead to a long-term decrease in the size of an important population of a species	**Unlikely** Desktop assessment and extensive field surveys have not confirmed the presence of black-footed tree-rat within the Project area. Potential habitat has been mapped within the Project area on a precautionary basis. The Project area is not considered to support an important population of black-footed tree-rat. Aside from the sensitive design measures already employed for the Project, the measures proposed to manage vegetation clearing and fragmentation are expected to be effective in ensuring that the Project does not lead to a long-term decrease in the size of the Project area's black-footed tree-rat population, should it be present.

Significant Impact Criteria	Assessment
Reduce the area of occupancy of an important population	**Unlikely** The Project area is not considered to support an important population of black-footed tree-rat. The proposed removal of potential habitat associated with the Project is not concentrated in a manner that will remove one or more 4km^2 grid squares from the black-footed tree-rat's area of occupancy.
Fragment an existing important population into two or more populations	**Unlikely** The presence of black-footed tree-rat has not been confirmed within the Project area, despite extensive surveys. The Project area contains potential habitat for the species and the vast majority of this habitat will be retained within the Project area. Risks of fragmentation are likely to be highest where access roads cross areas of potential habitat. Aside from the sensitive design measures already employed for the Project, the measures proposed to manage vegetation clearing and fragmentation are expected to be effective in ensuring that the Project does not lead to fragmentation of an existing population into two or more populations. Large tracts of black-footed tree-rat habitat will remain within the Project area post clearing which are connected to larger habitats in adjacent areas. These retained and adjacent habitats will support the species and provide connectivity. Rehabilitation activities will also aim to restore habitats that will provide black-footed tree-rat foraging habitats over the short to medium term, and denning habitat in the longer term. The Project is not expected to fragment an existing important population into two or more populations.
Adversely affect habitat critical to the survival of a species	**Unlikely** The Project will not involve the removal of habitat critical to the survival of the species, the presence of which has not been confirmed within the Project area.
Disrupt the breeding cycle of an important population	**Unlikely** To avoid and minimise potential impacts on black-footed tree-rat breeding habitat and young, fauna spotter catchers will be present prior to and during clearing to check for the presence of the species and potential dens. If potential dens are to be cleared procedures will be put in place to minimise impacts to the species as outlined in a Species Management Plan. All identified suitable dens will be replaced on a 1:1 basis with suitable nest boxes for the species based on current best practice, or salvaged hollows from the cleared area. The Project is not expected to disrupt the breeding cycle of an important population.
Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	**Unlikely** The black-footed tree-rat has not been confirmed present but the Project area does contain potential habitat for the species. The vast majority of this habitat will be retained within the Project area.

Significant Impact Criteria	Assessment
	Nevertheless, the Project will involve the removal of 198.9 ha of potential habitat for the black-footed tree-rat. Large tracts of black-footed tree-rat habitat will remain within the Project area post clearing which are connected to larger habitats in adjacent areas. These retained and adjacent habitats will support the species and provide connectivity. Rehabilitation activities will also aim to restore habitats that will provide black-footed tree-rat foraging habitats over the short to medium term, and denning habitat in the longer term. Aside from the sensitive design measures already employed for the Project, the measures proposed to manage vegetation clearing and fragmentation are expected to be effective in ensuring that the Project does not lead to a decline in the species.
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	**Unlikely** Feral cats and considered threats to the black-footed tree-rat and are prevalent within the Project area. Clearing activities associated with the Project have the potential to open up areas that may be subject to weed incursion and increased prevalence of pest fauna. Areas of retained vegetation will be managed, including weed and pest animal control to maintain the retained areas in good condition and reduce threats. Hygiene protocols in the operational areas will also be implemented to reduce any weeds or disease being introduced to the Project area or spread from the Project area. Based on implementing the proposed mitigation measures it is not expected the Project will result in an increase of invasive species in the black-footed tree-rat habitat.
Introduce disease that may cause the species to decline	**Unlikely** It is not expected that the Project will introduce disease that may cause the species to decline.
Interfere substantially with the recovery of the species	**Unlikely** The Project is not expected to interfere substantially with the recovery of the species, the presence of which has not been confirmed. Clearing of habitat will be undertaken sequentially, and large areas of potential habitat will be retained across the Project area. This availability and connectivity of foraging and breeding habitat will ensure any black-footed tree-rat within the Project area will have available foraging and breeding resources. Fire will also be managed on site to ensure hot wildfires are minimised and potential den sites protected. Large tracts of habitat will remain within the Project area which are connected to larger habitats in adjacent areas. These retained and adjacent habitats will support the species and provide connectivity and maintain gene flow for the species.

8.6.2 Ghost Bat

As discussed in **Section 4.7.1**, the ghost bat has not been recorded within the Project area. Based on the assessment work undertaken, the presence of ghost bat within the Project area is considered highly unlikely. Nonetheless, potential foraging habitat has been mapped as woodland habitats within 2 km of areas of rocky relief that might provide roosting habitat (as identified through LiDAR analysis).

8.6.2.1 Potential Construction Impacts from the Project and Relevant Mitigation

Approximately 424 ha of potential roosting habitat and approximately 17,505 ha of potential foraging habitat is present within the Project area. Potential roosting habitat within the broader Study area is likely to be extensive though not possible to quantify (nor considered necessary) without extending LiDAR coverage for the full extent. Assuming there would be roosts present, there is approximately 21,421 ha of potential foraging habitat within the broader Study area. In the absence of confirmed species presence, habitat critical to the survival of the species has not been identified within the Project area.

The Project will require clearing of approximately 1 ha of potential roosting habitat and approximately 656 ha of potential foraging habitat for the ghost bat. Potential construction impacts and proposed mitigation measures for ghost bat are discussed further in **Table 8-48**.

Table 8-48 Potential Construction Impacts and Relevant Mitigation – Ghost Bat

Potential Impact	Assessment	Mitigation
Vegetation and habitat clearance	The Project may lead to the clearing of 1 ha of potential roosting habitat and 656 ha of potential foraging habitat for the species.	Large areas of potential roosting and foraging habitat for ghost bat throughout the Project area will be retained. Design has sought to avoid and minimise clearing within mapped areas of rocky relief which are more likely to support caves for roosting as well as adjacent foraging habitat. Vegetation clearing will be minimised as much as practicable through micrositing within the proposed Project footprint. Project infrastructure including laydown areas, construction compounds and substation have been sited in cleared areas where practicable to avoid clearing of potential ghost bat foraging habitat. Existing access tracks within the Project area are prioritised as part of the design to minimise any further clearing and fragmentation of vegetation communities. Clearing of potential ghost bat habitat will occur sequentially and in accordance with an approved Species Management Program.
Fragmentation (of populations and habitat)	The Project may lead to the clearing of 1 ha of potential roosting habitat	Existing access tracks within the Project area were prioritised as part of the design to

Potential Impact	Assessment	Mitigation
	and 656 ha of potential foraging habitat for the species.	minimise any further clearing and fragmentation of vegetation communities. Project design has sought to minimise the width of access tracks in areas of potential and critical ghost bat habitat. Retained vegetation will be maintained through implementation of a Vegetation Management Plan to reduce hazards from fire, pest species, degradation and other potential impacts. This will assist in maintaining the integrity of the vegetation as habitat and will reduce disturbance to surrounding habitat and conservation areas. Areas cleared for construction that are not required for the operational footprint will be sequentially rehabilitated as soon as practicable following construction.
Weed and pest incursion	The Project has the potential to facilitate the spread of weeds and pest fauna through machinery, vehicles and materials brought to site from outside the Project area. Competition for prey with feral cats and poisoning by cane toads are known threats to the ghost bat.	The Project area is currently subjected to existing weed and pest impacts, with established populations of feral cats and cane toads recorded across the site. During construction of the Project, weed and pest control measures will be established to minimise the risk of the Project further exacerbating the issue. This will include support and involvement in feral cat control programs where practical to reduce competition for prey with the ghost bat. A preliminary Weed and Pest Management Plan has been prepared (see **Appendix F**) and includes management of weed spread (with specific advice for key identified species), management of pest infestations and monitoring effectiveness of control measures. This plan will be further developed by the Construction Contractor prior to works commencing on site.
Species mortality (vehicle collision, vegetation clearance)	The risk of species mortality during construction is negligible, as ghost bat does not roost in trees and is unlikely to be struck by construction vehicles.	Standard construction hours (6.30am to 6.30pm) will reduce the likelihood of construction vehicles driving within ghost bat habitat when this nocturnal species is active.
Erosion and sedimentation	The ghost bat is unlikely to be directly impacted by erosion and reduced water quality resulting from Project construction.	A preliminary Erosion and Sediment Control Plan (ESCP) (**Appendix I**) and a Sediment and Erosion Management Plan (**Appendix J**) have been prepared for the Project and will be

Potential Impact	Assessment	Mitigation
		further developed by the Construction Contractor prior to works commencing on site. Implementation of these plans will minimise soil loss from the disturbance areas.
Dust emissions	There is limited scope for indirect impacts from dust emissions on this species resulting from Project construction.	Generally, dust is not expected to pose a significant risk in this high-rainfall area. Dust generating activities will be minimised during dry, windy conditions and areas of exposed soils will be rehabilitated as soon as practicable, to minimise dust emissions. Dust suppression (water spraying) will be used during the dry season as necessary.
Noise and vibration	Vibration from construction activities has the potential to damage or destroy ghost bat roosts within caves. Noise emissions may cause general disturbance to ghost bat.	The need for rock blasting has not yet been confirmed. Should it be required, an assessment will be undertaken of the blast pressure zone to consider whether any potential ghost bat roosts are at risk of being damaged or destroyed, and additional abatement measures will be developed as required. Blasting will be avoided within potential ghost bat roosting habitat between July and November as far as practicable, when the bats are breeding. Construction equipment will be fitted with noise reduction devices where practicable and switched off when not in use.
Light emissions	The ghost bat is a nocturnal species and therefore may be disturbed by light emissions associated with the Project.	Standard construction work hours will generally be between 6.30am and 6.30pm, therefore site lighting will be kept to the minimum required for safety. Where necessary, construction lighting will be directed to the required areas and designed to minimise light spill to adjacent areas.
Bushfire risk	Modification of foraging habitat due to bushfire is a known threat to this species. The Project is not expected to increase the risk of high intensity bushfires in the Project area.	A Bushfire Management Plan will be prepared prior to construction and will be implemented during all on-site activities. Fuel loads will be monitored and managed through activities such as controlled grazing, cool mosaic burns and weed management.

8.6.2.2 Potential Operational Impacts from the Project and Relevant Mitigation

Potential operational impacts and proposed mitigation measures for the ghost bat are discussed in **Table 8-49**.

Table 8-49 Potential Operation Impacts and Relevant Mitigation – Ghost Bat

Potential Impact	Assessment	Mitigation
Collision risk	The risk of ghost bats colliding with wind turbines during Project operation is considered negligible as the species does not fly within the RSA height.	None required.
Barotrauma	As the ghost bat does not fly within RSA height, the risk of barotrauma is considered negligible.	None required.
Bushfire risk	During operational activities, there is potential for heightened fire risk due to the increased presence of maintenance and monitoring vehicles and personnel in the Project area. This is through the use of machinery that may generate sparks, use of flammable liquids and idling vehicles being present in areas of ground vegetation.	A Bushfire Management Plan will be prepared prior to construction and will be implemented during all on-site activities. Fuel loads will be monitored and managed through activities such as controlled grazing, cool mosaic burns and weed management.
Noise and lighting	There is potential for indirect impacts such as noise and lighting on this species resulting from Project operation.	Noise-generating activities during the operations phase will be negligible. Night lighting during the operations phase will be limited to that required for safety and security. Low luminance, directional lighting will be used in proximity to environmentally sensitive areas.
Weed and pest incursion	The Project has the potential to facilitate the spread of weeds and pest fauna through machinery, vehicles and materials brought to site from outside the Project area.	The Project area is currently subjected to existing weed and pest impacts, with feral cats prevalent across the site. During operation of the Project, weed and pest control measures will be established to minimise the risk of the Project further exacerbating the issue. During construction of the Project, weed and pest control measures will be established to minimise the risk of the Project further exacerbating the issue. This will include support and involvement in feral cat control programs where practical to reduce competition for prey with the ghost bat.

8.6.2.3 Assessment of Significant Residual Impacts

The Project is not expected to have a significant residual impact on the ghost bat (Vulnerable). A full significance assessment following the Significant Impact Guidelines (DoE 2013) is presented in **Table 8-50**.

Table 8-50 Significant Residual Impact – Ghost Bat

Significant Impact Criteria	Project Outcome
Lead to a long-term decrease in the size of an important population of a species	**Unlikely** The presence of ghost bat has not been confirmed within the Project area, and the Project area is unlikely to support an important population of the species. Nonetheless, potential roosting and foraging habitat has been mapped within the Project area on a precautionary basis. Aside from the sensitive design measures already employed for the Project, the measures proposed to manage vegetation clearing and fragmentation are expected to be effective in ensuring that the Project does not lead to a long-term decrease in the size of the Project area's ghost bat population, should it be present.
Reduce the area of occupancy of an important population	**Unlikely** The presence of ghost bat has not been confirmed within the Project area, and the Project area is unlikely to support an important population of the species. The proposed removal of potential ghost bat habitat associated with the Project is not concentrated in a manner that will remove one or more 4 km^2 grid squares from the ghost bat's area of occupancy.
Fragment an existing important population into two or more populations	**Unlikely** The presence of ghost bat has not been confirmed within the Project area, and the Project area is unlikely to support an important population of the species. The Project area contains a mixture of potential roosting and foraging habitat for the species. The vast majority of this habitat will be retained within the Project area. Aside from the sensitive design measures already employed for the Project, the measures proposed to manage vegetation clearing and fragmentation are expected to be effective in ensuring that the Project does not lead to fragmentation of an existing population into two or more populations. Large tracts of ghost bat habitat will remain within the Project area post clearing which are connected to larger habitats in adjacent areas. These retained and adjacent habitats will support the species and provide connectivity. Rehabilitation activities will also aim to restore vegetation communities that will provide ghost bat foraging habitat over the short to medium term.
Adversely affect habitat critical to the survival of a species	**Unlikely** In the absence of confirmed species presence, habitat critical to the survival of the ghost bat has not been identified within the Project area. Given the extent of potential habitat remaining in the locality, coupled with the implementation of the proposed mitigation measures, the Project is not considered likely to adversely affect habitat critical to the survival of the species.

Significant Impact Criteria	Project Outcome
Disrupt the breeding cycle of an important population	**Unlikely** Ghost bats breed between July and November and maternity roosts as sensitive to disturbance during this time. LiDAR analysis supported by habitat assessments in the field has confirmed there is limited potential roosting habitat within the Project area and the species has not been confirmed present. Blasting will not be undertaken in proximity to roosting habitat during the breeding season. The Project is therefore not expected to disrupt the breeding cycle of an important population
Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	**Unlikely** The Project area contains a mixture of potential roosting and foraging habitat for the species. The vast majority of this habitat will be retained within the Project area. Nevertheless, the Project will involve the removal of 656ha of potential foraging habitat and 1 ha of potential roosting habitat for the ghost bat. Large tracts of ghost bat habitat will remain within the Project area post clearing which are connected to larger habitats in adjacent areas. These retained and adjacent habitats will support the species and provide connectivity. Rehabilitation activities will also aim to restore vegetation communities that will provide ghost bat foraging habitat over the short to medium term. Aside from the sensitive design measures already employed for the Project, the measures proposed to manage vegetation clearing and fragmentation are expected to be effective in ensuring that the Project does not lead to a decline in the species.
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	**Unlikely** Feral cats and cane toads are prevalent within the Project area. Clearing activities associated with the Project have the potential to open up areas that may be subject to weed incursion and increased prevalence of pest fauna. Areas of retained vegetation will be managed, including weed and pest animal control to maintain the retained areas in good condition and reduce threats. Hygiene protocols in the operational areas will also be implemented to reduce any weeds or disease being introduced to the Project area or spread from the Project area. Based on implementing the proposed mitigation measures it is not expected the Project will result in an increase of invasive species in the ghost bat habitat
Introduce disease that may cause the species to decline	**Unlikely** It is not expected that the Project will introduce disease that may cause the species to decline.
Interfere substantially with the recovery of the species	**Unlikely** There is no recovery plan currently in place for the ghost bat. The Project is not expected to interfere substantially with the recovery of the species, the presence of which has not been confirmed within the Project area. Clearing of habitat will be undertaken sequentially, and

Significant Impact Criteria	Project Outcome
	large areas of potential roosting and foraging habitat will be retained across the Project area. This availability and connectivity of foraging and breeding habitat will ensure any ghost bats within the Project area will have available foraging resources. Fire will also be managed on site to ensure hot wildfires are minimised and potential roost sites protected. Large tracts of habitat will remain within the Project area which are connected to larger habitats in adjacent areas. These retained and adjacent habitats will support the species and provide connectivity and maintain gene flow for the species.

8.6.3 Koala

As discussed in **Section 4.7.3**, no evidence of koalas was observed in the Project area during field surveys in over 24 months. Both landholders report never having seen koalas on their properties over the c. 15 years of their occupancy and its occurrence on the Yourka Nature Reserve, immediately to the south, is rare (the species was recorded there for the first time in over a decade in October 2020). The Project area is not a stronghold for any koala population and if koalas are present within the Project area, it is likely to be on a very sporadic basis and/or in low numbers.

In the absence of the species' presence having been confirmed, the Project area is not considered to support an important population of koala. Koala habitat in the Project area has therefore been mapped as remnant and regrowth vegetation communities containing the locally important koala tree species or ancillary tree species listed in **Section 4.7.3**

8.6.3.1 Potential Construction Impacts from the Project and Relevant Mitigation

Approximately 25,231 ha of potential habitat for koala occurs within the Project area, and 92,634 ha occurs within the broader Study area.

The Project will require clearing of 413.6 ha of potential habitat for koala during Stage 1 and 430.2 ha during Stage 2 (843.8 ha in total across both Stages), as illustrated in **Figure 8-3**. Potential construction impacts and proposed mitigation measures for koala are discussed in **Table 8-51**.

Table 8-51 Potential Construction Impacts and Proposed Mitigation–- Koala

Potential Impact	Assessment	Proposed Mitigation
Vegetation and habitat clearance	The Project may lead to the clearing of 843.8 ha of potential habitat for the species.	Large areas of potential koala habitat throughout the Project area will be retained. Vegetation clearing will be minimised as much as practicable through micrositing within the proposed Project footprint. Project infrastructure including laydown areas, construction compounds and substation have been sited in cleared areas where practicable to avoid clearing of potential habitat. Existing access tracks within the Project area are prioritised as part of the design to minimise any further clearing and fragmentation of vegetation communities. Clearing of potential koala habitat will occur sequentially in accordance with a Species Management Plan. Areas cleared for construction that are not required for the ongoing operation of the Project will be progressively rehabilitated in accordance with the Preliminary Rehabilitation Plan (see **Appendix K**).
Fragmentation (of populations and habitat)	The Project may lead to the clearing of 843.8 ha of habitat for the species.	Existing access tracks within the Project area were prioritised as part of the design to minimise any further clearing and fragmentation of vegetation communities. Vegetation clearing will be minimised as much as practicable through micrositing within the proposed Project footprint. Retained vegetation will be maintained through implementation of a Vegetation Management Plan to reduce hazards from fire, pest species, degradation and other potential impacts. This will assist in maintaining the integrity of the vegetation as habitat and will reduce disturbance to surrounding habitat and conservation areas. Given the broad and generally linear nature of the Project footprint (narrow in the context of the broader retained vegetation), the Project is unlikely to lead to fragmentation impacts. Areas cleared for construction that are not required for the operational footprint will be sequentially rehabilitated as soon as practicable following construction.
Weed and pest incursion	The Project has the potential to facilitate the spread of weeds and	The Project area is currently subjected to existing weed and pest impacts, including an established

Potential Impact	Assessment	Proposed Mitigation
	pest fauna through machinery, vehicles and materials brought to site from outside the Project area.	population of wild dogs. During construction of the Project, weed and pest control measures will be established to minimise the risk of the Project further exacerbating the issue. A preliminary Weed and Pest Management Plan has been prepared (see **Appendix F**) and includes management of weed spread (with specific advice for key identified species), management of pest infestations and monitoring effectiveness of control measures. This plan will be further developed by the Construction Contractor prior to works commencing on site. Wild dog control will be undertaken – this will assist to reduce predation on koalas.
Species mortality (vehicle collision, vegetation clearance)	The species is susceptible to vehicle strike; this risk may increase during the construction phase of the Project. During vegetation clearing, there is potential for direct mortality if koalas are present in the vegetation to be cleared.	Clearing of habitat could potentially result in significant injury or death to individual koalas, however clearing operations will be conducted in accordance with the provisions outlined in a sequential clearing procedure including the use of a fauna spotter catcher and retention of habitat trees overnight. Any clearing would take place in a way to allow koalas (if present) to move into adjacent areas of retained vegetation. This will include allowing escape paths to retained vegetation to be maintained. If koalas are encountered they are to be left in-situ, works are to stop in the area, and the Project personnel must wait for the animal to move to retained habitat.
Erosion and sedimentation	The koala is unlikely to be directly impacted by erosion and reduced water quality resulting from Project construction.	A preliminary Erosion and Sediment Control Plan (ESCP) (**Appendix I**) and a Sediment and Erosion Management Plan (**Appendix J**) have been prepared for the Project and will be further developed by the Construction Contractor prior to works commencing on site. Implementation of these plans will minimise soil loss from the disturbance areas.
Bushfire risk	Bushfire presents a significant risk to the koala. The Project is not expected to increase the risk of high intensity bushfires in the Project area.	A Bushfire Management Plan will be prepared prior to construction and will be implemented during all on-site activities. Fuel loads will be monitored and managed through activities such as controlled grazing, cool mosaic burns and weed management.
Noise and lighting	There is the potential for koalas be disturbed by noise and lighting	Standard construction work hours will generally be between 6.30am and 6.30pm, therefore site

Potential Impact	Assessment	Proposed Mitigation
	impacts during Project construction.	lighting will be kept to the minimum required for safety. Where necessary, construction lighting will be directed to the required areas and designed to minimise light spill to adjacent areas. Construction equipment will be fitted with noise reduction devices where practicable and switched off when not in use
Dust emissions	There is limited scope for indirect impacts from dust emissions on this species resulting from Project construction	Generally, dust is not expected to pose a significant risk in this high-rainfall area. Dust generating activities will be minimised during dry, windy conditions and areas of exposed soils will be rehabilitated as soon as practicable, to minimise dust emissions. Dust suppression (water spraying) will be used during the dry season as necessary.

ARK ENERGY

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Chalumbin Wind Farm

Impacts to Koala habitat

Sheet 1 of 4

Figure 8.3

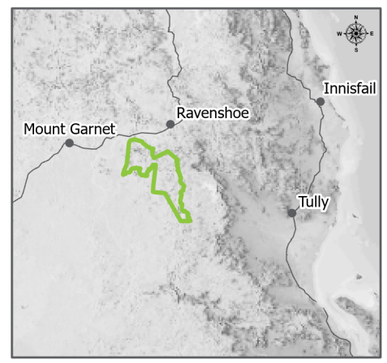
- Project Area Boundary
- Turbine
- Met-mast
- Facilities

Clearance Envelope

- Stage 1
- Stage 2
- Significant Residual Impact
- Locally important koala trees
- Ancillary habitat trees
- Existing HV Transmission Line
- Watercourse
- WTQ Boundary
- Lot Boundary
- Easement

Date: 10/10/2022 Author: TOD

Project: EPU-004 Reviewed: NOD



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Data Source(s):
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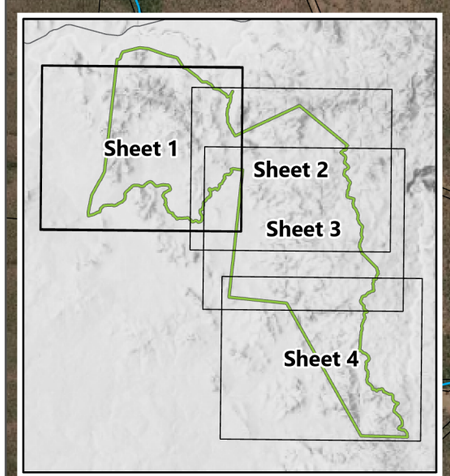


ARK ENERGY

Attexo

Chalumbin Wind Farm

Impacts to Koala habitat

Sheet 2 of 4

Figure 8.3

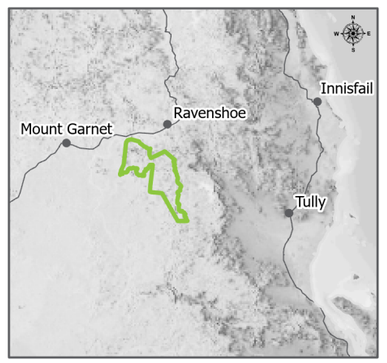
- Project Area Boundary
- Turbine
- Met-mast
- Facilities

Clearance Envelope

- Stage 1
- Stage 2
- Significant Residual Impact
- Locally important koala trees
- Ancillary habitat trees
- Existing HV Transmission Line
- Watercourse
- WTQ Boundary
- Lot Boundary
- Easement

Date: 10/10/2022 Author: TOD

Project: EPU-004 Reviewed: NOD



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Scale: 1:50,000@A3

Data Source(s):
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