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WRE WESTCOAST RENEWABLE ENERGY

Whaleback Ridge Renewable Energy Project

Major Project Proposal

Final | 6 October 2023

Acknowledgement of Country

We acknowledge and respect palawa people as the Traditional Owners of lutruwita (Tasmania).

They are the original custodians of our land and waters. We respect their unique ability to care for country and deep spiritual connection to it.

We honour Elders past and present whose knowledge and wisdom has and will ensure the continuation of culture and traditional practices.

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Executive summary

Westcoast Renewable Energy Pty Ltd (WRE) is proposing the development of the Whaleback Ridge Renewable Energy Project (the Project) in the west coast region of Tasmania. The Project comprises up to 500 wind turbine generators (WTGs) with a projected generating capacity of approximately 3,000 megawatts (MW) and ancillary infrastructure including a network of access roads, electrical infrastructure, and operations facilities. Temporary, onsite quarries to facilitate the construction of the Project may be established, together with onsite concrete batching using mobile batching plants within the Project Site. The Project represents the largest renewable energy project in Tasmania.

The Project is located within the North West Tasmania Renewable Energy Zone (REZ), designated by the Australian Energy Market Operator (AEMO) in the Integrated System Plan. The Project Site has a high-capacity factor for wind, which allows more renewable energy to be developed from less resources and lowers the cost of renewable energy generation. The suitability of the region for the development of a wind farm is demonstrated by the existing Granville Harbour Wind Farm, located to the west of the Project Site and data from four meteorological monitoring masts installed at the Project Site. Members of WRE were responsible for the successful development of the Granville Harbour Wind Farm with demonstrated experience in delivering large-scale renewable energy projects on the west coast.

In addition to the strong wind resource, the Project Site has access to existing transmission line corridors that connect to the North West Transmission Line upgrades (including Marinus Link). The Project will provide opportunities for future on island renewable energy industry developments such as renewable hydrogen and green fuels.

The Project Site selection has sought to minimise the potential environmental impacts of the Project. Avifauna surveys undertaken during 2021 and 2022 have recorded a low abundance of bird species utilising the site, with the lowest density of wedge-tailed eagles and white-bellied sea eagles of all wind farm sites currently proposed in Tasmania (Nature Advisory, 2023). The Project Site is dominated by buttongrass plateaus which provide relatively limited habitat for threatened species (Nature Advisory, 2023). The Project Site is remote from neighbouring communities and has strong community support, including from regional businesses associated with Advanced West North West Inc. Eight regional councils, as members of the Cradle Coast Authority, consider the Project to be of significance to the region.

The Project is seeking to follow the major projects assessment process under the *Land Use Planning and Approvals Act 1993* (LUPAA). This major project proposal (MPP) has been prepared to address the relevant provisions of LUPAA to allow the declaration of a major project. The Project satisfies the three eligibility criteria required to be declared a major project under section 60M(1) of LUPAA, presented below.

(1) The project will have a significant impact on, or make a significant contribution to, a region's economy, environment or social fabric.

The Project will bring significant investment to the economy in the north-west coast region of Tasmania, with an approximate $5 billion AUD capital expenditure (CAPEX) investment. The operational expenditure (OPEX) of the Project is approximately $20.2 billion over an initial 30-year project life. The Project is expected to generate significant employment opportunities in the region through the creation of approximately 170 full-time equivalent (FTE) positions during the construction of the first stage of the Project (288 MW). Once operational, the first stage of the Project is expected to generate 16 FTE positions per annum. As the Project moves into subsequent stages, further construction and operational phase employment opportunities will be generated. The local employment opportunities generated by the Proposal will result in growth in skilled jobs in the region and diversify and strengthen the regional economy. As the Project will be largely located on Crown land, there is potential for contribution to the Tasmanian economy through lease arrangements. Eight regional councils, as members of the Cradle Coast Authority, consider the Project to be of significance to the region.

(2) The project is of strategic importance to a region.

The Project aligns with Tasmania's strategic goals under the Tasmania Renewable Energy Action Plan and will produce enough energy to achieve the Tasmanian Renewable Energy Target (TRET) of 200% renewable energy by 2040.

The Project will provide low-cost renewable energy at scale and has the capacity to support the development of renewable hydrogen production facilities, which will contribute to Tasmania's aim under the Tasmania Renewable Hydrogen Action Plan to become a significant global supplier of renewable hydrogen for export and domestic use by 2030.

The scale of the Project will create opportunities for further investment in the north- west region, through the development of industries involved in the renewable energy supply chain (e.g. manufacturing) and attracting green industries that require a reliable, low-cost renewable energy source (e.g. hydrogen and efuel).

The Project is capable of supporting the North West Transmission upgrades and Marinus Link, which will facilitate Australia's transition to renewable energy.

(3) The project is of significant scale and complexity.

The Project Site is an approximately 40,500 hectare (ha) area of mixed land tenures, including large areas of Crown land which will require a range of planning and environmental approvals under State legislation.

Within the Project Site, indicative turbine exclusion zones have been established to site project infrastructure to avoid environmentally sensitive locations and minimise the potential impacts of the Project. The turbine exclusion zones have been based on multiple assessments and include coastal exclusions for orange-bellied parrot migration, slope constraints, vegetation communities containing forest habitat, sensitive receptors, waterways and existing roads. The turbine exclusion zones will be subject to further refinement during the impact assessment phase of the Project to achieve the lowest impact design. The expected operational footprint within the Project Site is expected to be less than 500 ha, following construction and rehabilitation of any temporary disturbances.

The Project Site comprises multiple land tenures within the West Coast Council municipal area, regional reserves and other types of Crown land, including permanent timber production zone land and future potential production forest land.

In addition to the major projects assessment process and approval under LUPAA, the Project will be subject to assessment and approval under the Reserve Activity Assessment process for the purposes of granting an authority under the *National Parks and Reserves Management Act 2002*. It will also be subject to a suite of secondary approvals, including under the *Threatened Species Protection Act 1995*, *Aboriginal Heritage Act 1975*, *Nature Conservation Act 2002*, *Crown Lands Act 1976* and the *Environmental Management and Pollution Control Act 1994*.

Information requirements

LUPAA sets out the information requirements for a MPP under section 60F. The contents for a declaration of a major project by the Minister are established under section 60Q of the Act. A summary of where these information requirements have been addressed in this MPP is provided in Table 1.

Table 1 Summary of information requirements under LUPAA

Clause	Requirement	Relevant section of MPP
Contents of a major project proposal		
60F(1)(a)	The name and contact details of the proponent of the project.	Section 1.2
60F(1)(b)	Details of the proponent's experience and of the proponent's financial capacity to implement the project.	Section 1.2
60F(1)(c)	The name of the project.	Section 1.1
60F(1)(d) 60F(2)(a)	A general description of the project, including – (i) the activities that are proposed to be carried out as part of the project after the construction phase of the project is completed; and (ii) the proposed uses or developments that are proposed to occur in relation to the project.	Section 3
60F(1)(e) and 60F(2)(b)	A map, or description, indicating the location of the proposed land on which the project is to be situated and (in accordance with subsection 2) a plan setting out generally the types of infrastructure and the areas within any part of which such infrastructure may be situated.	Figure 1 and Figure 2
60F(1)(f)	A general description of the physical features of - (i) the areas of land on which the project is to be situated; and (ii) the areas of land, in the vicinity of the areas of land on which the project is to be situated, that it is anticipated may be affected by the project.	Section 4
60F(1)(g)	The anticipated effect, if any, on other areas of land that are in the vicinity of the areas of land on which the project is to be situated, of the project or infrastructure associated with the project.	Section 5
60F(1)(h)	The key environmental, health, economic, social and heritage effects of the project that the proponent has identified and, if the effects may be detrimental, the measures that the proponent proposes to take to mitigate those effects.	Section 5
60F(1)(i)	The surveys, and studies, proposed or being undertaken in respect of the project.	Section 6
60F(1)(j)	The proposed timetable for the completion of the construction phase of the project.	Section 7
60F(1)(k)	Whether the project is a bilateral agreement project.	Section 12.3
60F(1)(l)	A statement as to why the Minister ought to be of the opinion that the project is eligible under section 60M to be declared a major project.	Section 2
60F(1)(m)	An assessment of the extent to which the project complies with the requirements of the relevant planning scheme and a statement as to the amendments, if any, that would be required to be made to an LPS in order for the project to so comply.	Section 8
60F(1)(n)	Information as to the consents referred to in section 60P(2) that have been obtained.	Section 9
60F(1)(o)	Details of any consultation, with persons who may have an interest in whether the project is implemented, that has occurred or is proposed to occur.	Section 10
60F(1)(p)	Details of any feasibility assessment that has been undertaken, in relation to the project, by the proponent.	Section 11
60F(1)(q)	Any other information that is prescribed to be required to be provided for the purposes of this section.	Section 12
60F(3)	The reference in subsection (1)(g) to the anticipated effect, on other areas of land, of the project or infrastructure associated with the project, includes –	Section 5

Clause	Requirement	Relevant section of MPP
	(a) the anticipated effect on areas that are within, as well as areas that are outside, the regional area in which the project is to be situated; and (b) the anticipated effect on the provision of physical, social and other infrastructure in those other areas.	
Contents of a declaration of a major project		
60Q(1)(a)	A map, or description, indicating the location of the land on which the project is to be situated.	Figure 1
60Q(1)(b) and 60Q(2)(a)	A general description of – (i) the activities that are proposed to be carried out as part of the project after the construction phase of the project is completed; and (ii) the proposed uses or developments that are proposed to occur in relation to the project.	Section 3
60Q(1)(c) and 60Q(2(b)	A plan setting out generally the types of infrastructure and the areas of the land within any part of which such infrastructure may be situated.	Figure 2
60Q(1)(d)	The name of the proponent of the major project.	Section 1.2

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Glossary

Abbreviation	Definition
AEMO	Australian Energy Market Operator
AHR	Aboriginal Heritage Register
CAPEX	capital expenditure
CASA	Civil Aviation Safety Authority
CCRLUS	Cradle Coast Regional Land Use Strategy
EMI	electromagnetic interference
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Cth)
FPPF	future potential production forest
FTI	full-time equivalent
kV	kilovolt
LGA	local government area
LUPAA	*Land Use Planning and Approvals Act 1993* (Tas)
MW	megawatts
MPIS	major project impact statement
MPP	major project proposal
OLS	obstacle limitation surface
the Project	Whaleback Ridge Renewable Energy Project
Project Site	the site on which the Whaleback Ridge Renewable Energy Project will be situated
PTPZ	permanent timber production zone
PAL Policy	*State Policy on the Protection of Agricultural Land 2009*
REZ	renewable energy zone
SCP	*State Coastal Policy 1996*
SPPWQM	*State Policy on the Protection of Water Quality Management 1997*
TSP Act	*Threatened Species Protection Act 1995* (Tas)
TRET	Tasmanian Renewable Energy Target
TPPs	Tasmanian Planning Policies
TWWHA	Tasmanian Wilderness World Heritage Area

Abbreviation	Definition
WRE	Westcoast Renewable Energy Pty Ltd
WTG	wind turbine generator

1 Introduction

This major project proposal (MPP) has been prepared to accompany a proposal to the Minister under section 60C(1) of the *Land Use Planning and Approvals Act 1993* (LUPAA/the Act) to seek a declaration of the Whaleback Ridge Renewable Energy Project (the Project) as a major project under the Act.

1.1 Project overview

Westcoast Renewable Energy Pty Ltd (WRE) proposes to develop the Whaleback Ridge Renewable Energy Project (the Project) on an approximately 40,500 hectare site located in the central western region of Tasmania (the Project Site – see Figure 1).

The Project includes the development of up to 500 wind turbine generators (WTGs), with a projected generating capacity of approximately 3,000 megawatts (MW). The Project will involve construction of collector substations and the installation of overhead and underground transmission lines within the Project Site to connect the Project to the existing Farrell-Reece 220 kilovolt (kV) transmission line. The existing transmission line has sufficient capacity to allow the connection of the first stage of the Project (288 MW) to the national electricity market (TasNetworks, 2022). Future transmission requirements for the subsequent stages of the Project will be determined based on market demand and the location(s) of the end user(s). Staging of the Project and future transmission requirements are discussed in Section 3.1.3. A network of access roads within the Project Site will be developed (using existing access routes where possible). Other ancillary infrastructure required for the Project includes an office and workshop facilities. Temporary onsite quarries to facilitate the construction of the Project may be established together with onsite concrete batching using mobile batching plants within the Project Site.

As the largest renewable energy project in Tasmania, the Project will produce enough energy to achieve the TRET of 200% renewable energy by 2040. The Project will facilitate the export and local use of renewable energy and will contribute to decarbonisation on a local, national and global scale. The scale of the Project will create opportunities for further investment in the central west region, through the development of industries involved in the renewable energy supply chain and attracting green industries that require a reliable, low-cost renewable energy source.

1.2 Proponent

1.2.1 Name and contact details of proponent

This section addresses the requirements of 60F(1)(a) of LUPAA.

Contact details for the proponent are provided below.

Name of proponent: Westcoast Renewable Energy Pty Ltd
ACN: 633 216 163
Registered address: 658 Granville Harbour Road, Granville Harbour, TAS 7469
Postal address: PO Box 10, Zeehan TAS 7469
Contact Person: Alan Morrell – Chief Executive
Email: alan.morrell@westcoastrenew.com.au
Telephone: 0456 850 118

1.2.2 Proponent's experience and financial capacity

This section addresses the requirements of 60F(1)(b) of LUPAA.

The Project proponent is Westcoast Renewable Energy Pty Ltd (WRE). WRE is unique in that it is a Tasmanian-owned and operated business with international experience, that is focused on developing large-scale renewable energy projects in Tasmania. As a Tasmanian entity, WRE is an integrated part of local community and is focused on delivering renewable energy projects that provide maximum benefit for Tasmanians. WRE is committed to supporting the west and north-west regions of Tasmania through the development of renewable energy projects that have strong social, economic and environmental benefits.

WRE has demonstrated experience in developing large-scale renewable energy projects on the west coast of Tasmania. The team successfully developed Granville Harbour Wind Farm, located adjacent to the Project Site. The Granville Harbour Wind Farm was sold to Palisade Infrastructure Partners in 2018, commissioned in 2020 and resulted in a $280 million capital expenditure investment in Tasmania. With a capacity of 112 MW, the Granville Harbour Wind Farm made a significant contribution to achieving the 100% TRET one year ahead of schedule.

In 2022, WRE's experience and capability in infrastructure development and institutional financing was expanded through investment from the founder of Stilmark Holdings (sold to OMERS Infrastructure in 2022). Stilmark was re-branded to Waveconn and is now Australia's largest independent mobile network infrastructure owner.

1.2.3 Project development and financing

Resourcing and financing will be undertaken according to the requirements of each phase of Project development. Resourcing for the Project will continue to increase as the Project progresses through the development phases and milestones outlined below.

WRE has completed the investment required for Phase 1 of the Project development, which includes delivering the baseline feasibility and impact studies outlined in this MPP. This includes the installation of four meteorological monitoring masts on the Project Site, confirming the wind resource.

As the Project progresses towards final investment decision, WRE has sought investment partners for phases 2 and 3, prioritising tier-1 global firms and organisations capable of investing the magnitude of funds to deliver the required CAPEX (estimated to be $5 billion).

WRE has support for partnerships for the Project that will bring the additional capacity and capability to deliver both the financial investment required and the expertise and resourcing for Project delivery. Support for partnerships towards the final investment decision and delivery of the Project (should the Project progress through the major project approvals phase) include Brookfield Renewable Partners and Lighthouse Industries Holdings Pty Ltd (Lighthouse). WRE will continue to work to grow and expand partnerships throughout the impact assessment phase of the Project with both Brookfield Renewable Partners, Lighthouse, and additional tier 1 global firms to attract investment into the Project and investment into Tasmania for associated manufacturing opportunities. Further information on Brookfield Renewable Partners and Lighthouse is provided below. Letters of support are provided in Appendix A.

1.2.3.1 Brookfield Asset Management Ltd and Brookfield Renewable Partners

Brookfield is a leading global alternative asset manager with approximately US$850 billion of assets under management (as of June 2023) across renewable power, infrastructure, real estate, private equity and credit in North and South America, Europe and Australasia. Building on a history as an owner and operator that dates back more than 100 years, Brookfield invests in long-life assets and businesses. Brookfield's investment portfolio supports approximately 200,000 employees in over 30 countries. Brookfield is committed to having a positive impact on the communities in which they operate.

Brookfield Asset Management's renewable power and energy transition area is provided through Brookfield Renewable Partners (BEP). BEP operates one of the world's largest renewable power and energy transition platforms, with approximately US$79 billion of assets under management (as of June 2023). BEP is a global leader in decarbonisation with multiple technology portfolios consisting of approximately 32 GW of installed capacity and 132 GW in the development pipeline that includes wind, solar energy storage (including batteries) and pumped hydro.

With an equity market capitalisation of approximately US$20 billion, BEP is one of the largest publicly traded renewable energy transition platforms.

1.2.3.2 Lighthouse Industries Holdings Pty Ltd

Lighthouse is one of Australia's leading integrated renewable energy infrastructure investors and developers. Lighthouse is consolidating and scaling the Australian operational, manufacturing, and industrial capability necessary for the development of critical energy infrastructure to accelerate Australia's transition to renewable energy.

Th capability consolidated by Lighthouse forms an end-to-end client solution under a build-own-operate model, specific to non-generation balance of plant/facilitation infrastructure.

Lighthouse is currently active in scaling existing Australian sovereign manufacturing capability. Lighthouse's manufacturing operations team previously lead a global ~US$10 billion annual capital investment program in automation and advanced manufacturing assets.

In addition, Lighthouse is evaluating the establishment of multiple large format greenfield manufacturing facilities for key component inputs to support the energy transition. These components have the potential to be utilised in the Whaleback Ridge Renewable Energy Project.

Due to the Project scale and parallel growth in global demand, Lighthouse believes the Whaleback partnership has the potential to underwrite significant new manufacturing investment in Australia (and potentially Tasmania), further supporting the accelerated delivery of the Project.

1.3 Future opportunities

The Project will have the capacity to generate a large-scale supply of low-cost renewable energy to be used in the Tasmanian market and/or exported interstate. A future opportunity arising from the Project is the development of efuel hydrogen production facilities for the export of renewable energy and for renewable energy use within the state.

In the 2022 Budget, the Australian Government committed $2.4 million AUD to WRE to fund feasibility studies related to hydrogen production and associated infrastructure upgrades (including transmission, port and road infrastructure) in the north-west of Tasmania. This includes development of local supply chain opportunities, including local manufacturing of major components. The feasibility studies are scheduled to commence during the second half of 2023 and will identify opportunities for multiple downstream industries. The total cost of the feasibility studies will be $4.4 million, with the Australian Government matching WRE spend of $2.4 million.

Future opportunities associated with renewable hydrogen production will be subject to separate approvals and are entirely excluded from this MPP.

1.4 Project background and rationale

The proponent identified the potential for wind development on the west coast of Tasmania more than 10 years ago, through the development of Granville Harbour Wind Farm. Granville Harbour Wind Farm is one

of the best performing wind farms in Australia, with one of the highest capacity factors[1]. The high-capacity factor of the site allows more renewable energy to be generated from less resources, resulting in cheaper and more available renewable energy.

In 2018, the proponent commenced feasibility studies for a wind farm located on Crown land between Zeehan and Granville Harbour. The site selection process considered a variety of factors, with the Project Site presenting the following benefits associated with strategic planning, resource availability, existing infrastructure and environmental impacts.

Strategic planning benefits:

- The area is designated as a renewable energy zone (REZ) by the Australian Energy Market Operator (AEMO).
- Most of the area is classified as a regional reserve under the Tasmanian *National Parks and Reserve Management Act 2002* (NPRM Act). The Project is consistent with the purpose of a regional reserve (Schedule 1 – *Nature Conservation Act 2002*) and management objectives (Schedule 1 – NPRM Act) (see Section 8.2).

Resource availability:

- There is a world class wind resource, proven by the success of the neighbouring Granville Harbour Wind Farm.
- The Heemskirk Wind Farm proposal was previously approved in part of the same area (the approved proposal was cancelled prior to construction).

Existing infrastructure:

- The area has existing transmission line corridors that connect to the North West Transmission Line upgrades, including Marinus Link.
- The area is adjacent to existing renewable energy facilities, including the neighbouring Granville Harbour Wind Farm and the Reece Hydro Electric Station and Dam. This hub of renewable energy facilities creates efficiencies for transmission and opportunities for downstream industries (e.g. hydrogen production).
- The Reece Hydro Electric Dam (Lake Pieman) provides opportunity for access to a large volume of water for potential future hydrogen production opportunities (excluded from this Project).
- The area has good access to sub-arterial roads with a proven transport route for turbine components from the Port of Burnie to Granville Harbour.
- Existing infrastructure is located throughout the Project Site (including transmission lines, Reece Power Station, access roads and tracks, quarries etc.) and the majority of the site has been previously disturbed by mineral exploration activities. There are multiple existing access tracks throughout the Project Site, including access tracks for transmission infrastructure.

Environmental impacts:

- The location is remote from neighbouring communities, reducing the risk of noise and visual amenity impacts.
- Several avifauna surveys have been completed for the area, with the lowest bird abundance recorded of any wind farm in Tasmania, including the lowest density of wedge-tailed eagles and white-bellied sea eagles of all wind farms currently proposed in Tasmania. Targeted surveys for the orange-bellied parrot have been completed, the results of which suggest that few (if any) orange-bellied parrots migrate beyond 150 m of coastal waters in this area (Nature Advisory, 2023).
- The Project Site is dominated by buttongrass plateaus that are frequently burnt in summer, sodden in winter, and lack burrowable soil to provide habitat for denning, shelter or foraging for Tasmanian devils and spotted-tailed quolls. The homogenous and exposed habitat of the buttongrass plateaus provides low food availability for carnivores (Nature Advisory, 2023).

[1] Capacity factor is the ratio of average energy produced to the theoretical maximum output in a given period.

- The area is dominated by low-lying vegetation (such as moorland and scrub) with limited forest vegetation, meaning minimal tree clearance will be required to facilitate the Project. Micro-siting of the wind turbines will be informed by detailed onsite assessments to ensure potential habitat for threatened species, threatened native vegetation communities and waterways, including the associated riparian areas, are avoided as necessary to ensure the ecological processes and genetic diversity is maintained.

During early feasibility stages, potential constraints were considered and the Project Site was refined to the area of best wind resource with the least environmental and social impact. This refinement also avoided all current mining leases, freehold land, environmentally sensitive land and populated areas. This process is ongoing as infrastructure elements are finalised and adjusted to ensure continual improvement and lowest impact based on further site assessment and design refinement, expected as part of the normal project development phase.

The Project is aligned with the TRET, which aims to double the state's renewable energy production and reach 200% of current electricity needs by 2040. The plans for Tasmania include expanding the renewable energy export capacity through development of an additional 1,500 MW interconnector (Marinus Link) to mainland Australia and the development of new industries that will use renewable energy within the state.

The Integrated System Plan (which is recognised by the Tasmanian Renewable Energy Coordination Framework) identifies four REZs for Tasmania (AEMO, 2022). The Project Site is located within the North West REZ. The Tasmanian Government has identified an additional 5,150 MW of renewable energy to be developed in the North West REZ (DSG, 2021). The Tasmanian Government has also identified the future industrial development of hydrogen in the north-west by delivering the Tasmanian Renewable Hydrogen Action Plan (Department of State Growth, 2020). A primary goal of this action plan is to see Tasmania use the advantage of renewable energy generation to become a domestic consumer and global exporter of green hydrogen.

The Project will directly contribute to these key government initiatives by:

- Delivering approximately 3,000 MW of renewable energy generated in the North West Tasmania REZ, built in stages to align with Tasmania's transmission upgrades and growing green hydrogen demand.
- Providing large-scale and cost-competitive renewable energy to attract hydrogen and future industries into the state.

The Project has set a timeline to prioritise delivery aligned with the 2030 and 2040 energy targets, with renewable energy production commencing in the next five years and increasing to meet targets within the next 10 years.

2 Statement of eligibility

This section addresses the requirements of 60F(1)(l) of LUPAA.

The Project is the largest proposed wind farm in Tasmania and will meet Tasmania's renewable energy targets through the generation of approximately 3,000 MW of renewable energy, with an estimated contribution of approximately 13,140 GW/hour per year[2]. The Project represents an approximate $5 billion CAPEX investment in the north-west region and is expected to create up to 170 FTE employment opportunities during construction of the first stage, and ongoing employment opportunities during operation and construction of subsequent project stages. The scale of the Project will facilitate future development of the renewable energy industry in the region to allow the benefits of the wind resource to be fully captured.

2.1 Eligibility criteria

Section 60M of LUPAA sets out the eligibility criteria for a project to be declared a major project as follows.

1. *Subject to section 60N, a project is eligible to be declared to be a major project under section 60O if, in the opinion of the Minister, the project has 2 or more of the following attributes:*
    a. *the project will have a significant impact on, or make a significant contribution to, a region's economy, environment or social fabric*
    b. *the project is of strategic importance to a region;*
    c. *the project is of significant scale and complexity.*
2. *For the purposes of subsection (1)(c) , in determining whether the project is of significant scale and complexity, the Minister is to consider –*
    a. *the following matters:*
        i. *the number of municipal areas that will be affected by the project or that contain land on which all or part of the project may be situated;*
        ii. *whether 2 or more project-related permits would be required to be obtained in order for the project to proceed;*
        iii. *the technical requirements of the project; and*
    b. *whether the activities that are proposed to be carried out on the land after the construction phase of the project is completed are of interest to, or for the benefit of, a wider sector of the public than resides in the municipal area, or municipal areas, in which the project is to be situated.*
3. *The Minister may not form an opinion in relation to a project under subsection (1) until he or she has considered the advice, if any, provided under section 60I(3) in relation to the project.*
4. *A project that is to be situated on an area of land may be declared to be a major project even though a use or development that is proposed to form part of the project is prohibited under a relevant planning scheme.*

The Project is considered to satisfy the three eligibility criteria. Statements as to why the Minister ought to be of the opinion that the Project is eligible under 60M of LUPAA are provided for each of the criteria below.

2.1.1 The Project will have a significant impact on, or make a significant contribution to, a region's economy, environment or social fabric

The Project has the potential to substantially lift and change the economic outlook of the north-west region. A high-level economic review of the Project and its importance to the north-west economy was undertaken by SGS Economics and Planning, which demonstrates the economic significance of the Project (SGS Economics & Planning, 2023).

[2] Annual GW/hour estimation is based on a capacity factor of 50%.

The estimated capital expenditure for the Project is $5 billion. Operational expenditure is estimated at $20.2 billion, representing an average of close to $673 million per annum (assuming an initial 30 years project life) (SGS Economics & Planning, 2023).

The Project will be delivered in stages, with the first stage (288 MW) estimated to have a capital expenditure of $550 million over two years of construction. The first stage of the Project will create approximately 170 FTE positions during construction and 16 FTE positions per annum during operation.

Subsequent project stages will generate additional construction and operational positions. As subsequent stages are likely to be larger than the first, the construction workforce is also expected to be larger. SGS has estimated the construction workforce for subsequent stages is likely to be double that of the first stage (i.e. >340 FTE positions), which may be expected to unfold over an anticipated 10-year construction period. The full-scale Project is estimated to generate 160 FTE positions per annum during operation.

Investment and employment opportunities generated by the Project are expected to have economic flow-on effects to the region (SGS Economics & Planning, 2023). The economic significance of the Project is therefore greater than the direct economic impacts outlined above.

As the Project will be located on Crown land, operation of the wind farm will generate a lease revenue stream for the State Government and will contribute to the Tasmanian economy.

Eight regional councils, as members of the Cradle Coast Authority, consider the Project to be of significance to the region.

Summary of eligibility in accordance with Section 60M(1)(a) -

Eligibility criteria	Statement as to why the Minister ought to be of the opinion that the project is eligible
The project will have a significant impact on, or make a significant contribution to, a region's economy, environment or social fabric	• $5 billion CAPEX • ~170 FTE (construction) and ~16 FTE (operation) (during first stage) • Flow on economic effects in the north-west • Lease revenue for the State Government • Cradle Coast Authority consider the Project to be of significance to the region.

2.1.2 The Project is of strategic importance to a region

At a state level, the Project will support Tasmania's strategic objectives under the Tasmanian Renewable Energy Action Plan and facilitate the Tasmanian Renewable Hydrogen Action Plan via provision of renewable energy for future hydrogen opportunities.

The Project will generate enough renewable energy to achieve the TRET of 200% renewable energy by 2040 (which equates to additional generation of 10,500 GWh). The Project will have a capacity of up to 3 GW, which, with a capacity factor of up to 50%, equates to 13,250 GWh per annum. A future opportunity arising from the Project is the development of renewable hydrogen production and efuel facilities, which will require low-cost renewable energy. In this way, the Project facilitates the development of renewable hydrogen production facilities, which will contribute to Tasmania's aim to become a significant global supplier of renewable hydrogen for export and domestic use by 2030.

At a regional level, the Project is of strategic importance to the north-west region, as it will provide diversification of the economy (which is currently dominated by three sectors, collectively accounting for 44% of the total income) (SGS Economics & Planning, 2023). The scale of the Project will create opportunities for further investment in the north-west region, through the development of industries involved in the renewable energy supply chain and attracting green industries that require a reliable, low-cost renewable energy source. The scale of the Project also creates a potential opportunity to support Tasmanian Government housing and community infrastructure objectives for the west coast region through partnerships with WRE. The Project supports the viability of North West Transmission upgrades and Marinus Link, which will facilitate Australia's transition to renewable energy.

Summary of eligibility in accordance with Section 60M(1)(b)

The project is of strategic importance to a region	• Contribution to the 200% TRET and Renewable Hydrogen Action Plan. • Opportunities for development of renewable energy and green industries in the north-west. • Opportunities to support housing and community infrastructure objectives. • Support for the North West Transmission upgrades and Marinus Link.

2.1.3 The Project is of significant scale and complexity

The Project is of significant scale being the largest wind farm currently proposed in Tasmania, and larger than any existing wind farm in Australia. The Project extends across multiple land tenures, predominantly within regional reserves and covering some areas of unallocated Crown land, future potential production forest land and permanent timber production zone land. Due to the size of the Project and it being located on Crown land, the Project will be of interest to, or for the benefit of, a wider sector of the public than resides in the West Coast Council municipal area, in which the Project is to be situated.

The Project will be subject to several different approval requirements. In addition to the Project requiring approval through the Tasmania Parks and Wildlife Service reserve activity assessment process, the Project will require assessment and permits under one or more of the following Acts: *Land Use Planning and Approvals Act 1993*, *Threatened Species Protection Act 1995*, *Aboriginal Heritage Act 1975*, *Nature Conservation Act 2002*, *Crown Lands Act 1976*, and *Environmental Management and Pollution Control Act 1994*. Consequently, the Project will require a multitude of assessments for several complex issues involving environmental, health, economic, social and Aboriginal cultural heritage impacts. These include key considerations such as natural values impacts and the convergence between mineral extraction and renewable energy.

Summary of eligibility in accordance with Section 60M(1)(c)

The project is of significant scale and complexity	• Largest wind farm in Tasmania • Multiple land tenures affected. • Multiple assessment and approvals required.

2.2 Ineligibility criteria

Section 60N of LUPAA sets out ineligibility criteria when a project cannot be declared a major project, as follows:

1. *Despite section 60M, a project is not eligible to be declared to be a major project under section 60O if the project –*
   a) *would not further the objectives specified in Schedule 1; or*
   b) *would be in contravention of a State Policy; or*
   c) *would be in contravention of the TPPs; or*
   d) *would be inconsistent with a regional land use strategy that applies to the land on which the project is to be situated.*
2. *Despite section 60M, a project is not eligible to be declared to be a major project under section 60O if the project –*
   a) *relates to a matter, or includes a use or development, referred to in section 11(3) ; or*
   b) *relates to a matter, or includes a use or development, that is an EL activity within the meaning of the EMPC Act.*

A summary of the responses to each of the ineligibility criteria is provided in Table 2.

Table 2 Response to ineligibility criteria

	Ineligibility criteria	Response
1	**Despite section 60M, a project is not eligible to be declared to be a major project under section 60O if the project –**	
a	*would not further the objectives specified in Schedule 1*	Schedule 1 of LUPAA outlines the objectives of the Resource Management and Planning System (RMPS) of Tasmania (under Part 1) and of the planning process established by the Act (under Part 2). A review of the Project against these objectives is provided in Section 8.1.5. The review demonstrates that the Project will further these objectives.
b	*would be in contravention of a State Policy*	State Policies are made under the *State Policies and Projects Act 1993* and seek to further the objectives of the RMPS. The State Policies that are currently operational in Tasmania are: • *State Policy on the Protection of Agricultural Land 2009* • *State Coastal Policy 1996* • *State Policy on Water Quality Management 1997.* The Project does not contravene any of the above State Policies as demonstrated in Section 8.1.4.
c	*would be in contravention of the TPPs*	A review of the Tasmanian Planning Policies (TPPs), including the Renewable Energy TPP, is provided in Section 8.1.4. Subject to further detailed assessments, the Project is considered consistent with the Renewable Energy TPP.
d	*would be inconsistent with a regional land use strategy that applies to the land on which the project is to be situated*	A review of the Project against the Cradle Coast Regional Land Use Strategy (CCRLUS) is provided in Section 8.1.3. Subject to the more detailed onsite assessments, the Project is considered consistent with the CCRLUS.
2	**Despite section 60M, a project is not eligible to be declared to be a major project under section 60O if the project –**	
a	*relates to a matter, or includes a use or development, referred to in section 11(3)*	The Project does not relate to a matter, or include a use or development, referred to in section 11(3) of LUPAA.
b	*relates to a matter, or includes a use or development, that is an EL activity within the meaning of the EMPC Act.*	The Project does not relate to a matter, or include a use or development, that is an EL activity within the meaning of the EMPC Act.

3 Project description

This section addresses the requirements of 60F(1)(d) and (e) of LUPAA.

3.1 Overview

The Project includes the development of up to 500 WTGs, with a projected generating capacity of approximately 3,000 MW. The Project Site is approximately 40,500 ha in size and lies in the central west coast region of Tasmania between Granville Harbour and Zeehan (see Figure 1).

The Project will involve construction of collector substations and the installation of overhead and underground transmission lines within the Project Site to connect the Project to the existing Farrell-Reece 220 kV transmission line. There is currently sufficient capacity on the existing Farrell-Reece transmission line to distribute the expected electricity output from the first stage of the Project (288 MW) to the national energy market (the proponent has completed the Connection Enquiry with TasNetworks on this matter) (TasNetworks, 2022). The proponent has completed studies that would facilitate additional transmission for future stages as required. Further discussion of the Project staging and future transmission augmentation requirements is provided in Section 3.1.3.

A network of access roads within the Project Site will be developed (using existing access routes where possible). Other ancillary infrastructure required for the Project includes office and workshop facilities. The Project has a proposed design life of approximately 30 years, but it can be extended beyond this period with equipment upgrades.

Section 60Q of LUPAA requires a declaration for a major project to include specific information. This includes a general description of the activities that are proposed to be carried out after construction phase of the Project is complete and the proposed uses or developments that are proposed to occur in relation to the Project (see subclauses 60Q(1) and 60Q(2)). This information has been summarised in Table 3 for ease of reference. More detailed information on Project components and construction is provided in the following sections for context and to inform the process of establishing Assessment Criteria.

Table 3 General description of the Project in accordance with section 60Q(1)(b) and (2)(a) of LUPAA

The activities that are proposed to be carried out as part of the Project after the construction phase of the Project is completed.	The Project entails a wind farm consisting of up to 500 WTGs with a projected generating capacity of approximately 3,000 MW, to be constructed over several stages to meet electricity demand and transmission capacity. Supporting infrastructure will include, but is not limited to, underground and overhead cables, collector substations, hardstand areas, internal roads, site office and workshop, and connection into the Tasmanian transmission network. The wind farm and all associated infrastructure will be maintained for the life of the assets and fully decommissioned and rehabilitated at the end of its practical life.
The proposed uses or developments that are proposed to occur in relation to the project.	The Project falls within the use class of Utilities (electricity generation). All other uses on the site are directly associated with and a subservient part of the Utilities use class. Temporary development on the Project Site, to facilitate the construction of each stage of the wind farm, will include a construction compound (or potentially several separate compounds) including a site office, crib room, toilets, workshop, vehicle washdown facilities, bunded refuelling facilities, laydown areas and parking. If suitable, temporary, onsite quarries to facilitate the construction of the Project will be established together with onsite concrete batching at mobile batching plants within the Project Site.

3.1.1 Turbine exclusion zones

The site selection for the Project involved identifying indicative turbine exclusion zones within the Project Site. The turbine exclusion zones are areas that are excluded from the development of WTGs due to the potential constraints outlined in Table 4. These zones may contain ancillary linear infrastructure such as

access tracks. The turbine exclusion zones have been based on a desktop assessment of potential constraints as well as baseline surveys where already completed. Turbine exclusion zones will be refined as more detailed investigations are undertaken during the impact assessment phase of the Project. An indicative plan of the Project Site, including the proposed turbine exclusion zones, is provided in Figure 2.

Table 4 Criteria for turbine exclusion zones

Potential constraint	Turbine exclusion zone criteria
Slope	Terrain steeper than 20° has been excluded from the development of turbines. It is likely turbines will be developed on areas of up to 15°. Further engineering studies and ground truthing to be undertaken.
Coastal exclusions for orange-bellied parrot migration	Areas within 1,500 m of the coastline have been excluded from the turbine development area. Orange-bellied parrots migrate along the west coast of Tasmania (Nature Advisory, 2021).
Vegetation communities	All vegetation communities containing forest have been excluded from the turbine development area. No clearing of trees is anticipated for turbine construction. Further flora studies will be undertaken to confirm desktop vegetation classifications and to understand and avoid threatened flora and habitat for threatened fauna where possible. Some clearing of forest vegetation will be required for ancillary infrastructure such as cables and roads. This will be minimised during the design and engineering stage with further surveys undertaken to avoid and minimise impact.
Sensitive receptors	A 3,000 m turbine exclusion zone has been set for any dwellings located at Trial Harbour and Zeehan. A 1,000 m turbine exclusion zone has been set for shacks located at Granville Harbour.
Hydrological	Turbine exclusions have been established around waterways to exclude turbines by at least 60 m from the banks of waterways. Further studies will be undertaken to confirm waterways and any potential creek crossings by ancillary infrastructure such as cables and roads.
Existing roads	Turbine exclusion zones have been set at 110 m away from Heemskirk Road and Pieman Road.
Existing transmission	A 250 m turbine exclusion zone has been set from existing transmission.
Boundary	Areas within 100 m of the boundaries of the Project Site have been excluded from turbine development area.
Additional exclusion zones will be established during the impact assessment phase of the Project as further studies and consultation determine areas that require protection from development (e.g. areas of significant value for Aboriginal heritage, threatened species habitat etc.).	

Project Site (the Land)

West Coast municipal area

Municipal area boundaries

Town / Community

State road

Secondary road

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Revision	V6
Date	2 October 2023
Paper size	A3

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Whaleback Ridge Renewable Energy Project

Figure 1
Project site location and overview

Project Site (the Land)

Waterbody / watercourse

Town / Community

3 km buffer from town / community

EXISTING INFRASTRUCTURE

MetMast

State road

Secondary road

Reece-Farrell transmission line

PROPOSED INFRASTRUCTURE

Turbine exclusion zone

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Whaleback Ridge Renewable Energy Project

Figure 2
Indicative plan of the Project Site

3.1.2 Project scale

The significant scale of the Project presents several opportunities, including environmental, economic and social benefits.

From an environmental perspective, the size of the Project Site allows for flexibility in the design to avoid sensitive areas and minimise impacts. This is demonstrated by the establishment of WTG exclusion zones, as discussed in Section 3.1.1. Further refinement will be achieved through siting of ancillary infrastructure (such as roads, transmission routes) and the design of the final construction footprint, which will focus on minimal impact where possible. The resulting operational footprint will be an optimised layout within the Project Site, and is expected to be less than 500 ha or approximately 1% of the size of the overall Project Site, as illustrated in Figure 3.

As the technology progresses and improves (resulting in greater generating capacity per WTG), the number of WTGs will be reduced, further reducing the footprint and associated impacts of the Project. The construction footprints for the WTGs are also expected to reduce as self-hoist construction technology improves.

As highlighted previously, the scale of the Project creates economies of scale, making opportunities for on island development of industries involved in the renewable energy supply chain and attracting green industries to the region that require reliable, low-cost renewable energy.

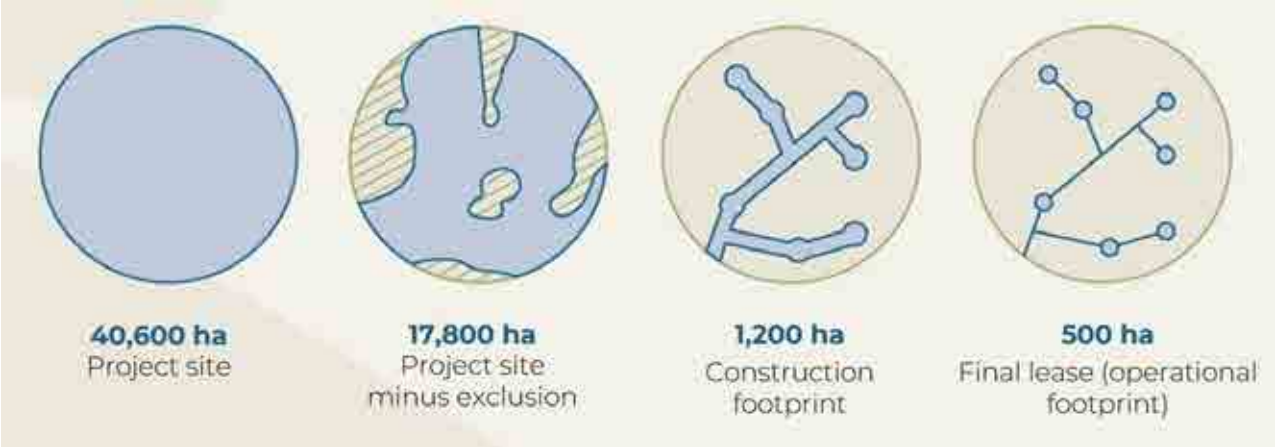


Figure 3 Conceptual representation of Project Site scale and the final operational footprint (areas are approximate)

3.1.3 Project staging

The Project will be constructed and commissioned in stages to meet growing electricity demand and available transmission capacity.

The first stage is anticipated to be 288 MW (representing two separate 144 MW connections into the Tasmanian transmission network). Depending on the final WTG model selected, this first stage could see the construction of 30–50 WTGs plus transmission and site management infrastructure. Currently there is available capacity on the existing transmission network (via the Farrell-Reece transmission line) to accommodate the first stage (TasNetworks, 2022).

As the market demand increases and the wind farm stages progress, additional transmission capacity will be required to export electricity from the site, or opportunities may arise to use the generated electricity in the local region (such as the establishment of a hydrogen production facility, or the use of power at nearby mineral processing facilities). The timing and size of subsequent stages of the Project are currently in development and will be influenced by market demand. Similarly, future transmission requirements will depend on the requirements and location(s) of the end user(s) of the energy generated by the Project. A Transmission Corridors Options Study has been completed for the Project, which considers future transmission augmentation (TasNetworks, 2022).

Any future opportunities for transmission augmentation will be subject to separate approvals. Further analysis of timing will be provided in the next stage of assessment. Importantly, by seeking approval for the

entire wind farm at the outset, the proponent provides a holistic view of the expected eventual scale of the Project and ensures cumulative impacts of each wind farm stage are assessed as one.

3.2 Wind turbine generators

The Project will involve the development of up to 500 WTGs across the Project Site, with a projected generating capacity of approximately 3,000 MW. While the final WTG model is yet to be determined, it is anticipated that each WTG will be capable of generating 5–12 MW of power. The blade tip height of WTGs will be determined as part of the impact studies; the current technology is 250 m high, but this may change during the impact studies.

Table 5 provides an indication of the anticipated parameters of the WTGs, noting this information is indicative only and may change during the design process. The components of a typical WTG are shown in Figure 4.

WTGs will likely be installed on a concrete foundation (final engineering design will confirm design requirements) and will require a permanent hardstand to enable access to, and ongoing maintenance of, the WTG. The construction disturbance footprint for each WTG is expected to be approximately 1 ha, to accommodate turbine footing, crane pads and laydowns. The disturbance area will be reduced to less than 0.5 ha per WTG during operation.

The layout of WTGs across the site will be influenced by the available wind resource and the avoidance of environmental, Aboriginal cultural, historic heritage, social and scenic values, and constraints to be identified through site surveys and associated studies.

As part of the wind farm design process, turbine exclusion zones have been established within the Project Site to delineate suitable setbacks from known sensitive receivers and avoid potential site constraints (see Figure 2 and Table 4). As site surveys are completed, the turbine exclusion zones and associated layout will be further developed to avoid environmental and other sensitivities wherever possible.

Table 5 Indicative WTG parameters

Component	Indicative component range*
Generation capacity (per WTG)	5–12 MW
Estimated tip height	250 m
Diameter of rotor swept area	170 m
Blade length	84 m
Hub height	162 m
Ground disturbance during construction (per WTG)	1 ha
Ground disturbance post-construction (per WTG)	0.5 ha

*The indicative component range values detailed in Table 5 are indicative only and will be determined during the impact assessment phase.

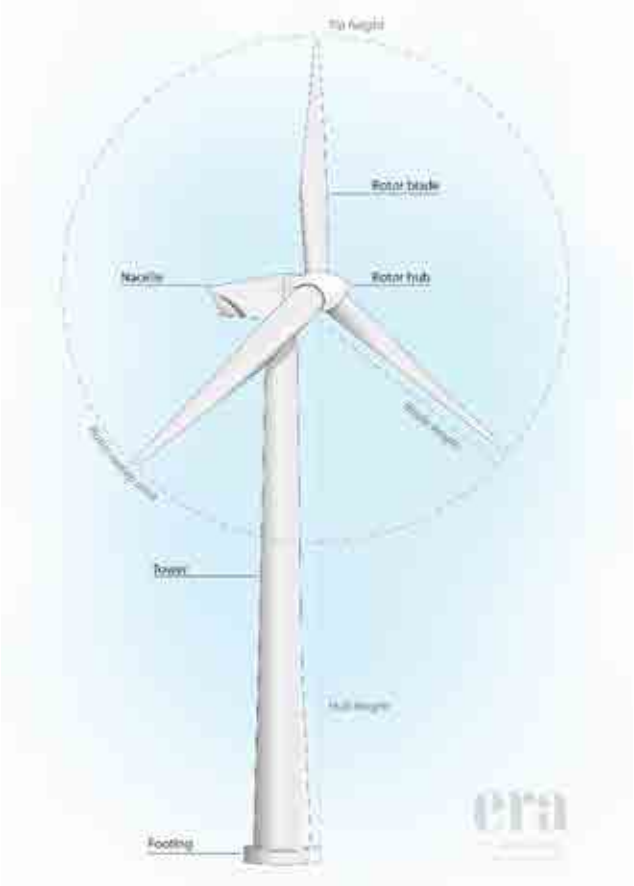


Figure 4 Components of a typical WTG

3.3 Electrical infrastructure and connection

Power generated from the WTGs will be collected and distributed within the site via a network of underground and overhead cables and collector substations. Data links are also included in this network.

Each WTG will connect to a buried electrical transmission cable which will be installed in a trench, alongside access roads, where possible, to minimise the extent of disturbance. Cable routes will be selected to run in circuits between turbines to collector points and into collector substations. Cables will generally be trenched to a depth of approximately 750 mm. The location of the cable routes will be determined once WTG locations have been selected for the lowest environmental impact where possible. Underground cable trenches will only result in temporary disturbances to the land during the construction phase of the Project as they will be backfilled and rehabilitated prior to wind farm commissioning.

The underground cable network will culminate at collector substation sites. The collector substations will convert the incoming voltage to one suitable for connection into the transmission network. The substations will contain a variety of electrical infrastructure placed on earthed concrete and gravel hardstands. The number, size and location of substations has not been finalised but will be determined during the investigation and design phase of the Project.

The collector substations will connect through overhead transmission lines to a new switching substation(s), which will in turn connect to the existing Farrell-Reece 220 kV transmission line that runs east–west through the northern part of the Project Site. There is currently sufficient capacity on the existing Farrell-Reece transmission line to distribute the expected electricity output from the first stage of the Project (288 MW) to the Tasmanian and national energy market (the proponent has completed the Connection Enquiry with TasNetworks on this matter). As market demand increases and the wind farm stages progress, additional transmission capacity will be required to export electricity from the site, or local opportunities may arise to use the generated electricity in the local region (such as the establishment of a hydrogen production facility, or the use of power at nearby mineral processing facilities).

As outlined in Section 1.4, the proponent is currently implementing a feasibility study (co-funded by the Commonwealth) related to hydrogen production and associated infrastructure upgrades in the north-west, including transmission. The outcomes of this study, as well as ongoing discussions with TasNetworks and potential electricity customers, will inform the likely end use for the ultimate electricity generation potential of the site and will dictate the necessary transmission upgrades needed. Accordingly, this MPP includes only the wind farm itself (with a projected generating capacity of approximately 3,000 MW) and ancillary infrastructure, including connection into the existing Farrell-Reece transmission line (within the Project Site). Any future opportunity for local industry (e.g. hydrogen production) or transmission augmentation to transport electricity from the site, will be subject to separate approvals.

3.4 Access roads

Access roads will be developed in the Project Site, connecting to each of the WTGs to facilitate construction access for oversized construction materials and to provide operational phase access for maintenance. Existing access roads across the Project Site will be used and upgraded for the Project as far as practicable. Where the existing access road network is insufficient, additional internal access roads will be constructed.

The road network will remain for the life of the wind farm and be maintained throughout the operational phase of the Project to enable ongoing operational and maintenance activities at each WTG. The road network will be made available to other land users as appropriate, including ongoing site access for existing and future use rights.

3.5 Workshop and office facilities

Permanent site office and workshop facilities will be constructed within the Project Site to facilitate ongoing operation and maintenance of the site. This will include site offices, kitchen, toilets, workshop, storage facilities, washdown bay and hardstand areas for parking. The locations of these facilities are not yet finalised and will be sited to minimise environmental and other impacts.

3.6 Construction overview

Project construction and commissioning is expected to occur in stages to keep pace with the electricity needs and transmission network availability. As noted previously, the first stage is anticipated to be 288 MW (nominally 30–50 WTGs). The first stage is expected to take approximately two years to complete and is likely to involve a construction workforce in the order of 170 FTE positions (SGS Economics & Planning, 2023). The size and timing of subsequent stages are being finalised and will be based on market demand.

Construction compounds will be established and will include facilities such as site offices, crib rooms, toilets, workshop, storage facilities, vehicle washdown facilities, bunded refuelling facilities, laydown areas and parking. Construction activities will include the establishment of the construction compounds, road construction and upgrades, vegetation clearance, ground excavations, construction of hardstand areas, establishment of footings, trenching for cables, onsite assembly laydown and assembly of WTGs, collector substation installation, cable installation, electrical installation, and connection into the existing transmission network.

WTGs, cables and substation components are expected to be manufactured offsite and brought to site for installation by specialist installers.

Significant volumes of aggregate and sand will be required for the construction of footings as well as roads and other hardstands. This material may be sourced from within the Project Site, and geotechnical investigations will be undertaken alongside impact studies to identify suitable resources for construction and aggregate materials. If available material is identified within the Project Site, then onsite quarries may be developed as part of the Project. Alternatively, if material cannot be sourced from within the site, existing or newly developed local and regional quarries may be used (any approvals for offsite quarries are excluded from this MPP and will be addressed separately if required). Onsite concrete batching is expected to occur at mobile batching plants within the Project Site.

Water will be required during the construction phase, largely for concrete mixing. It is anticipated that water will be extracted from Lake Pieman for this purpose; however, further studies are required to confirm water requirements, source and authority for use.

3.7 Ancillary infrastructure

3.7.1 Transport upgrades

Site access will be required during both construction and operation of the Project. The site is currently accessible via public roads, but some road and infrastructure upgrades may be required, particularly to facilitate the delivery of oversize WTG components.

The southern half of the Project Site is accessible from the sealed sub-arterial road C249 (Heemskirk Road). This is a well-established access route and was used for the transportation of construction materials and WTG components for Granville Harbour Wind Farm. The northern half of the Project Site is currently accessible by a local road under the authority of Hydro Tasmania, C252 (Pieman Road). Transport and infrastructure upgrades are likely to be required to facilitate construction access for this northern part of the site.

The proponent will undertake a range of studies to determine the optimal transport route to the site from all available ports. The proponent has been in discussion with TasPorts, TasRail and Hydro Tasmania to discuss possible transportation options and necessary upgrades.

Any road or infrastructure upgrades required outside the Project Site to facilitate construction access are outside the scope of this MPP and will be subject to separate approvals.

3.7.2 Construction workforce accommodation

As outlined in Section 3.6, construction will be undertaken in stages with the first stage (288 MW) expected to take approximately two years to complete and involve a workforce of approximately 170 FTE positions.

The nearest town to the wind farm site is Zeehan. Zeehan currently has a population of approximately 700 people but at times in its history (during peaks in the mining industry) has had much larger populations. In the early mining boom, Zeehan was the third largest town in Tasmania, with a population of approximately 10,000. It is expected the Project will provide growth opportunities for the housing and accommodation market in Zeehan, to provide for both the construction and ongoing operational workforce.

The proponent has strong support from the West Coast Council for the Project (see Appendix A) and will work with the local community and council to anticipate and contribute towards the growth of Zeehan, including long-term additional housing and accommodation. The proponent is participating in a joint working group that includes the Tasmanian Government, Tasmanian Minerals, Manufacturing and Energy Council, Hydro Tasmania and the West Coast Council, to provide long-term sustainable housing to regional communities once the initial needs of construction have been met. Priorities include provision for emergency services worker accommodation, health/ aged care facilities and tourism.

Investigations into workforce accommodation are ongoing and WRE will be considering options both onsite and offsite in nearby towns.

Any development approvals required to facilitate workforce accommodation, in Zeehan or other localities, is outside the scope of this MPP and will be subject to separate approvals.

3.7.3 Workforce capacity and training

Given the size of the expected construction workforce and the current workforce availability in the region, there will likely be a need for capacity building across a range of skills and work roles. The proponent is actively working with existing capacity building initiatives, such as the Energising Tasmania (Skills Tasmania) initiative and Advanced West North West Inc. (AWNW) (see Section 1.2).

The proponent has a strong focus on building the skills and capabilities of locals and Tasmanians first. This will be pursued via training opportunities on the Project itself, but also via the network of local companies who are members of AWNW. Additional opportunities, either led by the proponent or by others, will be an ongoing focus forming part of the community engagement plan for the Project.

3.7.4 Component supply chain

A key opportunity for Tasmania is the potential for local manufacture, fabrication and assembly of wind farm components that have traditionally been imported for other wind farm projects. In this case, the large scale

of the Project presents economies of scale, providing opportunities for other industries to capitalise on manufacture and assembly tasks.

Feasibility studies into supply chain opportunities will be undertaken, and the proponent will work with relevant organisations and agencies to facilitate the opportunities for local manufacture and assembly. Proposals for such manufacturing opportunities are outside the scope of this major project proposal and will be subject to separate approvals.

4 Existing site description

This section addresses the requirements of 60F(1)(f) of LUPAA.

4.1 The Project Site

The Project Site is located on the west coast of Tasmania, to the east of the existing Granville Harbour Wind Farm, around 8 km north-west of Zeehan and 35 km north-west of Queenstown. The closest townships to the Project Site are Trial Harbour to the south (approximately 3 km), Zeehan to the east (approximately 3.5 km), Rosebery to the east (approximately 14 km) and Granville Harbour to the west (approximately 2.5 km) (see Figure 1).The Project Site is approximately 40,500 ha and comprises regional reserves and other types of Crown land, including permanent timber production zone land and future potential production forest land. The final operational footprint of the Project is expected to be under 500 ha.

The Project Site is largely undeveloped and is dominated by buttongrass plateaus classified as moorland, sedgeland and rushland. Other vegetation groups occurring within the Project Site are outlined in the Nature Advisory report (2023), including wet eucalypt forest and woodland (within gullies), rainforest and related scrub (within gullies and lower lying areas), scrub, heathland and coastal complexes (closer to the coast and in gullies), and dry eucalypt forest and woodland (smaller areas on ridges). The Project Site predominantly consists of granite formations with deep drainage lines between the plateaus. There are several rivers, creeks and drainage lines within the Project Site, the most substantive being the large linear water body of Lake Pieman, which bisects the Project Site from north-west to east. Parting Creek Lake lies in the south of the Project Site, north of the township of Zeehan.

The Project Site ranges in elevation, from almost sea level along the western coastline, to over 700 m above sea level at Mount Heemskirk in the south. Whaleback Ridge lies in the north of the Project Site at an elevation of approximately 300–400 m. Mount Livingstone lies immediately north of the Project Site (at an elevation of approximately 780 m).

Heemskirk Road and Pieman Road run through the Project Site, and many existing access tracks for mineral exploration activities run throughout the Project Site as well as tracks used for recreational four-wheel driving and for mountain biking. The Farrell-Reece 220 kV transmission line runs through the northern part of the Project Site, connecting to the Reece Power Station. The existing Granville Harbour Wind Farm is located immediately west of the Project Site.

4.2 Regional context

The west coast of Tasmania is relatively isolated and is starkly different to the more developed northern and eastern regions of the state. The west coast is known for mining and tourism, containing Tasmania's largest mine (the Renison Tin Mine), and iconic tourism offerings such as the Gordon River Cruise. The region contains significant hydro-electric infrastructure, such as the Reece and Lake Margaret power stations, Lake Pieman, Lake Burbury and Lake Mackintosh.

The entire Project Site is within the West Coast local government area (LGA), which recorded a population of 4,263 people in the 2021 Census (ABS, 2021). Population density surrounding the Project Site is low, with a combined population of 1,698 people in the towns of Granville Harbour, Trial Harbour, Zeehan, Rosebery, and Tullah (ABS, 2021). Within the Project Site itself, there are no shacks or dwellings. The population of the West Coast LGA is currently projected to decline by around 1,000 people to 3,252 by 2042 (Department of Treasury and Finance, 2022).

Outside the townships, the West Coast LGA contains limited freehold land. Most of the land south of the Arthur River (which lies in the far north-west of Tasmania) is either reserved (such as the Arthur-Pieman Conservation Area, the Donaldson River Nature Recreation Area, and the Mount Dundas Regional Reserve) or identified as future potential production forest (FPPF), or permanent timber production zone (PTPZ) land.

The Tasmanian Wilderness World Heritage Area (TWWHA) is partially located in the west coast region, and the Project Site is located approximately 25 km west of the TWWHA, separated from it by the West Coast Range and the townships of Queenstown, Zeehan and Rosebery.

The West Coast LGA has a narrow economic base, with three sectors collectively accounting for 44% of total income generated (SGS Economics & Planning, 2023):

- mining
- agriculture, forestry and fishing
- health care and social assistance.

Employment in the mining sector is expected to decline over time (SGS Economics & Planning, 2023). Due to this narrow economic base, the west coast community experiences rolling shocks to employment, and unemployment has ranged from 7% to nearly 12% from 2013 to 2019 (ABS, 2013-2019). While some economic diversification has taken place, most notably in relation to aquaculture and tourism, Tasmania's west coast retains a relatively narrow economic base, and the gross regional output remains dominated by mining. Unemployment is higher (9.6%) than the rest of the state (5.9%) and the median weekly income is lower ($958 per household, compared to $1,358 for Tasmania) (ABS, 2021).

4.3 Land tenure

Land tenure within the Project Site comprises reserves, future potential production forest (Crown), permanent timber production zone land, Hydro-Electric Corporation and Crown land (see Table 6). The Project Site does not include any private freehold land. Further detail on the land tenure is provided in Table 6 below and shown in Figure 5.

Table 6 Project Site land title details

CID[3]	Volume/folio	PID[4]	Management authority	Tenure
1455575	N/A	3388602	NRE Tas (future potential production forest)	Crown land
1455574	N/A	3388370	NRE Tas (future potential production forest)	Crown land
1455583	N/A	3388442	Sustainable Timber Tasmania	Crown land
1127635	N/A	0	Hydro-Electric Corporation	Vested
1456108	N/A	3388290	NRE Tas (future potential production forest)	Crown land
1455580	N/A	3388338	Sustainable Timber Tasmania	Crown land
966965	N/A	0	Hydro-Electric Corporation	Vested
966968	171163/1	3427368	NRE Tas (future potential production forest)	Crown land
1349131		0	Hydro-Electric Corporation	Vested
968819		0	Parks and Wildlife Service	Crown land
1455584		3388477	Sustainable Timber Tasmania	Crown land
1455581		3388346	Sustainable Timber Tasmania	Crown land
968951		0	Parks and Wildlife Service	Crown land
1455585		3388493	Sustainable Timber Tasmania	Crown land
1456104		3388143	NRE Tas (future potential production forest)	Crown land
967017		0	Hydro-Electric Corporation	Vested
968720	120142/1	3388303	Sustainable Timber Tasmania	Crown land
1477485	171164/1	3427392	NRE Tas (future potential production forest)	Crown land
1455578		3388362	Sustainable Timber Tasmania	Crown land

[3] CID means: Cadastral Persistent Identifier – The unique database identifier for each cadastral polygon.
[4] PID means: The unique Property Identification number relating to a (live) current rateable property.

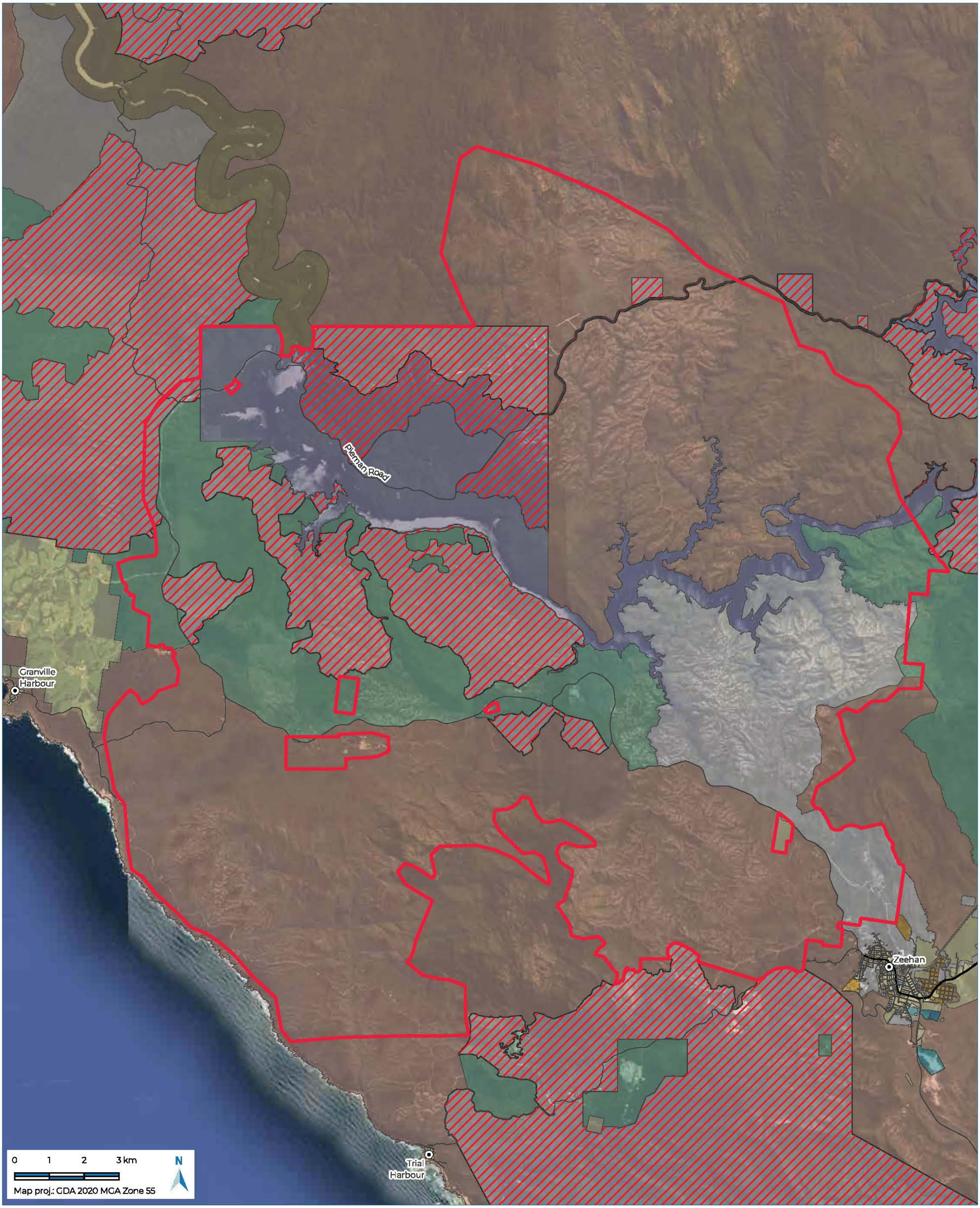
CID[3]	Volume/folio	PID[4]	Management authority	Tenure
967966		0	NRE Tas (Property Services)	Crown land
1455576		3388557	NRE Tas (future potential production forest)	Crown land
992737		0	Parks and Wildlife Service	Crown land
1455564	120142/1	3388370	NRE Tas (future potential production forest)	Crown land
1287673		3388303	Sustainable Timber Tasmania	Crown land
1349132		0	Hydro-Electric Corporation	Vested
968732		0	Parks and Wildlife Service	Crown land
1456103		3388012	Sustainable Timber Tasmania	Crown land
1287740		0	Parks and Wildlife Service	Crown land
968594		3388012	Sustainable Timber Tasmania	Crown land
968781		0	Parks and Wildlife Service	Crown land
1455572		3388311	NRE Tas (future potential production forest)	Crown land
1455573		3388450	NRE Tas (future potential production forest)	Crown land
968906		3388303	Sustainable Timber Tasmania	Crown land
1287670		0	Parks and Wildlife Service	Crown land
968716		3388303	Sustainable Timber Tasmania	Crown land
1349133		0	Hydro-Electric Corporation	Vested
1127634		0	Hydro-Electric Corporation	Vested
970979		0	Parks and Wildlife Service	Crown land
968715		3388303	Sustainable Timber Tasmania	Crown land
968908		0	Parks and Wildlife Service	Crown land
968922		0	NRE Tas (Property Services)	Crown land
1455586		3388303	Sustainable Timber Tasmania	Crown land
1097768		3388303	Sustainable Timber Tasmania	Crown land
970963		3387394	NRE Tas (future potential production forest)	Crown land
968787		3388303	Sustainable Timber Tasmania	Crown land

The reserves within the Project Site are shown in Figure 6 and include:

- Mount Heemskirk Regional Reserve
- Meredith Range Regional Reserve
- Parting Creek Regional Reserve
- Crown land
- Permanent timber production zone land (tenure ID 25514, 28420, 28430 and 25341)
- Future potential production forest (Crown) (tenure ID 37605, 37607 and 37691).

The northern part of the Project Site is situated in the Meredith Range Regional Reserve. The current land reservation is classified as a regional reserve (under the *National Parks and Reserve Management Act 2002*) which provides for both the controlled use of natural resources while protecting the natural and cultural values of the land. The Project is consistent with the objectives of the current reserve classification (see Section 8.2). The Project Site sits within the southern extent of the area nominated for the Tarkine National Heritage Listing (see Section 4.6.1).

Further analysis of the Project's effect on the objectives and purpose of the reserved land is undertaken in Sections 8 and 12 of this MPP.



Project Site (the Land)
Town / Community
State road
Secondary road

LAND TENURE
Authority Crown
Authority Freehold
Casement
Conservation Area
Crown Land
Future Potential Production Forest (Crown)
Future Potential Production Forest (HEC)
Hydro-Electric Corporation
Inland Water
LGA Conservation Area
Local Government
Permanent Timber Production Zone Land
Private Freehold
Public Reserve
Regional Reserve
State Reserve
TasWater

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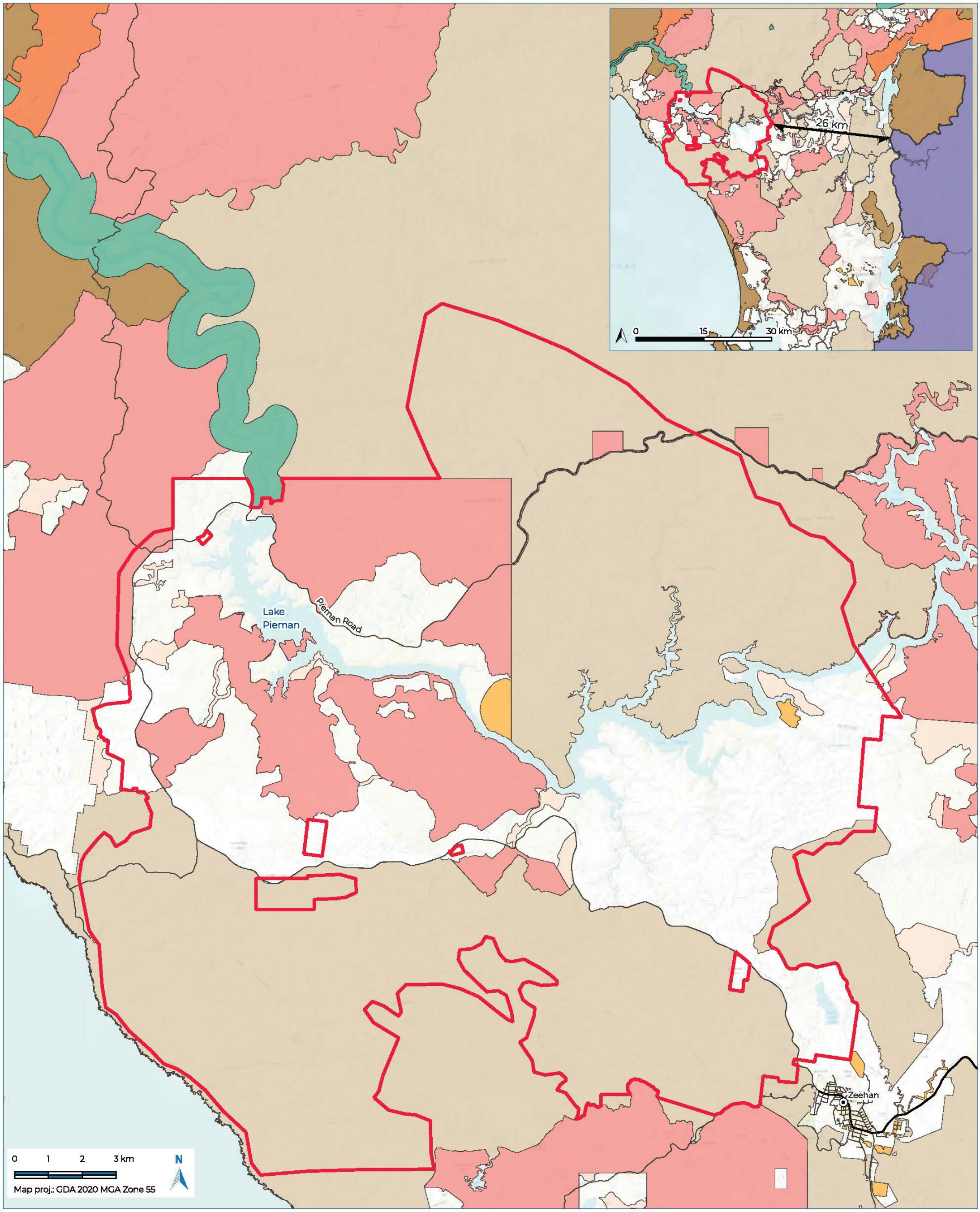
WRE WESTCOAST RENEWABLE ENERGY

Whaleback Ridge Renewable Energy Project

Figure 5
Land tenure within and surrounding the Project Site



Project Site (the Land)
Locality
State road
Secondary road

RESERVES
Conservation Area
Future Potential Production Forest
Informal Reserve on other public land
Informal Reserve on Permanent Timber Production Zone Land or STT managed land
Nature Recreation Area
Regional Reserve
State Reserve
Tasmanian Wilderness World Heritage Area

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Whaleback Ridge Renewable Energy Project

Figure 6
Reserves located within and surrounding the Project Site

4.4 Land use

Existing land uses within the Project Site are shown in Figure 7 and include:

- Mining activities (such as Heemskirk Quarry) and mineral exploration
- Recreational pursuits, including four-wheel driving, firewood collection, mountain bike riding, camping (no permanent camping facilities), boating and fishing on Lake Pieman, and bushwalking
- Electrical infrastructure, including the Reece Power Station and switchyard, Granville Harbour Wind Farm switchyard, Farrell-Reece high voltage transmission line, and local electrical distribution lines for local mines and townships
- Limited beekeeping activities
- Existing roads and access tracks.

The Project Site does not contain any shacks or dwellings.

There are no existing EPA regulated premises within the Project Site, but there are several either surrounded by, or nearby to, the Project Site, as outlined in Table 7. The closest and most relevant EPA regulated premises in proximity to the site are shown in Table 7; however, there are also EPA regulated premises in the broader region, such as the Zeehan wastewater treatment plant and the Zeehan waste depot south-east of Zeehan.

Table 7 EPA regulated premises in proximity to the Project Site (source: the LIST 30 June 2023)

Premises	Category	Regulatory limit	Location
Granville Tin Upgrade	Manufacturing and Mineral Processing	40,000 tonnes per year of raw material processed	Surrounded by Project Site
Granville Harbour Wind Farm	Wind Farm	112 MW of generating capacity	Approximately 500 m west of Project Site
Heemskirk Quarry	Materials Handling	50,000 cubic metres per year of rocks, ores or minerals processed	Surrounded by Project Site
Comstock Mine	Manufacturing and Mineral Processing	200,000 tonnes per year of raw material processed	Approximately 2.7 km south of Project Site
Avebury Mine	Extractive Industries	1,000 tonnes per year of minerals produced	Approximately 3 km south of Project Site
Renison Bell Mine	Manufacturing and Mineral Processing	1,500,000 tonnes per year of raw material processed	Approximately 5 km east of Project Site
Zeehan Zinc project Stage 2, Tasmanian Smelters Site	Materials Handling	140,000 cubic metres per year of rocks, ores or minerals processed	Approximately 4 km south of Project Site
Old Austral Smelter Site	Extractive Industries	50,000 tonnes/year of minerals produced 100,000 tonnes of material in total	Approximately 4 km south of Project Site

No existing mining leases are within the Project Site. The exploration licences affecting the Project Site are outlined below and shown in Figure 8. Consultation has been undertaken with the relevant mineral exploration licence holders and with neighbouring mining companies (see Section 10). The Project has received letters of support from CopperCorp/Georgina Resources and Spero Mining and Bluestone Mines (see Appendix A). Mining companies have also expressed interest in exploring opportunities for future power purchase agreements to use power from the Project.

- EL9/2019 Category 1 Exploration Licence (91 km^2)
    - Ten Star Mining Pty Ltd

    - Grant date June 2021
    - Expiry date June 2026
- L23/2020 Category 1 exploration licence (228 km^2)
    - Georgina Resources Pty Ltd
    - Grant Date Dec 2021
    - Expiry date Dec 2026
- EL18/2021 Category 1 Exploration Licence (39 km^2)
    - Bluestone Mines Tasmania Joint Venture Pty Ltd
    - Grant date Apr 2022
    - Expiry date Apr 2027
- EL21/2005 Category 1 Exploration Licence (65km^2) – only partially encroaches into study area
    - Venture Minerals Limited
    - Grant date Aug 2006
    - Expiry date Aug 2024
- EL2/2018 Category 1 Exploration Licence (93 km^2) – only partially encroaches into study area
    - Georgina Resources Pty Ltd
    - Grant date Aug 2018
    - Expiry date Aug 2023

As outlined in Section 4.1, the Project Site is surrounded by Trial Harbour to the south (approximately 3 km), Zeehan to the east (approximately 3.5 km), Rosebery to the east (approximately 14 km) and Granville Harbour to the west (approximately 2.5 km) (see Figure 2). The nearest residences to the Project Site are approximately 70 m west of the Project Site boundary, near Granville Harbour. The proposed turbine exclusion zones include a 1 km buffer from these residences, which may be increased depending on the outcomes of the impact assessment phase. The 1 km buffer is proposed as a starting point based on the distance of the nearest residence to operational turbines at the Granville Harbour Wind Farm. Noise monitoring for the Granville Harbour Wind Farm has been compliant with the *Environment Protection Policy (Noise) 2009* and there have been no noise complaints reported during operation of that wind farm.

Yellowband Plain
Brown Plains
Lovers Corner
Corinna
Tikkawoppa Plateau
Bernafai Ridge
Reece power station
Pieman Road
Serpentine Ridge
Renison Bell Mine
Granville Harbour
2727 m
Heemskirk Quarry
Granville Mine
1792 m
Zeehan
Comstock Mine
Zeehan Zinc Mine
Avebury Mine
Old Austral Smelter
3343 m
Trial Harbour
66 m
0 50 100 m
0 1 2 3 4 km
N
Map proj.: GDA 2020 MGA Zone 55

Project Site (the Land)
Town / community

EXISTING INFRASTRUCTURE
State road
Secondary road
Access track
Trail
Mountain bike trail (www.Trailforks.com)
Farrell-Reece transmission line
Granville Wind Farm

Existing mine site
Accommodation / residential building
Reece power station

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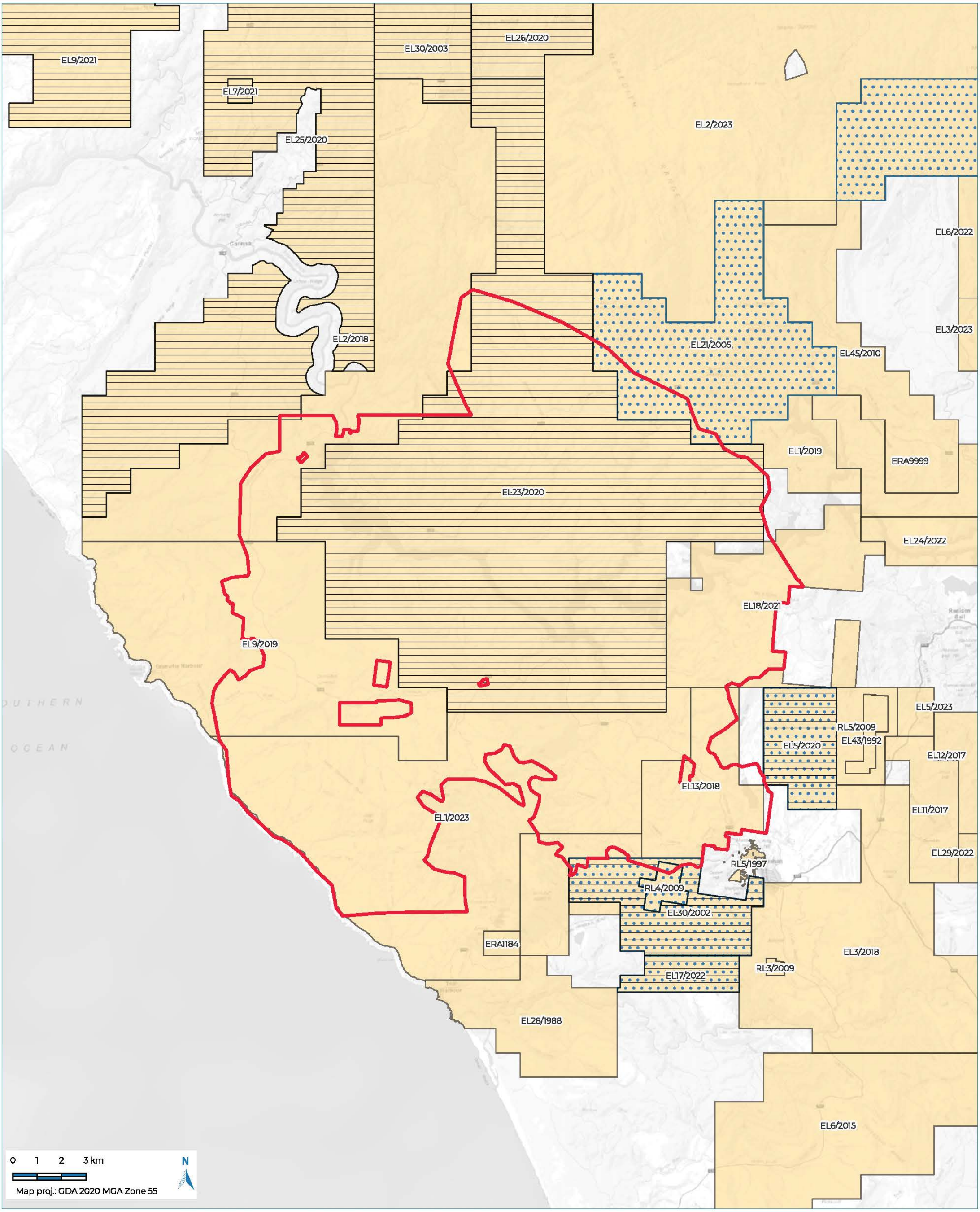
Whaleback Ridge Renewable Energy Project

Figure 7
Existing infrastructure and surrounding land use



Project Site (the Land)

MINING LICENCES

- Licence 1 - Metallic minerals & atomic substances
- Licence 3 - Construction minerals
- Licence 5 - Industrial minerals

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Whaleback Ridge Renewable Energy Project

Figure 8
Mining and exploration licenses

4.5 Ecology

The following ecological assessments have been undertaken for the Project to inform site selection, designation of preliminary turbine exclusion zones, and further investigations that may be required for the Project:

- Whaleback Ridge Renewable Energy Project Desktop Flora and Fauna Assessment (see Appendix B) (Nature Advisory, 2023)
- Whaleback Ridge Renewable Energy Project Bird and Bat Assessments 2021–22 (see Appendix C) (Nature Advisory, 2023)
- Whaleback Ridge Renewable Energy Project Preliminary Searches for Eagle Nests (see Appendix D) (Mooney, N., 2023).

Collectively these assessments have involved field assessments for birds and bats (including bird utilisation surveys, targeted raptor utilisation surveys, bat surveys and a targeted survey for the orange-bellied parrot) and desktop consideration of vegetation communities, threatened flora, terrestrial and aquatic fauna and other ecological values.

The key outcomes of these assessments are summarised below.

4.5.1 Vegetation communities

The Project Site is largely undeveloped and mostly comprises native vegetation. Based on available desktop mapping, the dominant vegetation group within the Project Site is moorland, sedgeland and rushland (including buttongrass plains) (see Figure 9). Other vegetation groups occurring within the Project Site according to desktop research are (Nature Advisory, 2023):

- Wet eucalypt forest and woodland (within gullies)
- Rainforest and related scrub (within gullies and lower lying areas)
- Scrub, heathland and coastal complexes (closer to the coast and in gullies)
- Dry eucalypt forest and woodland (smaller areas on ridges)
- Non eucalypt forest and woodland (one very small area in the north-east)
- Other natural environments (Lake Pieman)
- Modified land (dams, quarries, etc.).

Two threatened native vegetation communities listed under the Tasmanian *Nature Conservation Act 2002* are mapped within the Project Site, namely a small area of *Eucalyptus ovata* forest and woodland in the south, and a small patch of *Melaleuca ericifolia* swamp forest on the shores of Lake Pieman. An additional state threatened native vegetation community (*Banksia marginata* wet scrub) occurs within a 1 km buffer of the Project Site, to the north-east.

Two threatened ecological communities listed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) are identified by Nature Advisory as having the potential to occur within the Project Site, namely:

- Tasmanian Forests and Woodlands dominated by black gum or Brookers gum (*Eucalyptus ovata*/ *E. brookeriana*). This community is critically endangered under the EPBC Act and is associated with the *Eucalyptus ovata* forest and woodland community mapped within the Project Site.
- Tasmanian White Gum (*Eucalyptus viminalis*) Wet Forest. This threatened ecological community is critically endangered under the EPBC Act and has the potential to occur in gullies within the Project Site. However, none of the TASVEG classifications associated with this community are mapped within the Project Site.

4.5.2 Threatened flora

Threatened flora species listed under the *Threatened Species Protection Act 1995* (TSP Act) and/or the EPBC Act identified by Nature Advisory as having the potential to occur within the Project Site are outlined in

Table 8. Five threatened flora species were identified as having the potential to occur[5] within the turbine development areas, three of which have been previously recorded within the Project Site (leafless milkwort, northwest heath and horned orchid). The remaining species (if present) would occur in woodland, heathland, rainforest or scrub habitat within the turbine exclusion zone (Nature Advisory, 2023).

Table 8 Threatened flora species potentially occurring within the Project Site (Nature Advisory, 2023)

Species	Common name	Listing status (TSP Act/EPBC Act)
Potential to occur within the turbine development area		
**Comesperma defoliatum*	Leafless Milkwort	rare/-
**Epacris curtisiae*	Northwest Heath	rare/-
Epacris glabella	Smooth Heath	endangered/Endangered
Micrantheum serpentinum	Western Tridentbush	rare/-
**Orthoceras strictum*	Horned Orchid	rare/-
Potential to occur within turbine exclusion zone		
Amphibromus fluitans	Southern Swamp Wallaby-grass	rare/Vulnerable
Deyeuxia minor	Small Bentgrass	rare/-
Euphrasia amplidens	Pieman Eyebright	endangered/-
Hypolepis distans	Scrambling Groundfern	-/Endangered
Hypolepis muelleri x rugosula	Harsh Ground-fern x Ruddy Ground-fern hybrid	hybrid or intergrade of a threatened species (unofficial)/
Lotus australis	Australian Trefoil	rare/-
Persoonia muelleri subsp. angustifolia	Narrowleaf Geebung	rare/-
Pomaderris intermedia	Lemon dogwood	rare/-

*Denotes species previously recorded within the Project Site based on the Natural Values Atlas Report generated for the Project (11 May 2023).

4.5.3 Threatened fauna

Threatened fauna species that have been identified by Nature Advisory as having the potential to occur within the Project Site are outlined in Table 9.

Nature Advisory further considers which parts of the Project Site these species are most likely to utilise, delineating between habitat values within the turbine development areas (dominated by buttongrass plains) and the turbine exclusion zones (where most of the forested vegetation occurs). Nature Advisory concludes that several species are likely to inhabit the turbine exclusion zones but are less likely to use the turbine development areas, hence reducing their susceptibility to impacts (refer Appendix C for further detail).

[5] Species considered to have the 'potential to occur' are those for which suitable habitat exists or may exist, but recent records are scarce (Nature Advisory, 2023).

Table 9 Threatened fauna species potentially occurring within the Project Site (Nature Advisory, 2023)

Species	Common name	Listing status (TSP Act/EPBC Act)
Birds		
Apus pacificus	Fork-tailed Swift	-/Migratory
**Aquila audax subsp. fleayi*	*Tasmanian Wedge-tailed Eagle	endangered/Endangered
**Accipiter novaehollandiae*	*Grey goshawk	endangered/-
Ceyx azureus subsp. diemenensis	Azure kingfisher (Tasmania)	endangered/Endangered
Gallinago hardwickii	Latham's snipe	-/Migratory
**Haliaeetus leucogaster*	*White-bellied Sea-Eagle	vulnerable/-
**Hirundapus caudacutus*	*White-throated Needletail	-/Vulnerable
Myiagra cyanoleuca	Satin flycatcher	-/Migratory
**Neophema chrysogaster*	*Orange-bellied parrot	endangered/Critically Endangered
**Neophema chrysostoma*	*Blue-winged parrot	-/Vulnerable
Tyto novaehollandiae castanops (Tasmanian population)	Masked owl (Tasmanian)	-/Vulnerable
Mammals		
Dasyurus maculatus maculatus (Tasmanian population)	Spotted-tailed Quoll (Tasmanian population)	rare/Vulnerable
Sarcophilus harrisii	Tasmanian Devil	endangered/Endangered
Fish and invertebrates		
Prototroctes maraena	Australian grayling	vulnerable/Vulnerable
Phrantela marginata	Heazlewood River hydrobiid snail	rare/-
Phrantela conica	Little Henty River hydrobiid snail	rare/-

*Denotes species recorded within the Project Site during the bird utilisation surveys (autumn 2021 and summer 2022), or incidental observations during nest searches (May and June 2022).

The Project Site has been subject to bird utilisation surveys, raptor utilisation surveys, targeted orange-bellied parrot surveys and bat surveys by Nature Advisory (Appendix C) and aerial searches for eagle nests (Appendix D). As a result of these surveys a total of six listed fauna species (all birds[6]) have been recorded from the site, namely:

- Tasmanian wedge-tailed eagle
- white-bellied sea-eagle
- white-throated needletail
- orange-bellied parrot
- blue-winged parrot
- grey goshawk.

[6] Field surveys undertaken to date have focused on birds and bats, hence additional threatened terrestrial or aquatic fauna species may be present on site, but have not yet been subject to field investigation.

Two bird utilisation surveys were undertaken in autumn 2021 and summer 2022 which observed three threatened bird species: white-throated needletail (*Hirundapus caudacutus caudacutus*), Tasmanian wedge-tailed eagle (*Aquila audax fleayi*) and blue-winged parrot (*Neophema chrysostoma*). The bat and bird assessment undertaken for the site by Nature Advisory (see Appendix C) identified a relatively low diversity and density of birds observed within the Project Site.

The white-throated needletail is a trans-equatorial migrant to Tasmania and is present in southern Tasmania for only a short time each year during the non-breeding season. This species was recorded from the site on 10 occasions during the autumn 2021 survey.

The blue-winged parrot was recorded on nine occasions across the autumn 2021 and summer 2022 surveys. Blue-winged parrots breed in the hollow branches of eucalypts in Tasmania, coastal South Australia and southern Victoria. The blue-winged parrot is a partial migrant species, with a variable number of birds migrating from Tasmania to mainland Australia in autumn and winter (DCCEEW, 2023).

A total of 18 Tasmanian wedge-tailed eagle flights were observed during the two bird utilisation surveys, representing a very low utilisation rate compared to other wind farm sites in Tasmania.

In addition to the bird utilisation surveys, baseline searches for the nests of wedge-tailed eagles and white-bellied sea eagles were undertaken across the Project Site and surrounding area (between 3–5 km of the Project Site, depending on the locations of historic nests) in May and June 2022. The nest searches recorded incidental observations of the grey goshawk, wedge-tailed eagle and white-bellied sea eagle. No active eagle nests were observed within the site during aerial eagle nest surveys, which included checking historical nest locations mapped within and adjacent to the site on the Natural Values Atlas (Appendix D). The majority of the Project Site was identified as having very poor potential for wedge-tailed eagle nesting (Mooney, N., 2023). Due to the lack of nests within the study area found during surveys, the very large range of eagles in the western bioregion of Tasmania and the lack of clear pattern of eagle flight paths observed, Nature Advisory concludes that the study area is believed to be inhabited by very few wedge-tailed eagles and is likely to be part of the territory of one pair that is breeding away from the wind farm site (Appendix C).

In addition to the above threatened species, the orange-bellied parrot was recorded on the coastline within the turbine exclusion zone during targeted surveys undertaken on three occasions throughout March 2021 and April 2022. The orange-bellied parrot is a migratory species which breeds in coastal south-west Tasmania and spends the winter in coastal Victoria and South Australia. This is consistent with data collected for Granville Harbour Wind Farm, Heemskirk Wind Farm and the surrounding historical surveys where observations suggest that few if any orange-bellied parrots migrate beyond 150 m from coastal waters along this section of coastline (Appendix C).

Bat surveys recorded calls of six species and two species complexes. All the recorded bat calls were from common, secure and widespread species that occur in farmland and woodland habitats throughout Tasmania (Appendix C).

4.5.4 Weeds and pathogens

There are weeds known to occur along the existing road network, but it is presumed the majority of the Project Site is likely free of major weed infestations.

Phytophthora has been recorded within the Project Site; however, it is expected that the majority of the Project Site is free from Phytophthora (NRE Tas, 2023). Vegetation communities within the Project Site are likely to be vulnerable to this pathogen (Nature Conservation Branch, 2003).

Lake Pieman

Pieman Road

Granville Harbour

Zeehan

Trial Harbour

0 2 4 km

N

Map proj: GDA 2020 MGA Zone 55

- Project Site (the Land)
- Town / Community
- State road
- Secondary road

VEGETATION COMMUNITIES (TASVEG4)

- (DNI) Eucalyptus nitida dry forest and woodland
- (DOB) Eucalyptus obliqua dry forest
- (DOV) Eucalyptus ovata forest and woodland**
- (FPE) Permanent easements
- (FPF) Pteridium esculentum fernland
- (FUM) Extra-urban miscellaneous
- (MBP) Pure buttongrass moorland
- (MBR) Sparse buttongrass moorland on slopes
- (MBS) Buttongrass moorland with emergent shrubs
- (MBU) Buttongrass moorland (undifferentiated)
- (MBW) Western buttongrass moorland
- (MRR) Restionaceae rushland
- (MSW) Western lowland sedgeland
- (NAD) Acacia dealbata forest
- (NAR) Acacia melanoxylon forest on rises
- (NLA) Leptospermum scoparium - Acacia mucronata forest
- (NLL) Leptospermum forest
- (NME) Melaleuca ericifolia swamp forest**
- (OAQ) Water, sea
- (ORO) Lichen lithosere
- (RIP) Lagarostrobos franklinii rainforest and scrub
- (RML) Nothofagus - Leptospermum short rainforest
- (RMS) Nothofagus - Phyllocladus short rainforest
- (RMT) Nothofagus - Atherosperma rainforest
- (SBR) Broad-leaf scrub
- (SCH) Coastal heathland
- (SLL) Leptospermum lanigerum scrub
- (SMR) Melaleuca squarrosa scrub
- (SRF) Leptospermum with rainforest scrub
- (SSC) Coastal scrub
- (SWR) Western regrowth complex
- (SWW) Western wet scrub
- (WNL) Eucalyptus nitida forest over Leptospermum
- (WNR) Eucalyptus nitida forest over rainforest
- (WNU) Eucalyptus nitida wet forest (undifferentiated)
- (WOL) Eucalyptus obliqua forest over Leptospermum
- (WOR) Eucalyptus obliqua forest over rainforest
- (WOU) Eucalyptus obliqua wet forest (undifferentiated)

****denotes listed threatened vegetation community under the Nature Conservation Act 2002.**

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Figure 9
Vegetation communities

4.6 Heritage

4.6.1 Aboriginal history and cultural heritage features

The west coast of Tasmania contains an extremely well documented and rich archaeological landscape and includes some of the oldest dated heritage sites in Tasmania. CHMA Pty Ltd was engaged by WRE to undertake a desktop Aboriginal and historic heritage assessment for the Whaleback Ridge Renewable Energy Project (CHMA, 2023).

As part of Stage 1 of the desktop assessment, a search was carried out of the Aboriginal Heritage Register (AHR) to determine the extent of registered Aboriginal heritage sites within and in the general vicinity of the study area. The search results show that there are a total of eight registered Aboriginal sites that are situated within an approximate 5 km radius of the study area (search results provided by AHT on 10-10-2022). Five of these sites are classified as isolated artefacts and one site is classified as an artefact scatter (AH9162). In addition, there are two Aboriginal shell midden sites (AH2334 and AH9369), with one of these living sites also having stone artefacts in association with the midden deposit (AH9369).

Of these eight registered sites, there are two registered sites that are located within the Project Site. One of these sites is an isolated artefact (AH9348), with the second site classified as an artefact scatter (AH9162). The detailed AHR search results can be found in Section 3.4 of the CHMA report.

The findings of previous archaeological investigations undertaken in the general vicinity, together with the AHR search results, indicate that the most likely site types that will be encountered within the Project Site will be artefact scatters/isolated artefacts and living sites, or a combination thereof. Site densities are likely to be comparatively low. Hut depressions, rock engravings and Aboriginal stone quarries have also been recorded along the coast near Granville Harbour and it is therefore possible, although less likely, that these site types may also be encountered.

In addition to sites of Aboriginal heritage significance there are cultural landscape values associated with the west coast of Tasmania.

The Western Tasmania Aboriginal Cultural Landscape (see Figure 10) is listed in the National Heritage List. The datasheet for the site (Department Climate Change, Energy, the Environment and Water, 2023) states:

> *The Western Tasmania Aboriginal Cultural Landscape represents the best evidence of an Aboriginal economic adaptation which included the development of a semi-sedentary way of life with people moving seasonally up and down the north west coast of Tasmania. This way of life began approximately 1 900 years ago and lasted until the 1830s. Dotted along the wind-swept coastline of the Western Tasmania Cultural Landscape are the remains of numerous hut depressions found in Aboriginal shell middens. These huts and middens are the remnants of an unusual, specialised and more sedentary Aboriginal way of life which was based on the hunting of seals and land mammals, and the gathering of shellfish.*

The Project Site is located approximately 5 km from the Western Tasmania Aboriginal Cultural Landscape area listed in the National Heritage List. Consultation with Aboriginal community groups has commenced and will be ongoing throughout the planning and approvals phase of the Project to understand the effects on cultural landscape values and to ensure impacts are avoided or minimised.

Figure 10 Western Tasmania Aboriginal Cultural Landscape (DCCEEW, 2021)

4.6.2 Historic heritage

A search of several historic registers and databases was undertaken to determine the extent of historic sites and features in the vicinity of the study area.

One heritage listed feature was identified within the Project Site – the Carn Brea Tin Mine, which is mapped within the WTG exclusion area along the west coast. The heritage feature is permanently registered on the Tasmanian Heritage Register.

4.7 Geoconservation

There are seven geoconservation sites mapped within the Project Site (see Figure 11), being:

- Arthur Lineament
- Eureka Dolerite Cone Sheet
- Piney Creek Structural Deformation of Oonah Formation
- Reece Dam Area Blue Amphibole of the Arthur Metamorphic Complex
- Reece Spillway – Whyte Schists
- Western Tasmania Blanket Bogs
- Zeehan Tillite Structures.

These sites vary from small, localised features to large landscape-scale sites (e.g. Western Tasmanian Blanket Bogs) and have varying levels of sensitivity and significance (from district through to global level

significance). Investigations will be undertaken to further characterise the geomorphological features within the site and the Project will be designed to avoid areas of high significance where practicable.

4.8 Contamination

The Project Site overall has a very low risk of prior land contamination. There are, however, pockets with prior mining history (including old exploration tracks, tramways and mineral processing areas) and other human development, that pose some risk of contamination and will be subject to further investigation commensurate with the level of risk.

Arthur Lineament

Reece Dam Area Blue Amphibole of the Arthur Metamorphic Complex

Reece Spillway - White Schists

Pieman Road

Eureka Dolerite Cone Sheet

Granville Harbour

Pine Creek Structural Deformation of Oonah Formation

Zeehan Tillite Structures

Western Tasmania Blanket Bogs

Zeehan

Trial Harbour

0 1 2 3 km

N

Map proj.: GDA 2020 MGA Zone 55

Project Site (the Land)

Town / community

State road

Secondary road

GEOCONSERVATION SITE

- Reece Spillway - Whyte Schists
- Piney Creek Structural Deformation of Oonah Formation
- Reece Dam Area Blue Amphibole of the Arthur Metamorphic Complex
- Zeehan Tillite Structures
- Eureka Dolerite Cone Sheet
- Arthur Lineament
- Western Tasmania Blanket Bogs

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WRE WESTCOAST RENEWABLE ENERGY

Job Number	2122-073
Revision	V.6
Date	2 October 2023
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Whaleback Ridge Renewable Energy Project

Figure 11
Geoconservation sites within the Project Site

5 Potential effects

This section addresses the requirements of 60F(1)(g) and (h) of LUPAA.

Section 60F(1)(h) of LUPAA requires consideration of key environmental, health, economic, social and heritage effects of a project, and section 60F(1)(g) of LUPAA requires specific consideration of anticipated effects on other areas of land that are in the vicinity of the areas of land on which a project is to be situated.

The following sections consider key environmental, health, economic, social and heritage effects both on the Project Site and, where relevant, in the local and broader region, thus addressing both relevant sections of LUPAA together.

5.1 Ecological effects

5.1.1 Avifauna

As outlined in Section 4.5.3, overall bird utilisation at the Project Site is relatively low, compared to other wind farm sites in Tasmania and Australia. Six threatened bird species were identified within the Project Site during the bird utilisation surveys and incidental observations during the nest searches, being:

- Tasmanian wedge-tailed eagle
- white-bellied sea eagle
- white-throated needletail
- orange-bellied parrot
- blue-winged parrot
- grey goshawk.

The Project has the potential to impact upon avifauna through direct habitat loss (clearance for WTGs and ancillary infrastructure) and through collision of birds with operating WTGs.

No active nesting sites for any of the threatened species were identified within the Project Site (Nature Advisory, 2023) (Mooney, N., 2023). Aerial nest surveys for eagles (in May and June 2022) did not identify any active nests within the site, and these surveys included checking of historical raptor nest locations mapped within and adjacent to the site on the Natural Values Atlas. The Project will be developed to avoid clearance of large (and hence potential nesting) trees, hence the risk of impact to potential raptor breeding habitat is also considered to be low (Nature Advisory, 2023). The white-throated needletail breeds in the northern hemisphere and migrates to Australia during its non-breeding season. The orange-bellied parrot breeds in south-west Tasmania, with the only significant breeding population in Tasmania located within 20 kilometres of Melaleuca, which lies over 180 km south of the Project Site (see Appendix C). Blue-winged parrots breed in the hollow branches of eucalypts in Tasmania, coastal South Australia, and southern Victoria. Overall, the Project may result in the loss of some foraging habitat for threatened avifauna but the risk to breeding habitat for the threatened avifauna identified is considered to be very low (Nature Advisory, 2023).

The Project also has the potential to impact upon avifauna through collision with WTGs. This risk will be further investigated and quantified during the assessment phase, but given the relatively low abundance of threatened avifauna recorded onsite to date, the known collision risks for each species, and the turbine exclusion zones proposed (including a 1.5 km buffer from the coastline), Nature Advisory concludes that the overall risk of collision is expected to be relatively low (Nature Advisory, 2023). Consideration of the potential risk to each identified listed avifauna species is provided in Appendix C and summarised below.

The recorded Tasmanian wedge-tailed eagle utilisation of the site is considered to be very low, particularly in comparison to other wind farm sites in Tasmania. A total of 18 Tasmanian wedge-tailed eagle flights were observed during the two survey events, and Nature Advisory concludes that the study area is believed to be inhabited by very few wedge-tailed eagles and is likely to be part of the territory of one pair that is breeding away from the wind farm site (Nature Advisory, 2023). Further consideration of eagle collision risk will be undertaken during the impact assessment phase, but early indications suggest the Project poses a

relatively low risk to the species, particularly in comparison to other wind farm sites in Tasmania (Nature Advisory, 2023).

White-throated needletails were observed within the site on 10 occasions during the formal autumn 2021 survey, and two additional bird sightings were recorded incidentally outside the wind farm site during summer 2022. White-throated needletail mortality from collisions with WTGs in Australia is known to occur, although is a low severity threat (Nature Advisory, 2023). Based on the available data at this time, Nature Advisory concludes the overall collision risk for the species is low; however, further consideration of this risk will be made during the assessment phase (Nature Advisory, 2023).

Targeted orange-bellied parrot surveys have been completed during March 2021 and April 2022 along the coastal section of the Project Site and up to 5 km inland along the coastal section. One orange-bellied parrot was recorded along the coastal boundary of the site (approximately 35 m from the coast) during the Nature Advisory surveys (Appendix C). The coastal margins of the site are within the known migratory route for the species; however, there is little evidence of significant numbers of the species moving inland during their migration along this part of the western Tasmanian coastline. The turbine exclusion zone for the Project includes land within 1.5 km of the coast. With this exclusion zone in place, the potential for impact to the species is considered to be low (Nature Advisory, 2023).

The blue-winged parrot was recorded within the Project Site in low numbers, with six individuals recorded during autumn 2021 and three during summer 2022 (Nature Advisory, 2023). When crossing open land, this species generally moves in small flocks at heights below 30 m. Further consideration of the collision risk for this species will be undertaken during the assessment phase.

5.1.2 Terrestrial ecology

The potential effects of the Project on terrestrial ecology include direct impacts (i.e. clearance of native vegetation and habitat loss) and indirect impacts associated with the construction, operation and decommissioning of the Project.

Clearance of native vegetation will be required for the Project, with the final operational footprint comprising a small subset of the Project Site (under approximately 500 ha). The operational footprint will include temporary disturbance areas during construction (e.g. construction laydown areas, trenching for underground transmission lines) and areas that will be cleared for the operational life of the Project and rehabilitated at the end of the Project life (e.g. for the installation of infrastructure such as access roads, WTG footings and hardstand areas).

As outlined in Section 3.1, the Project Site includes turbine exclusion zones to minimise clearance of trees and potential impacts on threatened native vegetation communities (if present). However, some clearance of vegetation within the turbine exclusion zones will be required for the development of linear ancillary infrastructure (e.g. transmission lines and roads). Further ecological surveys will be undertaken to ground-truth the vegetation classifications, map threatened flora species and avoid potential habitat for threatened species and threatened native vegetation communities (where possible).

As outlined in Section 4.5.3, Nature Advisory identified two threatened terrestrial fauna species with potential to occur within the Project Site, namely spotted-tailed quoll and Tasmanian devil. The susceptibility of these species to the potential impacts of the Project has been considered based on the mobility of the species, availability and extent of suitable habitat in the region, and susceptibility to indirect disturbance and mortality from the construction, operation and decommissioning of the wind farm. Potential effects on threatened bird species are discussed in Section 5.1.1. Potential effects on threatened aquatic species are discussed in Section 5.1.4.

As outlined in Section 4.5.1, the Project Site mostly comprises moorland, sedgeland and rushland (including buttongrass plains). The buttongrass plains that dominate the turbine development areas are poorly drained, exposed, treeless and lacking any topsoil. The areas are frequently burnt in summer, sodden in winter, and do not have burrowable soil to provide habitat for denning, shelter or foraging. During surveys in 2021 and 2022, the homogenous and exposed habitat of the plains was found to provide low food availability for carnivores (Nature Advisory, 2023). Nature Advisory concludes that it is unlikely devils and quolls would be using the buttongrass plateaus in the turbine development areas for denning, hence minimising the potential for the Project to impact on denning habitat. There may be, however, areas of potentially suitable habitat for breeding, shelter and foraging for devils and quolls in the forested gullies that form part of the turbine exclusion zones (noting some impacts in these turbine exclusion zones will result from construction

of ancillary infrastructure such as roads and transmission lines). Further consideration of devil and quoll habitat and impact will be undertaken during the assessment phase.

The Project also has the potential to affect the Tasmanian devil and spotted-tailed quoll through an increased risk of vehicle collision and mortality associated with construction and maintenance traffic. This risk will be mitigated through the implementation of measures during construction and operation, including enforced speed reductions, limiting traffic movement between dusk and dawn, verge mowing, and monitoring and removal of roadkill from the roads to reduce the incidence of secondary roadkill. The effectiveness of these measures has been demonstrated at the Granville Harbour Wind Farm (adjacent to the Project Site).

With the exclusion of the increased risk of vehicle collision and mortality associated with construction and maintenance traffic, the potential effects of the Project on terrestrial ecology are limited to the Project Site.

5.1.3 Weeds and pathogens

The Project has the potential to introduce or spread declared weeds and other pathogens during construction and maintenance activities. The locations of declared weed species (if present) will be recorded during further ecological assessments. The spread of diseases and weeds will be managed through the environmental management plans developed for both the construction and operational phases of the Project. The weed management measures implemented as part of the Project could improve the management of weed species on the reserves and Crown land that make up the Project Site. A wheel wash will be installed on site for Phytophthora management.

5.1.4 Aquatic ecology

Potential habitat for threatened fish (Australian grayling) and invertebrate species (Heazlewood River and Little Henty River Hydrobiid Snails) occurs within the creeks and rivers in the Project Site. The turbine exclusion zones include areas up to 60 m from the banks of waterways. As previously noted, some clearance will occur within the turbine exclusion zones, but this will be minimised. Potential construction impacts to waterways will be mitigated through the development of a Construction Environmental Management Plan (CEMP), including appropriate erosion and sediment controls.

Summary of effects – Ecology

Potential effects of the Project on the site	Potential effects on areas of land in the vicinity of the Project Site
• Vegetation clearance (vegetation community, flora species) • Loss of habitat values • Potential for avifauna collision	• Roadkill risk • Spread of declared weeds or other pathogens

5.2 Noise emissions

The Project will generate noise emissions during construction and operation. However, the potential to cause nuisance noise at sensitive receptors is minimised through the site selection and turbine exclusion zones.

Construction phase noise may be associated with quarrying activities (if suitable resources for construction and aggregate materials are identified onsite), blasting for quarrying and footprint excavation (if required), civil works, concrete batching, construction and assembly of Project components, and traffic. The construction phase may be lengthy both for individual wind farm stages, but also considering that stages may be scheduled in such a way that the overall construction process may take many years. Wind farm construction, however, is generally dispersed across a very large area (i.e. different parts of the Project Site would be subject to noise at different times).

Operational phase noise may be associated with the operation of the WTGs and some traffic noise from operational vehicles accessing the Project Site. However, this will be very limited, as operational site access requirements are relatively small and would generally be limited to light vehicles.

There are no residential properties within the Project Site. The Project Site is, however, used for recreational pursuits including four-wheel driving, mountain bike riding, camping, bushwalking, and firewood collection, which could be impacted by construction or operational noise.

There are several towns and isolated residences beyond the boundary of the Project Site, some of which lie relatively close to the boundary. To address potential amenity risks, the proponent has established WTG exclusion zones, with a minimum setback of 3 km from local towns and a minimum setback of 1 km from isolated residences outside local towns (see Table 4).

Beyond the Project Site, the nearest sensitive receptors are residences on the coast south of Granville Harbour (approximately 70 m from the Project Site boundary but, as outlined above, over 1 km from the nearest potential WTG location), the township of Granville Harbour (approximately 2.5 km from the boundary of the Project Site, but with some isolated residences 1.5 km from the boundary) and the township of Zeehan (with the closest known residential buildings approximately 500 m from the boundary of the Project Site, but over 3 km from the nearest potential WTG location).

A noise assessment (addressing both construction and operational phases) will be undertaken to characterise the existing noise environment, predict the noise impacts from the Project and determine necessary mitigation measures to ensure noise levels are managed to an acceptable level. The noise assessment will be used to inform the final wind farm layout and staging to minimise impacts to sensitive receptors.

Summary of effects – Noise

Potential effects of the Project on the site	Potential effects on areas of land in the vicinity of the Project Site
Potential construction and operational noise impacts on recreational use.	Potential construction and operational noise impacts to sensitive receptors (to be minimised through the turbine exclusion zones and the final wind farm layout).

5.3 Air emissions

During construction the Project has the potential to generate localised air emissions including dust and vehicle emissions. These potential emissions will be largely within the Project Site, but some impact beyond the boundary of the Project Site is possible as a result of offsite traffic movements.

Once operational, air emissions from the Project are very limited, with the possibility of minor dust and vehicle emissions from operations and maintenance crew both within the Project Site and along access routes in the broader region.

The Project does not propose any new point sources for air emissions.

The impact assessment phase will involve further consideration of potential air emissions and establish mitigation measures to ensure air emissions are minimised and do not result in environmental or amenity impacts.

Summary of effects – Air emissions

Potential effects of the Project on the site	Potential effects on areas of land in the vicinity of the Project Site
Potential air quality impacts on recreational use (dust and vehicle emissions).	Potential air quality impacts along access routes (dust and vehicle emissions).

5.4 Soils and geoconservation

The Project Site includes several known geoconservation sites (refer Section 4.7) ranging from district to global significance. The construction phase of the Project has the potential to impact on the geomorphological values of these sites through ground disturbance and potentially via increased accessibility to the public. A geomorphological assessment will be undertaken to characterise these sites and inform the final wind farm layout and any additional mitigation measures. Many of these

geoconservation sites are mapped at landscape scale, and it is anticipated that key features of the sites can be largely avoided by careful siting of wind farm infrastructure.

The LIST shows very small areas of potential acid sulfate soils mapped within the site. Lake Pieman is mapped as extremely low probability of acid sulfate soils and there are several small patches of low probability acid sulfate soils mapped across the Project Site. Further consideration of acid sulfate soils will be made during the impact assessment phase and construction mitigation measures applied as appropriate.

Parts of the Project Site have a history of mining and other activities, which pose a potential risk of land contamination. Given the scale of the Project Site and the dispersed nature of historically potentially contaminated activities, it is consider likely that risks associated with historical land contamination can be readily avoided or managed. However, a site-based contamination assessment will be undertaken to characterise the risks and management measures.

Summary of effects – Soils and geoconservation

Potential effects of the Project on the site	Potential effects on areas of land in the vicinity of the Project Site
• Potential impacts to geomorphological values through ground disturbance and increased accessibility. • Potential to impact on areas containing extremely low and low probability of acid sulfate soils. • Potential to impact on areas containing historical contaminated soils.	No effects anticipated.

5.5 Surface water

The potential for impacts to surface water during construction of the Project is considered to be low with the implementation of appropriate construction management and mitigation controls. The Project will be designed to avoid construction in or immediately adjacent to waterways and water bodies where possible.

A licence to take water from Lake Pieman will be sought to supply water required during construction. The potential impacts of water extraction from Lake Pieman will be managed through the licensing process to ensure environmental flows are not compromised. Operational water requirements will be minimal and will be met through rainwater.

Once operational the Project poses almost no risk to local surface waters. While there is some potential for surface runoff from roads and hardstands, or discharge from onsite wastewater systems, with appropriate design in place this risk can be reduced to negligible.

Summary of effects – Surface water

Potential effects of the Project on the site	Potential effects on areas of land in the vicinity of the Project Site
• Low potential to impact surface water during construction of the Project. • Potential impacts to Lake Pieman associated with licensed water use during operation.	No effects anticipated.

5.6 Groundwater

It is not expected that groundwater will be extracted for use during the Project's construction or operation. Nonetheless the Project has the potential to impact on groundwater through subsurface excavations during construction (that could intersect groundwater and potentially require dewatering). In elevated parts of the site, groundwater levels are expected to be relatively deep; however, in the lower lying flats and plains, groundwater may be relatively shallow and active dewatering is likely to be required. In the event groundwater dewatering is required, water discharge will need to be appropriately managed to avoid any impact from discharge back into surface water bodies.

Once operational the Project will pose no ongoing risk to groundwater.

Summary of effects – Groundwater

Potential effects of the Project on the site	Potential effects on areas of land in the vicinity of the Project Site
Potential to impact groundwater through subsurface excavation during construction.	No effects anticipated.

5.7 Aboriginal cultural values and landscape

The findings of previous archaeological investigations undertaken, together with the AHR search results (see Section 4.6.1), indicate the most likely site types to be encountered in the Project Site will be artefact scatters/isolated artefacts, and living sites, or a combination thereof. Site density is likely to be comparatively low. Hut depressions, rock engravings and Aboriginal stone quarries have also been recorded in the general surrounds of Granville Harbour and it is therefore possible, although less likely, that these site types may also be encountered.

The Project Site sits within the southern extent of the area nominated for the Tarkine National Heritage Listing. In the assessment of the nominated listing of the Tarkine, the Australian Heritage Council found that the rainforests in the nominated area were of value and important for their flora, which has links to the ancient continent of Gondwana. The coastline was also recognised by the Australian Heritage Council for the numerous hut depressions found in Aboriginal shell middens. The huts and middens are the remnants of an unusual and specialised Aboriginal way of life based on the hunting of seals and land mammals, and the gathering of shellfish. The resulting National Heritage listing of the Western Tasmanian Aboriginal Cultural Landscape to protect these values is situated outside the Project Site, 5 km to the north-west and will not be directly impacted by the Project.

Notwithstanding this, the proponent recognises the values of the cultural landscape and the temperate rainforest and the opportunity the Project provides in furthering education, research and cooperative management of those values.

To ensure protection of these values the proponent has selected the Project Site to avoid the Western Tasmanian Aboriginal Cultural Landscape Area. The Project Site has been selected in areas that have had previous disturbance from mineral exploration, transmission line infrastructure, hydro-electric infrastructure, tracks and roads. The Project Site has also been selected to avoid large tracts of temperate rainforest, and turbine exclusion zones have been nominated on any areas where rainforest vegetation is present, namely in the gullies that intersperse the buttongrass plateaus. This is to ensure the tracks of rainforest between the buttongrass plateaus are avoided. The Project is in a unique location and, being on reserved land managed by the Tasmania Parks and Wildlife Service, provides an opportunity for the Project to collaborate with land managers on the protection of recognised values particularly in areas adjacent to the Project Site. For example, the Project could increase resourcing available for cooperative management of the coastal areas that have cultural heritage significance and further education and research opportunities on the natural values of the temperate rainforest and environmental values in the vicinity of the Project. These opportunities will be further investigated during the impact study phase of the Project and as part of the Reserve Activity Assessment.

Consultation with Aboriginal community groups has commenced and will be ongoing throughout the planning and approvals phase of the Project to understand the effects on cultural landscape values and to ensure impacts are avoided or minimised.

Lake Pieman

Pieman Road

Granville Harbour

Zeehan

Trial Harbour

0 1 2 3 km

Map proj.: GDA 2020 MGA Zone 55

N

Project Site (the Land)

Town / Community

State road

Secondary road

ACID SULFATE SOIL PROBABILITY

Low

Extremely Low

era PLANNING & ENVIRONMENT

WRE WESTCOAST RENEWABLE ENERGY

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Whaleback Ridge Renewable Energy Project

Figure 12
Mapped acid sulfate soils risk

Given the nature of the Project, the specific location and management of infrastructure can be adjusted to avoid any direct impact. Further studies will inform the final design layout accordingly.

Summary of effects – Aboriginal cultural values and landscape

Potential effects of the Project on the site	Potential effects on areas of land in the vicinity of the Project Site
To be determined through the impact assessment phase of the Project.	To be determined through the impact assessment phase of the Project.

5.8 Historic heritage

CHMA undertook a search of several historic registers and databases to determine the extent of historic sites and features in the vicinity of the study area. This showed one heritage listed feature that is located within the boundaries of the Project Site – the Carn Brea Tin Mine. The heritage feature is permanently registered on the Tasmanian Heritage Register and lies within the proposed turbine exclusion zone along the west coast.

Given the nature of the Project, the specific location and management of infrastructure can be adjusted to avoid any direct impact and ensure appropriate setbacks. Further studies will inform the final design layout accordingly.

Summary of effects – Historic heritage

Potential effects of the Project on the site	Potential effects on areas of land in the vicinity of the Project Site
No effects anticipated.	No effects anticipated.

5.9 Traffic effects

The effects of the Project on the surrounding traffic network will largely relate to the construction phase. The area has good access to sub-arterial roads with a proven transport route for turbine components from the Port of Burnie to Granville Harbour.

Heemskirk Road and Pieman Road run through the Project Site and there are many existing access tracks for mineral exploration activities that run throughout the Project Site.

Any road upgrades required outside the Project Site to facilitate construction access are outside the scope of this MPP and will be subject to separate approvals.

The road network will be maintained for the life of the Project to enable ongoing operational and maintenance activities at each WTG. The road network will be made available to other land users as appropriate, including ongoing site access for existing use rights.

Summary of effects – Traffic

Potential effects of the Project on the site	Potential effects on areas of land in the vicinity of the Project Site
• Construction of internal roads within the Project Site. • Increased traffic on existing roads and access tracks.	• Increased traffic on surrounding road network.

5.10 Visual and landscape effects

As described in Section 4, the existing landscape within the Project Site is characterised by the ranges of Mount Heemskirk in the south of the Project Site, and Meredith Range and Whaleback Ridge in the north. The Project Site is largely undeveloped, and the ridges are dominated by buttongrass plateaus.

The key visual and landscape effect of the Project will be the visibility of the WTGs from the surrounding area. The Project comprises up to 500 WTGs, with an estimated tip height of 250 m, likely to be located on the ridges of the Project Site to avoid site constraints and environmentally sensitive areas. A high-level

visibility model has been completed for the Project (see Figure 13), which indicates that some of the WTGs may be visible from vantage points in the surrounding communities, roads and recreational areas.

The Project Site selection and remoteness from the surrounding communities limits the potential visual and landscape impacts. Some of the WTGs will potentially be visible from locations in Granville Harbour (located approximately 2.5 km west); however, this view will be in the context of WTGs from the existing Granville Harbour Wind Farm. Due to the topography of the Project Site and surrounding area, the potential landscape and visual impacts in the surrounding townships of Trial Harbour (approximately 3 km south) and Zeehan (approximately 3.5 km east) are limited. The Project is likely to be visible from vantage points in townships further away, including Queenstown and Rosebery (approximately 14 km east).

The TWWHA boundary is located approximately 25 km east of the Project Site (Cradle Mountain is approximately 56 km from the Project Site), separated by the West Coast Range and the townships of Queenstown, Zeehan and Rosebery. Limited visual impacts are modelled within the TWWHA, with some of the WTGs potentially visible at locations in the western extent of the reserve.

A landscape visual impact assessment will be completed for the Project to assess the expected visual impact on the surrounding landscape and its viewers. The assessment will be used to inform the siting of the WTGs within the Project Site and other design features to mitigate the potential visual and landscape effects of the Project.

Summary of effects – Visual and landscape

Potential effects of the Project on the site	Potential effects on areas of land in the vicinity of the Project Site
Potential visual impacts from roads and recreational areas.	Potential visual impacts from vantage points in the surrounding communities, roads and recreational areas.

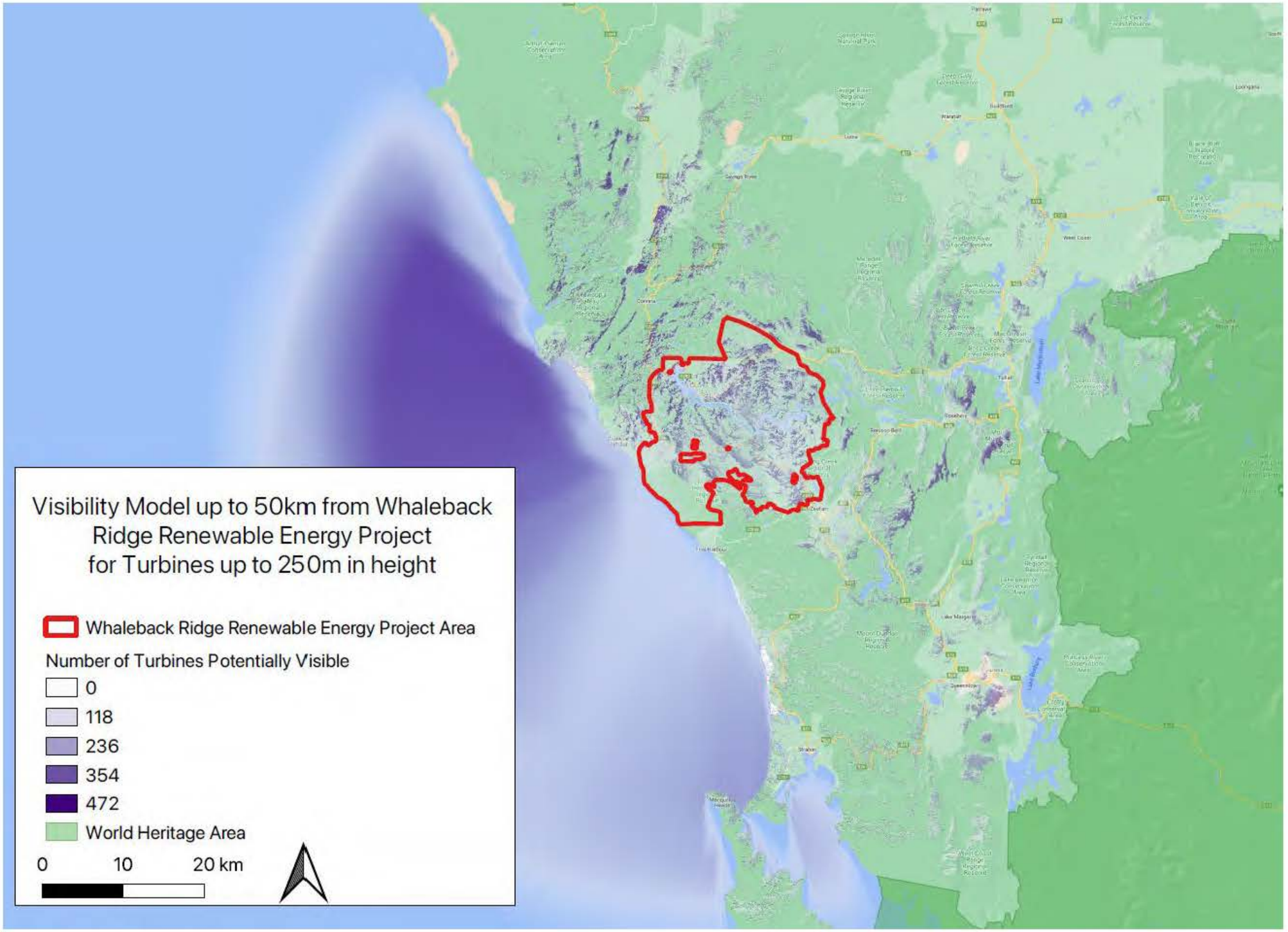

Figure 13 Visibility model of up to 50 km from the Project Site for WTGs up to 250 m in height

5.11 Shadow flicker and blade glint

Wind farms have the potential to cause shadow flicker effects, which can occur when the sun passes behind the rotating blades of the WTGs and casts a moving shadow over surrounding areas. Shadow flicker effects are most noticeable inside buildings (i.e. where the flicker occurs through a window). The occurrence and duration of effects depends on a variety of factors, including the direction of the building relative to the WTG, distance to the WTG, WTG parameters (height, rotor diameter), wind direction and environmental conditions (weather conditions and time of day and year) (DNV Energy Systems, 2022).

The Project Site is remote from buildings, with the exception of some dwellings (shacks) located approximately 70 m west at Granville Harbour (see Figure 7). The turbine exclusion zone for the Project includes a 1.5 km buffer from the coastline and a 1 km buffer from the shacks at Granville Harbour to avoid/minimise potential shadow flicker impacts on these properties. A 3,000 m turbine exclusion zone has been set for any dwellings located at Trial Harbour and Zeehan. There are no dwellings located within the Project Site. Shadow flicker will be further considered in the assessment phase of the Project, but given the distance to sensitive receptors, the potential risk is expected to be low.

Another potential impact of wind farms is blade glint, caused by the regular reflection of the sun off rotating turbine blades which can cause nuisance to nearby sensitive receptors. Potential blade glint impacts are generally avoided for modern WTGs through coating the turbine blades with a non-reflective paint (DNV Energy Systems, 2022). Blade glint impacts are therefore unlikely to occur as a result of the Project.

Summary of effects – Shadow flicker and blade glint

Potential effects of the Project on the site	Potential effects on areas of land in the vicinity of the Project Site
No effects anticipated.	No effects anticipated.

5.12 Electromagnetic interference

Wind farms have the potential to cause electromagnetic interference (EMI) through the production of electromagnetic fields (EMFs). WTGs can cause the physical obstruction of radiocommunications (Clean Energy Council, 2018).

EMFs are produced by electrical equipment and infrastructure, as well as natural sources (e.g. lightning, solar flares). Existing sources of EMFs within the Project Site include the Farrell-Reece transmission line and the Reece Power Station.

The impact assessment phase will involve consideration of potential EMI impacts of the Project and will inform the final siting of the WTGs.

Summary of effects – EMI

Potential effects of the Project on the site	Potential effects on areas of land in the vicinity of the Project Site
To be determined through the impact assessment phase.	To be determined through the impact assessment phase.

5.13 Waste

Construction of the Project will generate a variety of wastes, likely to include:

- Waste construction materials, such as concrete, plastic and steel
- General waste, including general recyclables
- Small quantities of controlled wastes, such as solvents and paints
- Waste oil or hydraulic fluid
- Waste from transportable toilets.

Waste generated during the operational phase of the Project is expected to be limited to smaller quantities of paints, oils and lubricants used for maintenance, general waste from the office and workshop facilities, and wastewater from the onsite facilities.

Summary of effects – Waste

Potential effects of the Project on the site	Potential effects on areas of land in the vicinity of the Project Site
Possible temporary storage of waste during construction.	Authorised offsite disposal of waste.

5.14 Aviation safety

The nearest certified aerodrome to the Project Site is the Strahan Aerodrome, located approximately 30 km south of the Project Site (CASA, 2023). The Strahan Aerodrome is operated by the West Coast Council and is registered by the Civil Aviation Safety Authority (CASA) under the Civil Aviation Safety Regulations. Under the Regulations, the Strahan Aerodrome has an obstacle limitation surface (OLS) with an approach surface length of 2,500 m and other surfaces radius of 3,800 m (Griffiths, 2019). The Project Site is well outside the aerodrome's OLS. An aviation assessment undertaken for the meteorological masts installed at the Project Site determined that operations at the Strahan Aerodrome would not be affected.

Additional aviation operations in the vicinity of the Project Site include unregistered airports located at Zeehan (approximately 3 km south-east of the Project Site) and Queenstown (approximately 27 km south-east of the Project Site).

The potential effects of the Project on surrounding aviation operations and safety will be assessed during the impact assessment phase of the Project.

Summary of effects – Aviation safety

Potential effects of the Project on the site	Potential effects on areas of land in the vicinity of the Project Site
No effects anticipated.	To be determined through the impact assessment phase.

5.15 Health, economic and social effects

SGS Economics and Planning (SGS) has prepared a high-level overview of the economy in north-west Tasmania and the relative importance of the Project (see Appendix E).

SGS identified that a project of this scale can substantially lift and change the economic outlook of the region. The review stated that the Project will bring significant investment into the region during the development and operational phases of the Project. The total expenditure in its construction phase is approximately $5 billion, representing a significant investment in the north-west region.

As outlined in Section 3.1.3, the Project will be delivered in stages. The first stage will comprise 288 MW and have a capital expenditure of $550 million over two years of construction. It will create approximately 170 FTE positions during construction and 16 FTE positions per annum during operation.

Subsequent stages will generate additional construction and operational phase jobs and local investment. As subsequent stages are likely to be larger than the first, the construction workforce is also expected to be larger. SGS has estimated the construction workforce for subsequent stages is likely to be double that of the first stage (i.e. >340 FTE positions), which may be expected to unfold over a 10-year construction period. The full-scale Project is estimated to generate 160 FTE positions per annum during operation, significantly lifting economic activity in the West Coast LGA. The estimated operational expenditure of the Project is $20.2 billion, representing an average of $673 million per annum (assuming an initial 30 years project life).

WRE is working with industry and business associations like Advance West North West, Burnie Chamber of Commerce and Tasmanian Chamber of Commerce to increase the capacity and capability of Tasmanian businesses to participate in the Project. Construction resources will be sourced from Tasmania as a priority, further enhancing the benefits of the Project. In addition, the surveys and studies required for the Project

during the impact assessment phase (see Section 6) will be undertaken by local consultants and specialists where possible.

The direct impacts of the Project will generate additional flow-on effects to the wider economy that have not yet been estimated (SGS Economics & Planning, 2023). This includes the potential for significant manufacturing jobs across the local, national and international economies.

The SGS report notes that when assessing costs and benefits, it is necessary to consider what would happen to a region if the Project was not to go ahead (base case scenario). In this regard both the west coast and the entire north-west Tasmania region are relevant to consider. SGS identifies that without the Project (or other similar projects), the base case scenario will likely see a further decline of population and a continued reliance on a narrow economic base on the west coast.

Overall, SGS concludes the Project will bring significant employment opportunities to the wider region in addition to the potential lease revenues to State Government for use of Crown land; however, the report recognises that these opportunities will also bring challenges in terms of housing, training and education. It is understood that housing is a key constraint on economic growth on the west coast, causing population growth to lag behind jobs growth. The SGS report identified potential social costs of the Project relating to social disruption during construction, housing stress and social cohesion. Construction workforce accommodation is discussed in Section 3.7.2. WRE is participating in a joint working group to provide long-term sustainable housing to regional communities once the initial needs of construction have been met. Priorities include provision for emergency services worker accommodation, health/aged care facilities and tourism.

To ensure that social and economic benefits, job creation and economic diversification are achieved, WRE will undertake further analysis and assessment of these matters in the impact assessment phase of the Project (see Table 10).

WRE is currently sponsoring several local community groups and charitable organisations, including the North Western Tasmania Axemen Association, the Zeehan Gem and Mineral Fair (2022 and 2023), Rosebery Toorak Football Club, Ronald McDonald House Charities, Burnie Rotary Club, Alex and Will Eaves (Burnie cyclists), and the ABC Giving Tree.

Summary of effects – Health, economic and social

Potential effects of the Project on the site	Potential effects on areas of land in the vicinity of the Project Site
No effects anticipated.	• Significant economic investment to the north-west region. • Job creation and diversification of economy of the north-west region, with flow-on effects to the broader economy. • Potential to support housing and community infrastructure objectives for the west coast region. • Community initiatives (sponsorships and donations). • Facilitates transition to renewable energy.

5.16 Greenhouse gases

The Project will have a net positive effect on greenhouse gas emissions reduction through providing a secure renewable energy resource and facilitating the renewable energy transition. The transition to renewable energy is critical to reducing greenhouse gas emissions, with renewable energy and increased electrification estimated to achieve three-quarters of the required global energy-related emissions reductions (IUCN, 2021).

As outlined in Section 2.1.2, the Project will generate enough renewable energy to achieve the TRET of 200% renewable energy by 2040. The Project also facilitates future opportunities for renewable hydrogen production facilities, which would contribute to Tasmania's aim to become a significant global supplier of renewable hydrogen for export and domestic use by 2030.

The Project will generate minor emissions during construction.

Summary of effects – Greenhouse gases

Potential effects of the Project on the site	Potential effects on areas of land in the vicinity of the Project Site
• Minor construction emissions.	• Provides a secure renewable energy resource and will facilitate the transition to renewable energy. • Renewable energy generated will achieve the TRET and facilitate future opportunities for renewable hydrogen production.

5.17 Other positive effects

In addition to the positive effects of the Project outlined above (see Section 5.15 regarding positive socio-economic effects and Section 5.16 regarding positive effects on greenhouse gas emissions reductions and the renewable energy transition), the Project will result in a number of other positive effects in relation to:

- Research and education opportunities
- Land management improvement/programs
- Development of shared infrastructure.

The large-scale nature of the Project has the potential to create research and education opportunities associated with renewable energy and green industries. As the largest renewable energy project in Tasmania, the Project creates research opportunities to better understand and manage the potential impacts of such projects. The extent of the study area within reserves provides opportunity for the Project to facilitate research including ecological research such as orange-bellied parrot tracking.

The Project has the potential to improve the management of the reserves located within or near the Project Site through the implementation of management and mitigation measures associated with the Project. An example of this is the management of weed species that occur within the Project Site, or opportunities to improve management and protection measures for culturally significant values along the coastline.

The Project has the potential to develop shared infrastructure such as improving telecommunications, access and emergency management to the region.

Summary of other positive effects

Potential effects of the Project	Potential effects on areas of land in the vicinity of the Project Site
Improved land management within the Project Site.	Creation of research and education opportunities. Shared infrastructure.

6 Proposed surveys and studies

This section addresses the requirements of 60F(1)(i) of LUPAA.

Several assessments have been undertaken for the Project to date to inform site selection and the turbine exclusion zones. A summary of the surveys and studies that have been undertaken or are proposed for the Project is provided in Table 10.

Table 10 Summary of surveys and studies undertaken and proposed for the Project

Aspect	Summary of studies
Aboriginal cultural heritage	A desktop Aboriginal cultural heritage assessment has been completed. Field investigations will be undertaken for targeted areas as advised by the desktop research. A review of the cultural landscape values will be undertaken through consultation with Aboriginal communities and groups. Consultation will be ongoing throughout the planning and approvals phase of the Project to understand the effects on cultural landscape values and to ensure impacts are avoided or minimised.
Historic heritage	A desktop historic heritage assessment has been completed. Field investigations will be undertaken for targeted areas as advised by the desktop research.
Avifauna	Avifauna and bat surveys have been undertaken. Over autumn 2021 and summer 2022, field surveys included two bird utilisation surveys, two raptor utilisation surveys, two targeted orange-bellied parrot surveys, and two bat surveys using automated bat detectors. An aerial eagle nest search was undertaken in May–June 2022. Further avifauna surveys will be undertaken as required by the assessment criteria issued for the Project.
Terrestrial ecology	A desktop flora and fauna assessment was undertaken in 2023. Field investigations (including a trapping program) are proposed to be undertaken for the Tasmanian devil and spotted-tail quoll. Field investigations for ecological communities and targeted flora species will be undertaken.
Geoconservation	A desktop assessment is proposed to be undertaken, with follow-up field investigations to be undertaken as recommended by the desktop assessment.
Visual impacts including shadow flicker and blade glint	A high-level viewshed analysis has been completed. A visual impact assessment will be undertaken including photomontages and assessment of shadow flicker and blade glint.
Noise and vibration	A noise and vibration impact assessment will be undertaken. This will address both construction and operational phase noise. The assessment will include onsite monitoring to establish baseline noise levels, qualitative discussion of construction phase impacts, modelling of operational phase noise impacts to inform wind farm layout, impact assessment and mitigation measures.
Traffic	A traffic impact assessment will be prepared that considers both construction and operational phases for the next stage of the assessment process.
Socio-economic impact assessments	A high-level social and economic assessment has been completed in 2023. A further social and economic impact assessment will be undertaken, including community consultation. A supply chain analysis and opportunities to optimise the economic contribution to Tasmania will be undertaken as part of a cost-benefit analysis.
Geotechnical	A landslide hazard assessment report will be prepared that ensures that a tolerable risk can be achieved and maintained for the type, scale, intensity and intended life of use or development on land within a landslip hazard area. Geotechnical work for turbine foundation design may be required.

Aspect	Summary of studies
Drainage, stormwater and surface water management	A drainage, stormwater and surface water assessment will be completed, including development of a management plan to mitigate potential impacts if identified.
Construction materials supply	A construction material investigation will be undertaken to develop a plan for construction material supply, including development of design for quarries if co-located onsite as part of the Project.
People and place-based design and opportunity review	In conjunction with community and stakeholder consultation, a collaborative part of the design process will include a "place-based design process" aimed at integrating feedback from key stakeholders into design, so that identified opportunities and constraints for the Project inform project designs and maximise benefits while minimising impacts. This body of work is anticipated to facilitate the realisation of the Project furthering reserve objectives and land use objectives for all stakeholders.
Aviation	An aviation impact assessment will be completed to ensure that the Project satisfies aviation safety regulatory requirements.
Waste	A waste management assessment will be undertaken and a report prepared to inform waste management for the Project.
EMI	An assessment will be undertaken to determine the potential EMI impacts of the Project on radio communication services surrounding the Project Site.

7 Proposed schedule

This section addresses the requirements of 60F(1)(j) of LUPAA.

The indicative Project schedule is shown in Figure 14. It is the proponent's expectation that the major project impact statement (MPIS) will be lodged in mid-2024, to allow sufficient time for specialist studies and preliminary design. Assuming project approval in mid-2025 and allowing for an approximate two-year construction period for stage 1, it is expected that stage 1 of the Project will complete construction in early 2028 and be operational by later the same year.

As the Project staging (beyond stage 1) is still being developed, it is not possible to confirm when subsequent Project stages will be constructed and completed. However, it is the proponent's expectation that all Project stages are likely to be constructed and operational by 2040, depending on market demand.

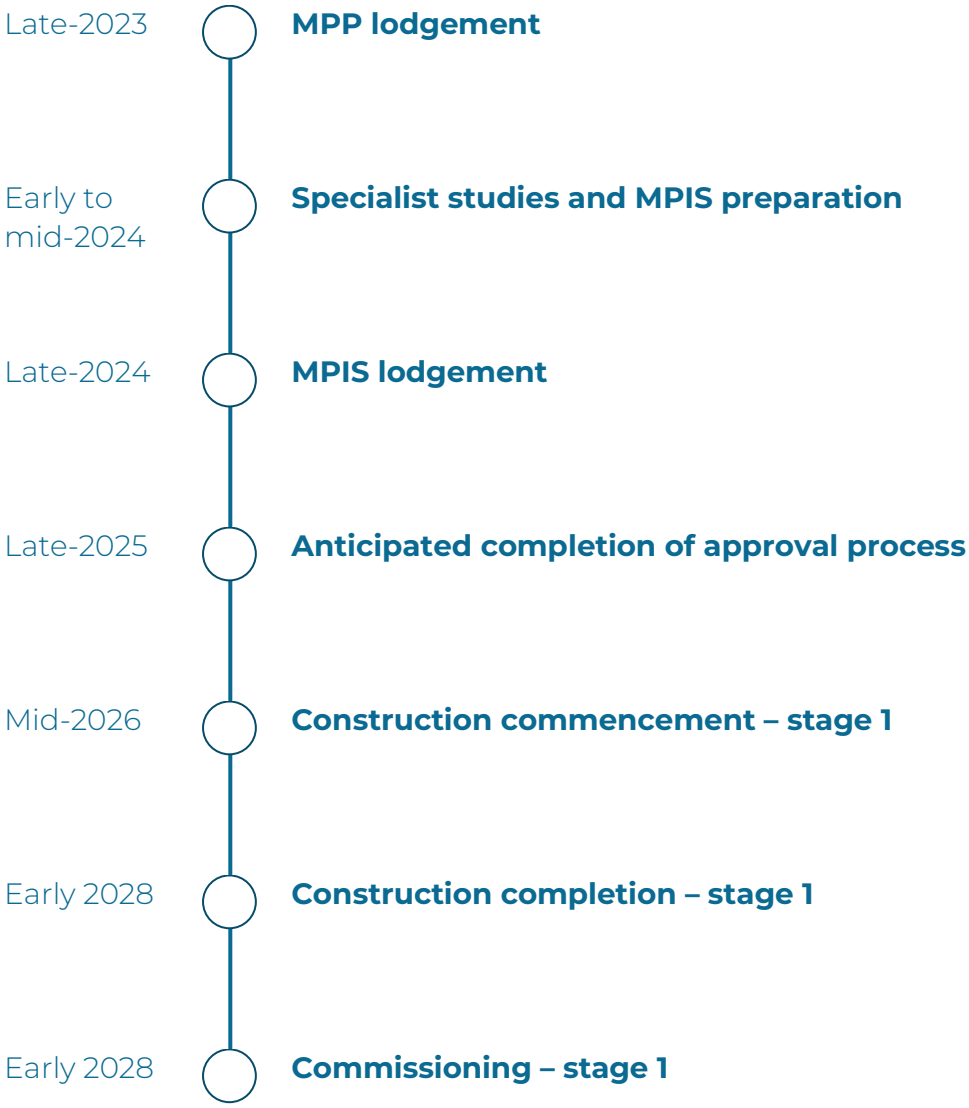

Figure 14 Indicative Project schedule

8 Planning considerations

This section addresses the requirements of 60F(1)(m) of LUPAA.

8.1 Tasmanian Planning Scheme – West Coast

The Project Site is zoned Environmental Management and Rural under the Tasmania Planning Scheme – West Coast as shown in Figure 15, with the Project falling within the use class of Utilities:

> *use of land for utilities and infrastructure including:*
>
> *a. telecommunications;*
>
> *b. electricity generation;*
>
> *c. transmitting or distributing gas, oil, or electricity;*
>
> *d. transport networks;*
>
> *e. collecting, treating, transmitting, storing or distributing water; or*
>
> *f. collecting, treating, or disposing of storm or floodwater, sewage, or sullage.*
>
> *Examples include an electrical sub-station or powerline, gas, water or sewerage main, optic fibre main or distribution hub, pumping station, railway line, retention basin, road, sewage treatment plant, storm or flood water drain, water storage dam and weir.*

8.1.1 Zoning

Utilities is a permitted use in the Rural Zone and a discretionary use in the Environmental Management Zone. As outlined in Table 11 there are no applicable standards in either zoning that are considered to prohibit the Project and would be required to be amended if approved, noting that the Project will not be specifically assessed against the planning scheme, but rather be reliant on project specific guidelines.

Table 11 Standards under the Rural Zone in the Tasmanian Planning Scheme – West Coast

Standard	Response
Clause 20.3.1, Discretionary use	Not applicable.
Clause 20.4.1, Building height	Would not meet acceptable solution. Capable of meeting performance criterion.
Clause 20.4.2, Setbacks	Capable of meeting acceptable solutions or performance criteria.
Clause 20.4.3, Access for new dwellings	Not applicable.

Table 12 Standards under the Environmental Management Zone in the Tasmanian Planning Scheme – West Coast

Standard	Response
Clause 23.3.1, Discretionary uses	No acceptable solution. Capable of meeting performance criterion.
Clause 23.4.1, Development area	Capable of meeting acceptable solutions or performance criteria. Compliance with acceptable solution is dependent on timing of authority under *National Parks and Reserved Land Regulations 2009*.
Clause 23.4.2, Building height, setback and siting	Capable of meeting acceptable solutions or performance criteria, depending on timing of authority under *National Parks and Reserved Land Regulations 2009*.

Standard	Response
Clause 23.4.3, Exterior finish	Capable of meeting acceptable solutions or performance criteria, depending on timing of authority under *National Parks and Reserved Land Regulations 2009*.
Clause 23.4.4, Vegetation management	Capable of meeting acceptable solutions or performance criteria, depending on timing of authority under *National Parks and Reserved Land Regulations 2009*.

8.1.2 Planning scheme codes

The Project Site is affected by the following codes (overlays are shown in Figure 16):

- Parking and Sustainable Transport Code
- Road and Railway Assets Code
- Natural Assets Code
  - Priority vegetation area, applied by way of overlay
  - Waterway and coastal protection area, applied by way of overlay
- Bushfire Prone Areas Code, applied by way of overlay
- Landslip Hazard Code, applied by way of overlay.

It is anticipated that the issues dealt with in each of these codes will be addressed through reports prepared by suitably qualified experts at the next stage of the assessment process.

None of the codes include a specific prohibition that would need to be overcome by modifying the provisions of the code. In particular:

- The effects of the Project on the surrounding traffic network will largely relate to the construction phase. A traffic impact assessment will be prepared in accordance with the transport code to ensure the safety and efficiency of the road and railway networks.
- The Project is not anticipated to be a hazardous, critical or vulnerable use as defined under the Bushfire Prone Area Code. In particular, hazardous chemicals will not be stored in manifest quantities.
- The Project Site includes turbine exclusion zones to minimise clearance of trees and potential impacts on threatened native vegetation communities. The Project Site is primarily comprised of moorland, sedgeland and rushland (including buttongrass plains), with the buttongrass plains dominating the turbine development areas. Further ecological surveys will be undertaken to ground-truth the vegetation classifications and avoid potential habitat for threatened species, threatened native vegetation communities and waterways, including the associated riparian areas, where possible.
- The Project Site contains areas identified as being a landslip hazard[7]; further onsite studies will be prepared to inform the location and design of the WTGs to ensure that a tolerable risk can be achieved and maintained for the type, scale, intensity and intended life of the proposed renewable energy development.

[7] See landslip hazard Tasmania planning scheme code overlay on the LIST.

Granville Harbour

Trial Harbour

Zeehan

0 1 2 3 km

N

Map proj.: GDA 2020 MGA Zone 55

- Project Site (the Land)
- Town / community
- State road

TASMANIAN PLANNING ZONES

- Community Purpose
- Environmental Management
- General Industrial
- General Residential
- Light Industrial
- Local Business
- Low Density Residential
- Open Space
- Recreation
- Rural
- Utilities

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WRE WESTCORP RENEWABLE ENERGY

Whaleback Ridge Renewable Energy Project

Figure 15
Land Zoning

Job Number	2122-073
Revision	V.6
Date	2 October 2023
Paper size	A3

Pieman Road

Granville Harbour

Zeehan

Trial Harbour

0 1 2 3 km

Map proj.: GDA 2020 MGA Zone 55

N

Project Site (the Land)

State road

Town / community

TASMANIAN PLANNING SCHEME CODE OVERLAY

Bushfire-prone areas

Electricity transmission infrastructure

Inner protection area

Landslip hazard

Priority vegetation area

Waterway and coastal protection area

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WRE WESTCOAST RENEWABLE ENERGY

Whaleback Ridge Renewable Energy Project

Figure 16
Code Overlays

Job Number	2122-073
Revision	V.6
Date	2 October 2023
Paper size	A3

8.1.3 Cradle Coast Regional Land Use Strategy

The purpose of the Cradle Coast Regional Land Use Strategy (CCRLUS) is to guide the land use planning process within the Cradle Coast region over a 20-year period (the CCRLUS was prepared in 2010 and declared in 2011). It is not a regulatory instrument for the purpose of individual use and development decisions; rather, it has a statutory function to inform the purpose and content of local planning schemes and has relevance for the statutory planning processes intended to deal with the consequences of change, with the unexpected, with the unusual, and with regionally significant projects. As established above, the Project is considered one to be of regional significance (CCA, 2023).

Given the CCRLUS was prepared some 13 years ago, reference to wind farms is limited. Notwithstanding, the CCRLUS recognises the significant opportunities and importance of the renewable energy sector more broadly, supporting development of renewable energy projects and maximising the economic potential in the renewable energy sector. The CCRLUS refers to the need for land use planning to adopt a policy environment that provides investment certainty and facilitates a pragmatic perspective, recognising imperatives for a transition to a renewable energy base.

Overall, the CCRLUS supports and recognises the importance of the development of renewable energy projects, subject to there being an acceptable level of impact on cultural, economic and natural resource values and on the amenity of designated sensitive use areas. Subject to the more detailed onsite assessments, the Project will be consistent with the Strategy.

8.1.4 Tasmanian Planning Policies

The Tasmanian Planning Policies (TPPs) are to set out common land use planning aims, or principles, to be achieved or applied by the Tasmanian Planning Scheme and the regional land use strategies. The TPPs are a planning instrument made under Part 2A of the *Land Use Planning and Approvals Act 1993* (LUPAA). LUPAA also requires consideration of the TPPs during the declaration and assessment of major projects.

The TPPs are currently in draft form, with a public exhibition period of the TPPs having finished on 26 June 2023 and hearings expected in relation to the policies during the second half of 2023. The draft TPPs include one for renewable energy, with the objective of that policy being:

> *To promote renewable energy use and development to support economic and employment opportunities and strengthen the State's economy, while also supporting emissions reduction*.

The policy includes six strategies, with the strategy relevant to the Project being the identification of renewable resource areas to prioritise the location of renewable energy use and development within areas that have been strategically identified for future renewable energy use and development taking into consideration the quality of the energy resource, economic and social value impacts, investor interest, and environmental and cultural heritage constraints.

In late-2022, north-west Tasmania was identified as the first area to be explored as a potential renewable energy zone in Tasmania. The exploration of the north-west, noting the Project Site is within the north-west, recognises the high-quality resource of this area, enabling large-scale renewable energy projects to be developed using economies of scale.

Given the nature of a wind farm and the size of the Project Site, the management of infrastructure can be adjusted to avoid any direct impact and ensure appropriate setbacks to maintain the ecological, scientific, scenic and cultural values of the Project Site and area more generally. Subject to further detailed assessments, the Project is considered consistent with the Renewable Energy TPP.

8.1.5 State Policies

Section 60N of LUPAA requires a major project to not contravene State Policy. This is a key requirement to determine the eligibility of the proposal to be a major project. Details explaining how the Project aligns with the existing State Policies are provided below.

8.1.5.1 State Coastal Policy 1996

The *State Coastal Policy 1996* (SCP) applies to the Crown, statutory authorities and all of Tasmania with the exception of Macquarie Island.

For the purposes of the SCP, the coastal zone refers to State waters and to all land within one kilometre of the high-water mark. The Project Site includes land that is in the coastal zone.

The principles of the SCP are:

> *Natural and cultural values of the coast shall be protected.*
>
> *The coast shall be used and developed in a sustainable manner.*
>
> *Integrated management and protection of the coastal zone is a shared responsibility.*

Through the implementation of the turbine exclusion zones, which include a 1.5 km buffer of the coastline, and the further assessments to be completed throughout the impact assessment phase (see Section 6), the Project is considered to be consistent with the relevant policy outcomes of the SCP.

Primary built infrastructure will be located outside of the coastal zone. Ancillary infrastructure (e.g. roads or transmission lines) may be located in the coastal zone. Potential impacts associated with any ancillary infrastructure will be managed through the impact assessment and design of the Project. No development will be located on actively mobile landforms.

8.1.5.2 State Policy on the Protection of Water Quality Management 1997

The *State Policy on the Protection of Water Quality Management 1997* (SPPWQM) applies to all surface waters, including coastal waters and groundwaters that are not privately owned or waters within a tank, pipe or cistern.

The purpose of the SPPWQM is:

> *To achieve the sustainable management of Tasmania's surface water and groundwater resources by protecting or enhancing their qualities while allowing for sustainable development in accordance with the objectives of Tasmania's Resource Management and Planning System.*

The potential impacts of the Project on surface water and groundwater (discussed in Sections 5.5 and 5.6) will be subject to further assessment during the impact assessment stage of the Project. This will include identification of management and mitigation measures required to meet the requirements of the SPPWQM. The Project is therefore considered to be consistent with the relevant policy outcomes of the SPPWQM.

8.1.5.3 State Policy on the Protection of Agricultural Land 2009

The *State Policy on the Protection of Agricultural Land 2009* (PAL Policy) applies to all agricultural land in Tasmania. The purpose of the Policy is:

> *To conserve and protect agricultural land so that it remains available for the sustainable development of agriculture, recognising the particular importance of prime agricultural land.*

Agricultural land is defined under the PAL Policy as:

> *all land that is in agricultural use or has the potential for agricultural use, that has not been zoned or developed for another use or would not be unduly restricted for agricultural use by its size, shape and proximity to adjoining non-agricultural uses.*

Agricultural use is defined under the PAL Policy as:

> *use of the land for propagating, cultivating or harvesting plants or for keeping and breeding of animals, excluding domestic animals and pets. It includes the handling, packing or storing of produce for dispatch to processors. It includes controlled environment agriculture and plantation forestry.*

Part of the Project Site is in the Rural Zone (Figure 15). The land zoned Rural is comprised of:

- Permanent timber production zone land
- Future potential product forest land
- Unreserved Crown land.

It is therefore zoned Rural because of its potential availability to forestry and mining land uses.

Mining is not an agricultural use. Forestry is, however, considered an agricultural use, but the land available to forestry in the Project Site is for native timber harvesting. This is not considered to be an agricultural use, having regard to how the PAL Policy is applied through the Tasmanian Planning Scheme.

It is therefore considered that the Project Site is not agricultural land for the purposes of the PAL Policy.

8.1.5.4 National Environmental Protection Measures

The National Environmental Protection Measures (NEPMs) are national statutory instruments specifying a national standard for environmental issues. NEPMs are State Policies in Tasmania under section 12A of the *State Policies and Projects Act 1993*. The requirements of the following relevant NEMPs will be addressed through the impact assessment stage of the Project:

- Air Toxics
- Ambient Air Quality
- Assessment of Site Contamination
- Diesel Vehicle Emissions
- Movement of Controlled Waste between States and Territories
- National Pollutant Inventory
- Used Packaging Materials.

8.1.6 Objectives of Resource Management and Planning System

Objectives of the Resource Management and Planning System of Tasmania are identified in Schedule 1 of the LUPAA.

Table 13 Part 1 Objectives of the Resource Management and Planning System of Tasmania

Objectives	Response
(a) to promote the sustainable development of natural and physical resources and the maintenance of ecological processes and genetic diversity; and	The renewable energy project maximises the potential of wind as a renewable energy resource while ensuring, through the siting and design, that potential habitat for threatened species, threatened native vegetation communities and waterways including the associated riparian areas will be avoided as necessary to ensure the ecological processes and genetic diversity is maintained. Subject to further details and studies the Project can further this objective.
(b) to provide for the fair, orderly and sustainable use and development of air, land and water; and	The renewable energy project maximises the potential of wind as a renewable energy resource in a relatively isolated location, particularly in terms of sensitive uses and other potential land use conflicts. Moreover, the Project Site is in the north-west of Tasmania, which is the region first being explored for a Tasmanian renewable energy zone. While the Project Site is predominantly public land, ongoing public access including for recreational purposes can continue to be facilitated. There are also potential long-term energy security benefits by utilising public land for energy generation, continuing the long tradition in Tasmania established through the hydro-electric system. Subject to further Project details and technical studies the Project can further this objective.
(c) to encourage public involvement in resource management and planning; and	This is primarily achieved through the legislative assessment process. That said, the Project will encourage public involvement in resource management and planning including through a proactive consultation approach as outlined in

Objectives	Response
	Section 10. Further detailed studies in the impact study phase of the Project will include a 'place-based design and opportunity review' whereby, through consultation, opportunities and impacts of the Project will be explored further to assist with information design and maximise the benefits of the Project for Tasmanians.
(d) to facilitate economic development in accordance with the objectives set out in paragraphs (a), (b) and (c); and	The Project will bring significant investment in the north-west region during development and operation. The total expenditure in the construction phase is over $5 bn, generating more than 170 construction jobs and around 16 FTE per annum for the maintenance and operations of Stage 1 of the wind farm. Jobs will more than double for subsequent stages. Operational jobs for the full project are estimated at 160 FTE per annum for a 30-year life of the wind farm. The scale of Whaleback Ridge Renewable Energy Project has the ability to drive innovation in Tasmania, including advanced manufacture and assembly of turbines. The Project will provide significant opportunities for employment and diversification for the regional economy. Subject to further details and studies, the Project can further this objective of facilitating significant economic development in accordance with (a), (b) and (c).
(e) to promote the sharing of responsibility for resource management and planning between the different spheres of Government, the community and industry in the State.	All spheres of government will be involved in the assessment of the Project should the Project be determined a major project. The Project through the major project approval process will further this objective.

Table 14 Objectives of the planning process established by LUPAA

Objectives	Response
(a) to require sound strategic planning and co-ordinated action by State and local government; and	The Tasmanian Government has set a Tasmanian Renewable Energy Target (TRET) to double the state's renewable energy production and reach 200%. The plans for Tasmania include expanding the renewable energy export capacity to be used on mainland Australia by an additional 750 MW interconnector (Marinus Link) and to build new industries that use the renewable energy resource within the state. Furthermore, the Tasmanian Government announced that north-west Tasmania has been selected to be the first Tasmanian Government renewable energy zone for development in the State. The Project is consistent with and supports these strategic targets, demonstrating sound strategic planning.
(b) to establish a system of planning instruments to be the principal way of setting objectives, policies and controls for the use, development and protection of land; and	The preliminary assessment undertaken in section 8.1.4 of the regional land use strategy and the planning scheme has determined that, subject to further details and supporting technical studies, the Project will be consistent with this objective.
(c) to ensure that the effects on the environment are considered and provide for explicit consideration of social and economic effects when decisions are made about the use and development of land; and	Detailed preliminary investigations have been undertaken of the environmental values of the Project Site as well as a preliminary assessment of the economic impact of the proposal on the west coast community. On balance, both preliminary investigations determined a social and economic positive effect while mitigating or minimising effects on environmental values and social values being achievable through more detailed siting and

Objectives	Response
	design, together with further consideration of housing and social infrastructure requirements more broadly for the west coast. Further assessment of the effects on the environment will be undertaken in the major project impact statement.
(d) to require land use and development planning and policy to be easily integrated with environmental, social, economic, conservation and resource management policies at State, regional and municipal levels; and	The Project will further this objective through the assessment pursuant to section 60 of the Act under the major project process.
(e) to provide for the consolidation of approvals for land use or development and related matters, and to co-ordinate planning approvals with related approvals; and	The Project will further this objective through the assessment pursuant to section 60 of the Act under the major project process.
(f) to promote the health and wellbeing of all Tasmanians and visitors to Tasmania by ensuring a pleasant, efficient and safe environment for working, living and recreation; and	Preliminary considerations for the Project have included the significant employment opportunities, the current users of the Project Site and the proximity of the Project Site to sensitive users and nearby users more generally. The major project impact statement will provide more detailed assessment of this objective; notwithstanding, the preliminary considerations have found that the Project will satisfy this objective.
(g) to conserve those buildings, areas or other places which are of scientific, aesthetic, architectural or historical interest, or otherwise of special cultural value; and	A search of a number of historic registers and databases was undertaken by CHMA to determine the extent of historic sites and features in the vicinity of the Project Site. One heritage listed feature was identified within the Project Site – the Carn Brea Tin Mine. Given the nature of the Project, the specific location and management of infrastructure can be adjusted to avoid any direct impact. Subject to the siting and design of the infrastructure, the Project will further this objective.
(h) to protect public infrastructure and other assets and enable the orderly provision and co-ordination of public utilities and other facilities for the benefit of the community; and	The Project Site is in the north-west of Tasmania, which has been chosen by the State Government as a first REZ to coincide with the commissioning of Marinus Link and the potential to deliver the energy generation needed to develop an export-scale hydrogen sector and other future industries around the start of the next decade. The Project is likely to further this objective.
(i) to provide a planning framework which fully considers land capability.	The rural resource zoned land generally aligns with PTPZ and FPPF land. This PTPZ land is managed by Sustainable Timber Tasmania for forest products; as outlined under Section 3.4, the dominant vegetation group within the Project Site is moorland, sedgeland and rushland (including buttongrass plains); that is, vegetation types that do not contribute to the production and sale of forest products. FPPF land is Crown land, managed by Parks and Wildlife Service. An assessment has been undertaken in Table 16, with the Project found to be consistent with the objectives for management of the FPPF. The Project will further this objective.

8.2 National Parks and Reserves Management Act 2002

The Project Site includes the Mount Heemskirk Regional Reserve and the Meredith Range Regional Reserve. Regional reserves are determined under the *Nature Conservation Act 2002*, with the values of regional reserve land identified as an area of land:

a. With high mineral potential or prospectivity; and

b. *Predominantly in a natural state.*

The purpose of a regional reserve as identified in the *Nature Conservation Act 2002* is:

> *Mineral exploration and the development of mineral deposits in the area of land, and the controlled use of other natural resources of that area of land, including special species timber harvesting, while protecting and maintaining the natural and cultural values of that area of land.*

The declaration of a major project does not inhibit mineral developments from obtaining licences and leases under the *Mineral Resources Development Act 1995,* and as outlined in Table 15, there are opportunities for mineral exploration and renewable energy to harmoniously exist while using both types of natural resources and protecting the natural and cultural values of the land.

The specific location and management of infrastructure are likely able to be adjusted to avoid any direct impact on potential habitat for threatened species, threatened native vegetation communities and waterways including the associated riparian areas, together with Aboriginal heritage and historic heritage. Further studies informing the final design layout will be prepared accordingly. Having a wind farm in the Project Site, which is recognised as having a world class wind resource, is consistent with the purpose of a regional reserve. It is also important to acknowledge that there are potential long-term energy security benefits by utilising public land for energy generation, continuing the long tradition in Tasmania established through the hydro-electric system.

Neither reserve has a management plan. Accordingly, to determine the appropriateness of a use and development in a reserve, the use or development must be assessed against the objectives of management for the reserved land, as outlined in Schedule 1 of the *National Parks and Reserves Management Act 2002*.

For a regional reserve the objectives are outlined in Table 15.

Table 15 Objectives for management of reserved land – regional reserve

Objective	Project response
(a) to provide for mineral exploration activities and utilisation of mineral resources;	The declaration of a major project does not inhibit mineral developments from obtaining licences and leases under the *Mineral Resources Development Act 1995;* similarly, it does not inhibit activities from obtaining approvals under the *Land Use Planning and Approvals Act 1993*. It is recognised that areas of the west coast are considered to be highly prospective for mineral resources. In the Project Site there are some exploration licence areas but no mining leases. Engagement with exploration licence holders has indicated a long lead time for feasibility assessment, with minimal active exploration activities. Determining the feasibility of mining activities in the Project Site is therefore expected to take many years and will allow both mining and renewable energy activities to occur on the land. The Project footprint will progressively be refined and ultimately the operational footprint will occupy only approximately 1% of the Project Site. New exploration technology is also available that enables ongoing exploration, even if there is an operational wind farm in the area causing electromagnetic interference for traditional exploration phase one fly over and phase two drilling activities. Examples include technology such as Fleet Space or Idion, which use cosmic rays to 3D map underground resources to detect geological anomalies. This new technology also assists with the limited supply of drilling rigs available in Tasmania. WRE has engaged with all major mineral exploration licence holders and miners in the area. That engagement has identified that the exploration schedule is unlikely to be completed before turbine location has been confirmed through impact assessments. The engagement has also identified that while there are some mineralised areas, no Tier 1 mining companies are currently involved in exploration of the area. Overall, the Project will **not** sterilise the land for mineral exploration and mining activities. This is being demonstrated across Australia. Examples include Silverton in NSW, where AGL has developed a wind farm of up to 167 wind turbines in the Broken Hill silver deposit area that provides energy into the electricity grid, and the Agnew Gold Mine in NSW, which has recently installed wind turbines to assist with its own energy needs. It is also

Objective	Project response
	worth noting one of NSW's key renewable energy zones being progressed through an agreed State and Commonwealth strategy – the Hunter Central Coast Renewable Energy Zone – is also in an area with significant mining activity. The proponent intends to continue liaising and consulting with exploration licence holders (see Section 10) and will consider new geological data as it comes to light in the Project development phase. There is also potential for productive collaboration between renewable energy and mineral development on the same site or in proximity. This has been demonstrated elsewhere in Australia. Opportunities include collaboration over community benefit initiatives, including an accommodation and housing strategy for industries on the west coast. The Project is therefore consistent with this objective. The Project aims to further this objective through providing opportunity for the mining industry to progress with decarbonisation and will work during the impact studies phase to consider how the Project could further assist in the provision of access to mineral exploration and mineral development activities.
(b) to provide for the controlled use of other natural resources including special species timber harvesting;	Wind is a natural resource on the Project Site. The Project Site is recognised as having a world class wind resource, which is proven by the success of the nearby Granville Harbour Wind Farm. Four meteorological monitoring masts have been installed in the Project Site and the first period of data continues to reinforce the high quality of the wind resource. The Project is therefore considered consistent with this objective. The Project will not prevent use of other natural resources including special species timber harvesting.
(c) to conserve natural biological diversity;	The Project is proposed as part of a global effort needed to achieve net zero carbon emissions by 2050. To conserve biodiversity from the most catastrophic loss that will occur from the effects of climate change, renewable energy projects like this Project are required (IUCN, 2021). The proponent understands that transition to renewable energy that avoids harm and contributes to nature conservation is essential. As such significant effort has been undertaken by the proponent to conduct natural values surveys early and select a Project Site that presents a low risk of impacts on threatened species. The siting and design of Project infrastructure will further be informed by detailed onsite assessments of potential habitat for threatened species and threatened native vegetation communities. Areas of potential habitat for threatened species, as well as waterways and associated riparian areas, will be avoided as necessary to ensure the natural biological diversity will be conserved. The Project is consistent with this objective and further studies will be conducted during the impact assessment phase with an aim to provide further details on the consistency with this objective and the activities that will be undertaken to further the conservation of natural biological diversity.
(d) to conserve geological diversity;	There are seven geoconservation sites mapped within the Project Site. These sites vary from small, localised features to large landscape-scale sites (e.g. Western Tasmanian Blanket Bogs) and have varying levels of sensitivity and significance (from district through to global level significance). Investigations will be undertaken to further characterise the geomorphological features within the Project Site, and the Project will be designed to avoid areas of high significance where practicable. The Project will be able to be conducted in a manner that conserves geological diversity and is consistent with this objective. Further details of the Project being consistent with this objective will be provided at the next stage of the assessment process.
(e) to preserve the quality of water and protect catchments;	Conceptual turbine layouts have been completed, factoring in site conditions that consider hydrology, including catchments and riparian zones. Further impact studies will guide the micro-siting of turbines to ensure the preservation of water quality and catchment protection.

Objective	Project response
	The Project will be able to be conducted in a manner that is consistent with this objective. Further details of the Project being consistent with this objective will be provided at the next stage of the assessment process.
(f) to conserve sites or areas of cultural significance;	Regarding Aboriginal cultural heritage, the findings of previous archaeological investigations undertaken, together with the AHR search results, indicate the most likely site types to be encountered within the Project Site will be artefact scatters/isolated artefacts. Site density is likely to be comparatively low and concentrated on the coast. Hut depressions, rock engravings and Aboriginal stone quarries have also been recorded on the coast in the general surrounds of Granville Harbour, outside the Project Site, and therefore it is identified as being possible, although unlikely, that these site types may also be encountered. Consultation with Aboriginal community groups has commenced and will be ongoing throughout the planning and approvals phase of the Project to understand the effects on cultural landscape values and to ensure impacts are avoided or minimised. A search of a number of historic registers and databases was undertaken to determine the extent of historic sites and features in the vicinity of the study area. One historic heritage listed feature was identified within the Project Site – the Carn Brea Tin Mine. The heritage feature is permanently registered on the Tasmanian Heritage Register. Given the nature of the Project, the specific location and management of infrastructure can be adjusted to avoid any direct impact on Aboriginal heritage and historic heritage. The Project will be able to be conducted in a manner that conserves sites and areas of cultural significance, and further studies will inform the final design layout accordingly. The Project will also provide an opportunity to further this objective by identifying areas of significance and/or improving on the conservation programs for existing known sites of significance, for example improved land management opportunities and programs along coastlines of known heritage sites in the vicinity.
(g) to encourage education based on the purposes of reservation and the natural or cultural values of the regional reserve, or both;	The Project will further this objective by creating opportunity to encourage education around reserve management and renewable energy. The natural and cultural values of the reserve will be better understood and studied through the impact assessment studies for the Project and will provide opportunity to develop educational programs. Further details of the Project being consistent with this objective will be provided at the next stage of the assessment process.
(h) to encourage research, particularly that which furthers the purposes of reservation;	The Project offers significant opportunity through its scale for collaborative research to further the purpose of the reservation. Significant new studies have already been completed by WRE on the Project Site for threatened species that contribute to the State database for research of natural values. There are further opportunities that will be explored in relation to encouraging research into natural values on the Project site. Further details of the Project being consistent with this objective will be provided at the next stage of the assessment process.
(i) to protect the regional reserve against, and rehabilitate the regional reserve following, adverse impacts such as those of fire, introduced species, diseases and soil erosion on the regional reserve's natural and cultural values and on assets within and adjacent to the regional reserve;	The Project will further this objective. The Project through the next stage of the assessment will include details about construction management, management of hazardous substances on site, biosecurity protocols and so forth. The Project offers significant opportunity to collaborate and assist with land management initiatives such as fire management, weed management and rehabilitation of existing adverse impacts (such as erosion along coastal tracks). Further details of the Project being consistent with this objective will be provided at the next stage.
(j) to encourage tourism, recreational use and enjoyment consistent with	Existing recreational land uses within the Project Site include four-wheel driving, mountain bike riding, camping, bushwalking, firewood collection and boating and fishing. The Project is consistent with this objective and

Objective	Project response
the conservation of the regional reserve's natural and cultural values;	will provide opportunity to further this objective by encouraging tourism access to enjoy the reserve. There are opportunities for the Project to provide for increased access and facilities that could benefit the recreational and tourism use of the reserve. Further details of the Project being consistent with this objective will be provided at the next stage of the assessment process.
(k) to encourage cooperative management programs with Aboriginal people in areas of significance to them in a manner consistent with the purposes of reservation and the other management objectives;	The Project is consistent with this objective. The Project will provide the opportunity to encourage cooperative management programs with Aboriginal people. In particular there is opportunity to increase resourcing for management and protection of areas of land with significance. Further details of the Project being consistent with this objective will be provided at the next stage of the assessment process.
(l) to provide for the taking, on an ecologically sustainable basis and where appropriate, of designated game species for commercial or private purposes, or both.	The Project will not prevent this objective being furthered.

8.3 Permanent timber production zone land

Permanent timber production zone land is Crown land managed by Sustainable Timber Tasmania as defined in the *Forest Management Act 2013*. Sustainable Timber Tasmania manages around 800,000 hectares of PTPZ land across Tasmania, which entails undertaking forest operations for the production and sale of forest products from these forests (including making available at least 137,000 cubic metres of high-quality eucalypt sawlogs and veneer logs per annum).

As outlined under Section 4.5.1, the dominant vegetation group within the Project Site is moorland, sedgeland and rushland (including buttongrass plains); that is, vegetation types that that do not contribute to the production and sale of forest products. There may be some clearance required of trees due to ancillary infrastructure requirements, such as access tracks; however, this will be limited as far as practicable.

All forested land within the Project Site has been included in the turbine exclusion zone. Adjustment of forested areas for linear infrastructure within the turbine exclusion zones of the PPTZ is expected to be minimal and will be studied further once infrastructure locations are finalised during the impact assessment phase.

8.4 Future potential production forest

Land identified as future potential production forest (FPPF) is Crown land managed by the Tasmania Parks and Wildlife Service pursuant to section 4(2) of the *Forestry (Rebuilding the Forest Industry) Act 2014*; no native forest harvesting can be undertaken on the land. The management objectives for FPPF land are identified in Schedule 3 of the *Forestry (Rebuilding the Forest Industry) Act 2014*.

Table 16 Objectives for management of future potential production forest land

Objective	Project response
(a) to conserve natural biological diversity	The Project, through its siting and design, will avoid potential habitat for threatened species, threatened native vegetation communities, and waterways including the associated riparian areas, as necessary to ensure the natural biological diversity will be conserved. Further details of the Project being consistent with this objective will be provided at the next stage of the assessment process.

Objective	Project response
(b) to conserve geological diversity;	There are seven geoconservation sites mapped within the Project Site, which includes areas identified as FPPF. These sites vary from small, localised features to large landscape-scale sites (e.g. Western Tasmanian Blanket Bogs and Eureka Dolerite Cone Sheet). They have varying levels of sensitivity and significance (from district- through to global-level significance). Investigations will be undertaken to further characterise the geomorphological features within the site, and the Project will be designed to avoid areas of high significance where practicable. Further details of the Project being consistent with this objective will be provided at the next stage of the assessment process.
(c) to preserve the quality of water and protect catchments;	Conceptual turbine layouts have been completed, factoring in hydrological conditions, including catchments and riparian zones. Further impact studies will guide the micro-siting of turbines to ensure the preservation of the quality of water and catchment protection. Further details of the Project being consistent with this objective will be provided at the next stage of the assessment process.
(d) to conserve sites or areas of cultural significance;	The findings of previous archaeological investigations undertaken, together with the AHR search results, indicate the most likely site types to be encountered within the Project Site will be artefact scatters/isolated artefacts. Site density is likely to be comparatively low and concentrated along the coast. Hut depressions, rock engravings and Aboriginal stone quarries have also been recorded in the general surrounds of Granville Harbour on the coast and therefore it is identified as being possible, although less likely, that these site types may also be encountered. Regarding historic heritage, a search of a number of historic registers and databases was undertaken to determine the extent of historic sites and features in the vicinity of the study area. One heritage listed feature was identified within the Project Site – the Carn Brea Tin Mine. Given the nature of the Project, the specific location and management of infrastructure can be adjusted to avoid any direct impact on Aboriginal heritage and historic heritage. Further studies will inform the final design layout accordingly.
(e) to encourage education and research, consistent with the land's natural and cultural values;	The Project offers significant opportunity through its scale for collaborative education and research to further the objectives. Significant new studies have already been completed by WRE on the Project Site about threatened species, which contribute to the State database for research of natural values. There are further opportunities to encourage research into natural values on the Project site that will be explored. Further details of the Project being consistent with this objective will be provided at the next stage of the assessment process.
(f) to protect the future potential production forest land against, and rehabilitate that land following, adverse impacts such as those of fire, introduced species, diseases and soil erosion on that land's natural and cultural values and on assets within and adjacent to that land;	The Project will not prevent this objective being furthered. The Project through the next stage of the assessment will include details around construction management, management of hazardous substances on site, biosecurity protocols and so forth.

Objective	Project response
(g) to encourage tourism, recreational use and enjoyment consistent with the conservation of the land's natural and cultural values;	Existing recreational land uses within the Project Site include four-wheel driving, mountain bike riding, camping, bushwalking, firewood collection and boating and fishing. The Project is consistent with this objective and will provide opportunity to further this objective by encouraging tourist access to enjoy the land. There are opportunities for the Project to provide for increased access and facilities that could benefit the recreational and tourism use of the land. Further details of the Project being consistent with this objective will be provided at the next stage of the assessment process.
(h) to encourage cooperative management programs with Aboriginal people in areas of significance to them in a manner consistent with the other management objectives;	The Project is consistent with this objective. The Project will provide the opportunity to encourage cooperative management programs with Aboriginal people. In particular there is opportunity to increase resourcing for management and protection of areas of land with significance. Further details of the Project being consistent with this objective will be provided at the next stage of the assessment process.
(i) to provide for the taking, on an ecologically sustainable basis, of designated game species for commercial or private purposes, or both	The Project will not prevent this objective being furthered. Further details of the Project being consistent with this objective will be provided at the next stage of the assessment process.
(j) to provide for the controlled use of natural resources including special species timber harvesting;	Wind is a natural resource on the Project Site. The Project Site is recognised as having a world class wind resource, which is proven by the success of the nearby Granville Harbour Wind Farm. Four meteorological monitoring masts have been installed in the Project Site and the first period of data continues to reinforce the high quality of the wind resource. The Project is therefore considered consistent with this objective. The Project will not prevent use of other natural resources including special species timber harvesting.
(k) to provide for exploration activities and utilisation of mineral resources;	The declaration of a major project does not inhibit mineral developments from obtaining licences and leases under the *Mineral Resources Development Act 1995*; similarly, it does not impact on mineral development activities from obtaining approvals under the *Land Use Planning and Approvals Act 1993*. Noting the approval of the Heemskirk Wind Farm development provides precedent for this position. Moreover, there is potential for productive collaboration between low-cost renewable energy and mineral development on the same site or in proximity. Further details of the Project being consistent with this objective will be provided at the next stage of the assessment process.
(l) to allow for private, commercial or industrial uses.	This objective allows for the use of the land by a private proponent proposing a renewable energy project. The Project is consistent with this objective.

8.5 Crown land

There is an area of land that is identified as Crown land that is not part of a regional reserve, PTPZ or FPPF. Parks and Wildlife Service manages this Crown land in accordance with the *Crown Lands Act 1976*. It is recognised that the *Crown Lands Act 1976* is relevant to the operation of the Resource Management Planning System, and accordingly, Schedule 3 of that Act identifies the objectives of the Resource Management and Planning System of Tasmania. Table 13 and Table 14 above provide an assessment of the

Project against these objectives, which concluded that subject to further onsite assessments the Project is consistent with these objectives.

9 Consents and notifications

This section addresses the requirements of 60F(1)(n) of LUPAA.

A list of the Land Titles comprising the Project Site is provided in Section 4.3. The Project Site comprises Crown land and land managed by Hydro Tasmania and Sustainable Timber Tasmania. The status of consents and notifications for the Project is outlined below.

9.1 Crown land

Under section 60P(2)(a) of LUPAA, where the project is on Crown land, the Minister for Planning may only declare a project to be a major project with the consent of the relevant Minister who administers the Crown land.

The Department of Natural Resources and Environment Tasmania has been notified and requested to facilitate Crown Land Consent pursuant to section 60P(2)(a) of the Act (see Appendix F). After discussion with the Office of the Coordinator-General, this MPP is submitted alongside the request for Crown Land Consent, on the understanding the MPP will precipitate the consent process and the matter of Crown Land Consent will be considered ahead of any subsequent declaration of a major project.

9.2 Hydro Tasmania

Hydro Tasmania has been briefed on the Project and provided with a notification letter (see Section 10).

9.3 Sustainable Timber Tasmania

Sustainable Timber Tasmania has been briefed on the Project and provided with a notification letter (see Section 10).

10 Consultation

This section addresses the requirements of 60F(1)(o) of LUPAA.

10.1 Consultation undertaken to date

Significant stakeholder consultation with a number of key stakeholders has been undertaken from 2019 to date. A summary of consultation activities is as follows:

- Local councils in the north-west region, including West Coast Council, Burnie Council, Waratah-Wynyard Council, Circular Head Council and Kentish Council, have been briefed on the Project and provided with ongoing Project updates. Letters of support have been received from all councils and are included in Appendix A.
- A presentation was made to the Cradle Coast Authority, in addition to Project briefings. The Project is supported by the Cradle Coast Authority as a project of regional significance (CCA, 2023).
- Meetings and briefings have been held with the mineral exploration licence holders within the Project Site and neighbouring mining companies. The Project has received numerous letters of support including from CopperCorp/Georgina Resources and Spero Mining and Bluestone Mines (see Appendix A). The Mineral Exploration Cooperative Research Centre has also been briefed on the Project.
- Meetings and briefings have been held with state agencies and enterprises, including Parks and Wildlife Service (a site visit was also undertaken), EPA, Aboriginal Heritage Tasmania, Sustainable Timber Tasmania, TasNetworks (a site visit was also undertaken), Mineral Resources Tasmania, Hydro Tasmania, Renewables, Climate and Future Industries Tasmania (a site visit was also undertaken), and TasPorts. Briefings have also been undertaken with government committees including Regional Development Australia – Tasmania and the Arthur-Pieman Conservation Area Management Committee.
- Meetings and briefings have been held with industry organisations, including Tasmanian Minerals, Manufacturing and Energy Council, Advance West North West Association and other significant industry, business and community groups.
- Meetings and briefings have been held with not-for-profit organisations, including the Tarkine National Coalition (a site visit was also undertaken) and Raptor Refuge.
- Meetings and briefings have been held with community organisations, including Business North West, the Devonport Chamber of Commerce and Industry, Burnie Chamber of Commerce, No Turbine Action Group (a site visit was also undertaken) and Granville Harbour Coast Care.
- A Project briefing, site visit and communications have been undertaken with the Tasmanian State Management for Telstra.
- Meetings have been held with research and education institutions, including the University of Tasmania, University of South Australia, Adelaide University, Curtin University, TAFE and Zoos Victoria (meetings regarding orange-bellied parrot tracking program).
- Invitations have been issued for briefings and meetings with Aboriginal Community Organisations through CHMA.

In addition to the above consultation activities, multiple media releases have been published.

10.2 Proposed consultation approach

WRE will undertake further community and stakeholder engagement throughout the impact assessment phase of the Project to empower the community and stakeholders to participate and genuinely contribute to, and benefit from, the Project. The overall objectives of community and stakeholder engagement are to:

- Build a strong relationship with the community.

- Ensure benefits from the Project are shared with the community, including implementation of a profit-sharing program.
- Ensure that reserve objectives are met and that opportunities for the Project to bring value to the region are realised.
- Provide opportunities for the community and stakeholders to ask questions, provide feedback and ideas, and participate in decision-making where possible.
- Use community feedback to positively influence the development of the Project where possible.
- Provide timely responses to any community concerns.
- Build a deeper understanding of any potential impacts and how these will be mitigated and managed.
- Set clear expectations and build trust, acceptance or understanding of the Project and the development process.
- Proactively engage with land users and other key stakeholder groups and ensure best practice communication strategies are implemented throughout the Project life cycle.
- Raise community support and awareness of the Project's economic, social and environmental benefits.

A range of engagement tools and processes to support the above objectives will be undertaken including:

- Project information fact sheets
- Videos and photos of design concepts
- Face-to-face meetings
- Site visits
- Events and presentations
- Media releases
- Workshops and community reference groups
- Project phone number and email for contact
- Website.

11 Feasibility assessment

This section addresses the requirements of 60F(1)(p) of LUPAA.

The Project Site was selected as an optimum location for wind development for a number of reasons including wind resource, proximity to transmission, environmental factors, tenure classifications, constructability, remoteness from sensitive receptors, consistency with key renewable energy policies, and strategic importance for the regional economy. North-west Tasmania has been identified by AEMO in the 2020 Integrated System Plan as one of the three onshore renewable energy zones in Tasmania. The Tasmanian Government also announced that the area has been selected to be the first Tasmanian Government renewable energy zone for development in the state. The North West Renewable Energy Zone is characterised by strong and consistent westerly winds from the Roaring Forties.

Feasibility assessments relating to these aspects are discussed in Table 17 below.

Table 17 Feasibility assessments

Feasibility assessment	Response
Wind resource quality	The Project Site has access to a world class wind resource. The site selection for Whaleback Ridge Renewable Energy Project has been based on the proponent's experience, evidence from studies, and the development and operation of the neighbouring Granville Harbour Wind Farm. The performance of Granville Harbour Wind Farm, which has been operational for two years, has proven that the characteristics of the wind resource in the area are some of the best in the world. Granville Harbour Wind Farm operates at an extremely high capacity factor, making it one of the best and most consistent wind resources in Australia. The Project Site is situated adjacent to, and at a higher elevation than, Granville Harbour Wind Farm. The wind resource is expected to be either equal to or better than Granville Harbour Wind Farm, which is being confirmed by early data from four meteorological monitoring masts installed on site in early 2023.
Connection and transmission	Transmission studies have been completed with TasNetworks to identify options and constraints for connection to the network at Farrell Substation (TasNetworks, 2022). The Project will be staged to meet demand in the market and capacity on the transmission network. Stage 1 is anticipated to be 288 MW, and there is currently sufficient capacity on the existing Farrell-Reece line to transfer this electricity from the site to the Tasmanian and national energy market. As market demand increases and the wind farm stages progress, additional transmission capacity will be required to export electricity from the site, or local opportunities may arise to use the generated electricity in the local region (such as the establishment of a hydrogen production facility). These opportunities are being considered separately and will form part of separate studies underway for north-west hydrogen production. These separate studies are supported by Australian Government funding of $2.4 million and focused on development of a supply chain for hydrogen within north-west Tasmania, including consideration of transmission, transport and port facilities.
Environmental factors	The Project Site is dominated by low-lying vegetation with limited forest vegetation. This means that no tree clearing is expected to be required for turbine construction. The most important mitigation measure for environmental impact in relation to wind developments and avifauna is to ensure turbines are in areas that have a low abundance of birds. The area has been subject to avifauna surveys, with the results confirming the Project Site has the lowest bird densities and bird utilisation of any wind farm in Tasmania (Nature Advisory, 2023). Threatened species susceptible to turbine strike, such as the white-bellied sea eagle and wedge-tailed eagle, were found in low abundance within the Project Site and no active nests were found within a 3 km radius of the Project Site (Mooney, N., 2023).
Land use and tenure classification	Site selection for the Project Site was undertaken carefully to ensure the proposed wind farm is compatible with existing land uses, the existing tenure classifications, and the existing applicable zones. The Project Site was selected to exclude all areas currently under active mining leases. Ongoing exploration can be facilitated as discussed in Section 8.2 and Section 12.

Feasibility assessment	Response
Remoteness from sensitive receptors	The Project Site has been carefully selected to avoid impact on sensitive receptors. The site is remote from dwellings, minimising the risk of impact from noise and visual amenity. The turbine exclusion has been set back 3 km from any dwellings located at Trial Harbour and 1 km from shacks located at Granville Harbour and other isolated sensitive receptors.
Constructability	Conceptual turbine layouts have been completed by DNV Energy Systems, factoring in site conditions such as slope, vegetation, hydrology and environmental constraints. The conceptual layout has confirmed feasibility for at least 400 turbines within the Project Site[8]. Further impact studies will guide the micro-siting of turbines and final development layout.
Access	In terms of traffic, the effects of the Project on the surrounding traffic network will largely relate to the construction phase, noting the area has good access to sub-arterial roads with a proven transport route for turbine components from the Port of Burnie to Granville Harbour. Both the Heemskirk Road and Pieman Road run through the Project Site, with the Project Site containing many existing access tracks for mineral exploration activities. The existing track network will be utilised as far as practicable.

[8] The Project includes up to 500 WTGs; however, less turbines may be required depending on the model of WTG selected.

12 Other information

This section addresses the requirements of 60F(1)(q) of LUPAA.

12.1 Mining (Strategic Prospectivity Zones) Act 1993

The *Mining (Strategic Prospectivity Zones) Act 1993* (SPZ Act) was enacted specifically to provide security for land and resource access to address concerns from the minerals industry resulting from the creation of new reserves in 1989 (Tasmania–Commonwealth Joint Steering Committee, n.d.)

As identified in Section 8.2, a wind farm is considered consistent with the management objectives of the existing land status of regional reserve under the *Nature Conservation Act 2002*. Importantly, there is no requirement for a wind farm proposal to request a change of status for the land given that the management objectives for a regional reserve provide for both mineral exploration and the controlled use of other natural resources. Moreover, the Heemskirk Wind Farm development provides precedent for this position. This wind farm was approved in 2005 (although never constructed) on 7,000 hectares of the same regional reserve and within the same SPZ. Mineral Resources Tasmania provided advice on Heemskirk Wind Farm that, provided exploration licences and/or mining licences can still be granted within the area, the issue of a Crown lease for a wind farm is not incompatible with the objectives of a regional reserve (MRT, 2005). Further, legal advice obtained for the Project has concluded that approval requirements under the SPZ Act are not triggered by the Project, as the land will not be sold or subject to a change of status (Allens, 2019). While a 'change in status' is not expressly defined in the SPZ Act, relevant provisions of the SPZ Act and the Crown Lands Act referred to in the SPZ Act indicate that this refers specifically to a formal reservation or designation of Crown land by a Crown land manager under the Act. Therefore obtaining a lease to develop and operate the Project does not constitute a 'change in status' (Allens, 2019).There are many leases over Crown land in the SPZ, for a variety of non-mining activities, that have been entered into since the SPZ Act came into effect and which are not authorised through both Houses of Parliament.

The Project provides for the controlled use of other natural resources, which does not conflict with the mineral exploration activities and utilisation of mineral resources presently being undertaken near the Project Site. WRE has engaged with all mineral tenement holders, both exploration licence holders that coincide with the Project Site and neighbouring mining lease holders (see Figure 8). All are supportive of co-use and the potential shared benefits.

Further to the above, in the event that a change in the status of the land is considered to be required, the final lease area for the Project will be less than 500 ha and would be eligible for exception under section 4(4) of the SPZ Act (Allens, 2019).

12.2 Mineral Resources Development Act 1995

The Project provides for the controlled use of a natural resource – wind – and does not conflict with the mineral exploration activities and utilisation of mineral resources presently being undertaken on or near the Project Site. As outlined in Section 8.2:

- In the Project Site there are some exploration licence areas but no mining leases.
- The Project does not inhibit the issuing of mineral exploration licences or leases under the *Mineral Resources Development Act 1995*.
- Engagement with exploration licence holders has indicated a long lead time on feasibility assessments, with minimal current active exploration being undertaken.
- Determining feasibility on mining activities in the Project Site is expected to take many years and allows both mining and renewable energy activities to occur on the land, if mining was determined to be economically feasible.
- The Project footprint will be refined and ultimately the Project's operational footprint is expected to occupy under 500 ha (approximately 1.23%) of the Project Site.
- New exploration technology is now available that enables ongoing exploration, even if there is an operational wind farm in the area causing electromagnetic interference for traditional exploration

phase one fly over and phase two drilling activities (see Figure 17). Examples include technology such as Fleet Space or Idion, which use cosmic rays to 3D map underground resources to detect geological anomalies. This new technology also assists with the limited supply of drilling rigs available in Tasmania.

- The Project does not "sterilise" the land for mineral exploration and mining activities. This is being demonstrated across Australia. Examples include Silverton in NSW, where AGL has developed a 167 turbine wind farm in the Broken Hill silver deposit area that provides energy into the electricity grid, and the Agnew Gold Mine in NSW which has recently installed wind turbines to assist with its own energy needs. It is also worth noting that one of NSW's key renewable energy zones being progressed through an agreed State and Commonwealth strategy – the Hunter Central Coast Renewable Energy Zone – is also in an area with significant mining activity. As noted above, the Tasmanian legislation, the *Mineral Resources Development Act 1995*, allows for the issuing of a mineral exploration licence or mining lease over the Project Site regardless of existing infrastructure.
- The proponent intends to continue liaising and consulting with exploration licence holders (see Section 10) and will consider new geological data as it comes to light in the project development phase.
- There is also potential for productive collaboration between renewable energy and mineral development on the same site or in proximity. This has been demonstrated elsewhere in Australia. Opportunities include collaboration over community benefit initiatives, including an accommodation and housing strategy for industries on the west coast, and provision of renewable energy for mineral processing facilities.

Detailed consideration of the productive convergence between renewable energy and mining activities on the Project Site will be given through the next stage of the major project assessment process.

Figure 17 Airborne electromagnetic exploration technology (Southern Geoscience Consultants, 2023)

12.2.1 Crown land leases

In addition to the ability for a renewable energy project and utilisation of mineral resources to coexist, it is also relevant to note that wind farm project leases are typically limited to defined areas (where wind turbines and other infrastructure are installed), rather than covering larger tracts of land. It is expected the final lease footprint for the Project will be under 500 ha. The Crown land leases will cover defined and relatively small areas of land specifically used for Project infrastructure. These leases will not prevent the grant of mining or exploration interests in the area in the future. In the event that a mining lease is proposed near or under Project infrastructure, any necessary modifications to Project infrastructure would be managed no differently to any other case, in that the rights for mineral exploration licences and mining leasing processes under the MRD Act would continue to prevail.

12.3 Commonwealth Environment Protection Biodiversity Conservation Act 1999

This section addresses the requirements of 60F(1)(k) of LUPAA.

The Project is likely to require assessment and approval under the EPBC Act based on its scale and the potential for impacts to matters of national environmental significance, including listed threatened species and ecological communities, listed migratory species and cultural landscapes.

To address this matter, the Project will be referred to the Commonwealth Minister for the Environment, independently of the major project pathway. The estimated timeframe for lodgement of the referral is late 2023.

In the event of a controlled action decision by the Commonwealth, the Project does not intend to seek to apply Tasmania's bilateral agreement for environmental assessments and will address EPBC Act matters separately and in parallel.

13 References

ABS. (2011). *West Coast (M) 2006 Census All persons Quick Stats*. Retrieved from Australian Bureau of Statistics: https://www.abs.gov.au/census/find-census-data/quickstats/2011/LGA65610

ABS. (2021). *West Coast 2021 Census All persons QuickStata*. Retrieved from Australian Bureau of Statistics: https://www.abs.gov.au/census/find-census-data/quickstats/2021/LGA65610

ABS. (2021). *West Coast 2021 Census All persons QuickStats*. Retrieved from Australian Bureau of Statistics: https://www.abs.gov.au/census/find-census-data/quickstats/2021/LGA65610

AEMO. (2022, June). *2022 Integrated System Plan For the National Electricity Market*. Retrieved from Australian Energy Market Operator: chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://aemo.com.au/-/media/files/major-publications/isp/2022/2022-documents/2022-integrated-system-plan-isp.pdf?la=en

Allens. (2019, September 9). Application of the SPZ to Project Renewable Future.

CASA. (2023). *Aerodromes*. Retrieved from Civil Aviation Safety Authority: https://www.casa.gov.au/search-centre/aerodromes?search_api_fulltext=&field_dt_effective%5Bmin%5D=&field_dt_effective%5Bmax%5D=&sort_by=title&sort_order=ASC&field_tx_state_territory%5B%5D=167

CCA. (2023, January 17). *Whaleback Ridge Renewable Energy Project Supported by CCA as Project of Regional Significance*. Retrieved from Cradle Coast Authority: https://www.cradlecoast.com/wp-content/uploads/2023/01/WHALEBACK-RIDGE-RENEWABLE-ENERGY-PROJECT-regional-significance.pdf

CHMA. (2023). *Project Renewable Future - Granville Harbour*. Cultural Heritage Management Australia.

Clean Energy Council. (2018). *Best Practice Guidelines for Implementation of Wind Energy Projects in Australia*.

DCCEEW. (2021, October 10). *National Heritage Places - Western Tasmania Aboriginal Cultural Landscape*. Retrieved from Location and boundary map: https://www.dcceew.gov.au/parks-heritage/heritage/places/national/western-tasmania

DCCEEW. (2023). *Conservation advice for Neophema chrysotoma (blue-winged parrot)*. Department of Climate Change, Energy, the Environment and Water .

Department Climate Change, Energy, the Environment and Water. (2023, June 27). *National heritage list*. Retrieved from National Heritage Places - Western Tasmania Aboriginal Cultural Landscape: https://www.dcceew.gov.au/parks-heritage/heritage/places/national/western-tasmania

Department of State Growth. (2020). *Tasmanian Renewable Hydrogen Action Plan*. Tasmanian Government.

Department of Treasury and Finance. (2022). *Population projections for Tasmania and its Local Government Areas - Interim Rebased Population Projection Outputs*. Retrieved from Department of Treasury and Finance: https://www.treasury.tas.gov.au/economy/economic-data/2019-population-projections-for-tasmania-and-its-local-government-areas

DNV Energy Systems. (2022). *St Patricks Plains Wind Farm Shadow Flicker Assessment*.

DSG. (2021). *Draft Renewable Energy Coordination Framework*. Retrieved from https://www.stategrowth.tas.gov.au/__data/assets/pdf_file/0020/311429/Draft_Renewable_Energy_Coordination_Framework.pdf

Griffiths, T. (2019). *Re Proposed West Coast Wind Farm Anemometers*. Airports Plus Pty Ltd.

IUCN. (2021). *Mitigating biodiversity impacts associated with solar and wind energy development - Guidelines for project developers* . International Union for Conservation of Nature and Natural Resources.

LISTmap. (2023, May 15). *LISTmap - Land Information System Tasmania*. Retrieved from https://maps.thelist.tas.gov.au/listmap/app/list/map

Mooney, N. (2023). *Whaleback Ridge Renewable Energy Project: Preliminary Searches for Eagle Nests*.

MRT. (2005, January 17). Letter from Carol Bacon (Industrial Minerals and Land Management) to Shane Breen (Department of Tourism, Heritage and the Arts). *Proposed Heemskirk Wind Farm*. Department of Infrastructure Energy and Resources - Mineral Resources Tasmania.

Nature Advisory. (2021). *Whaleback Ridge Wind Farm - Summary of bird utilisation, raptor and orange-bellied parrot surveys*. Nature Advisory.

Nature Advisory. (2023). *Whaleback Ridge Renewable Energy Project Bird and Bat Assessments*. Hawthorn East: Nature Advisory.

Nature Advisory. (2023). *Whaleback Ridge Renewable Energy Project Desktop Flora and Fauna Assessment*. Hawthorn East.

Nature Conservation Branch. (2003). *Conservation of Tasmanian Plant Species and Communities threatened by Phytophthora cinnamomi*. Department of Primary Industries, Water and Environment.

NRE Tas. (2023, September 28). *Geodiversity - Geosite Search*. Retrieved from Natural Values Atlas: https://www.naturalvaluesatlas.tas.gov.au/#GeodiversityHomePage

NRE Tas. (2023). *Natural Values Atlas Report*.

SGS Economics & Planning. (2023). *Preliminary Economic Review of Major Project Proposal for Whaleback Ridge Renewable Energy Project*.

Southern Geoscience Consultants. (2023).

Tasmania–Commonwealth Joint Steering Committee. (n.d.). *Options for the Tasmania–Commonwealth Regional Forest Agreement: a strategic approach*. Retrieved from https://www.awe.gov.au/sites/default/files/sitecollectiondocuments/rfa/regions/tas/directions-options/test.pdf

Tasmanian Government. (2022, December 1). *Jeremy Rockliff Premier of Tasmania*. Retrieved from Guy Barnett, Minister for Energy and Renewables: https://www.premier.tas.gov.au/site_resources_2015/additional_releases/big-step-towards-tasmanias-first-renewable-energy-zone

TasNetworks. (2022). *Transmission Corridors Options Study - Whaleback Ridge Wind Farm*.

Appendix A Letters of support

SENATOR THE HON. JONNO DUNIAM

Assistant Minister for Forestry and Fisheries
Assistant Minister for Industry Development
Deputy Manager of Government Business in the Senate
Liberal Senator for Tasmania

The Hon. Peter Gutwein MP
Premier
Treasurer
Minister for Climate Change
Minister for Tourism

peter.gutwein@dpac.tas.gov.au

Dear Premier, Peter,

I have become aware of some recent developments with Westcoast Renewable Energy Pty Ltd (WRE) that prompt me to write and offer the Federal Government's assistance to progress the project.

As you know, this project holds the potential to be transformative for the regional economies of the west and north-west coasts of Tasmania, bringing investment and green energy jobs.

WRE have secured commercial partners that gives them further capability to undertake the project. As well as alleviating commercial risk, WRE have taken technical risk out of the project by analysing transmission options and environmental factors that confirm the attractiveness of the site.

WRE have also engaged with local communities and the mining sector on the west coast who are supportive of the venture – they have signed an MoU to explore co-operation with local miners in relation to both the use of power from the wind farm and the production of green hydrogen. I would be happy to link your office up with Alan Bradford from WRE to confirm this.

These developments reflect good progress and I know the WRE team are now able to accelerate into the next phase of the project's development.

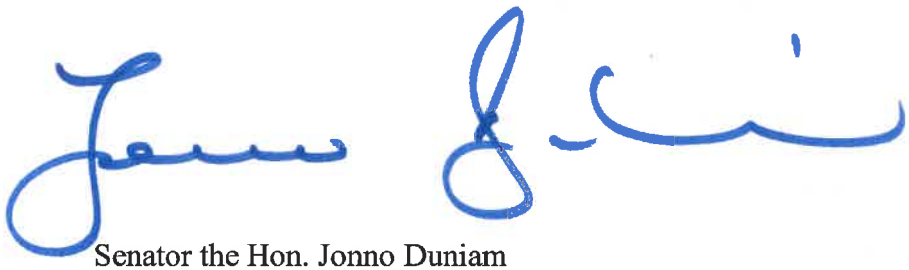
I have written in support of the project to the Minister for Industry, Energy and Emissions Reduction, the Hon. Angus Taylor MP, recommending the project be considered for support by the Major Projects Facilitation Agency. This could assist to bring together various approvals related work streams, provide for a seamless interaction between Commonwealth and State requirements, and shorten the overall time needed to bring the project to market.

I am pleased to be able to support a Tasmanian project undertaken by a Tasmanian company that will aid our state's emissions reduction.

85 Macquarie Street, Hobart TAS 7000 **Post** GPO Box 453 Hobart TAS 7001 **Phone** (03) 6231 2444
Email Senator.Duniam@aph.gov.au **Web** www.duniam.com.au **Facebook** SenatorDuniam

If there is any way that the Federal Government can support this project, then I would be happy to be of assistance.

Sincerely



Senator the Hon. Jonno Duniam
Liberal Senator for Tasmania
25 March 2022

Cc: The Hon. Michael Ferguson MP

85 Macquarie Street, Hobart TAS 7000 **Post** GPO Box 453 Hobart TAS 7001 **Phone** (03) 6231 2444
Email Senator.Duniam@aph.gov.au **Web** www.duniam.com.au **Facebook** SenatorDuniam

WARATAH WYNYARD COUNCIL

Enquiries: Sally Blanc
Phone: (03) 6443 8311
Our Ref: 009.52

22 July 2022

To whom it may concern.

Dear Sir/Madam,

RE: WHALEBACK RIDGE ENERGY PARK

Waratah-Wynyard Council notes the proposed development of the Whaleback Energy Park (WEP) by West Coast Renewable Energy (WRE).

Council has been briefed on the WEP and has followed its progress with great interest. The project will provide great opportunity for jobs of the future in our region. The West and Northwest of the state needs greater economic diversity and this project will assist in meeting the goals of Council and the region.

Our region is home to tremendous sources of renewable energy. We also have local infrastructure and services that are able to support the project, and who will benefit greatly from this once in a generation opportunity, creating new jobs throughout the supply chain.

The Council is very aware of public sentiment around project proposals for windfarms. We note that the proponents have collected significant environment related data to enable them to broaden the engagement with the wider community and Council looks forward to working with WRE as they progress and ensure statutory obligations are met.

This project supports development of infrastructure within the region and provides benefits that extend beyond Council boundaries. Projects of such regional and state significance are in line with the principles of the Sustainable Murchison Community Plan 2040 and help to ensure future environmental sustainability and develop new jobs and industries for the next generation.

Yours sincerely

Robby Walsh
MAYOR

Waratah Wynyard Council
21 Saunders Street (PO Box 168) Wynyard Tasmania 7325
P: (03) 6443 8333 | F: (03) 6443 8383 | E: council@warwyn.tas.gov.au

BUSINESS NORTHWEST

Promoting Regional Growth

PO Box 139
BURNIE
TAS. 7320

12 July 2022

To Whom it may Concern

RE: Whaleback Ridge Energy Park

Business Northwest is pleased to provide a letter of support for this exciting project. We have had several detailed briefings over the last two years and firmly believe this project to be of regional significance to North West Tasmania and indeed the entire state. We have met with the main proponents and have visited the Granville Harbour project and are extremely impressed with the group's determination to deliver such a large project.

The project fits perfectly within the renewable energy mandate of the state government and the scale makes it of international importance. The employment opportunities stemming from the project will last for generations and bring long term benefits for local businesses across the entire region.

The project is not only a great, long-term revenue producer but will provide a major contribution to tackling climate change further enhancing our state's RE reputation. This is a large, locally developed project that has the ability to attract new industries to Tasmania and grow the state's economy.

We fully support this project and look forward to Tasmania reaping the rewards it will bring.

Yours sincerely

Ian C Jones

Ian Jones
PRESIDENT

PLEASE QUOTE

Your Ref:

Our Ref 15/6/5

Enquiries SK:SO

80 Wilson Street, Burnie Tasmania
PO Box 973, Burnie TAS 7320

ABN: 29 846 979 690
Phone: (03) 6430 5700
Email: burnie@burnie.tas.gov.au
Web: www.burnie.tas.gov.au

We value your feedback on our service.
Tell us about it at www.burnie.tas.gov.au

BURNIE CITY COUNCIL

19 July 2022

Hon Jeremy Rockliff MP
Premier of Tasmania
GPO Box 123
HOBART TAS 7001

Email: premier@dpac.tas.gov.au
A hard copy will be sent

Dear Premier

Letter of Support for Whaleback Ridge Energy Park

Burnie City Council has received a number of briefings about the Whaleback Ridge Energy Park from Westcoast Renewable Energy Pty Ltd and is strongly supportive of this project proceeding.

This project is a 'game changer' for the region. It will have a direct benefit on our region's economic and social conditions. For example, I note the strong intent to deliver local jobs and maximise the input of the local business community. Similarly, we know from the construction of the Granville Harbour Wind Farm that the indirect benefit to the local community is substantial.

The west and northwest regions need greater economic diversity and this project orientates our region towards future industry. Our region offers tremendous sources of renewable energy and we also have local infrastructure and services that are able to support the project and who will benefit greatly from this once in a generation opportunity.

The Council is very aware of public sentiment around major project proposals. The proponents are acutely aware of this as well and we note the significant environment related data they have obtained. We agree this is an important basis to then broaden the engagement with the wider community and look forward to working with WRE as they progress.

Westcoast Renewable Energy are a great example of the bold and positive thinking needed to realise this potential. It is also great to see a Tasmanian company taking on the challenge. As such, Burnie City Council is supportive of the project and we look forward to seeing the potential of this project realised.

Yours faithfully

Cr Steve Kons
MAYOR

KENTISH COUNCIL

Promoting

Tasmania's Outdoor Art Gallery

From the Office of Mayor Tim Wilson

19 July 2022

To Whom it may concern

Kentish Council has been briefed on the Whaleback Ridge Energy Park project by West Coast Renewable Energy Pty Ltd (WRE) and has followed its development with great interest. Not only is it aligned with Council's view that we must all contribute to tackling climate change, but the sector provides great opportunity for jobs of the future in our region.

This project is a 'game changer' for the region. It will have a direct benefit in our region's economic and social future. For example

- the strong intent to deliver local jobs and maximise the input of the business community in our region.
- the west and northwest regions need greater economic diversity and this project orientates our region towards the future with a forward looking industry
- our region is home to tremendous sources of renewable energy which also includes Hydro; we as a Council are keen to see a growth in the Wind Farm sector.

The Council is very aware of the divergent views that wind farms create. The proponents are acutely aware of this also and Council notes the significant environment related data they have obtained. Council agrees this is an important basis to then broaden the engagement with the wider community and look forward to working with WRE as they progress.

WRE is a great example of the bold and positive thinking needed to realise this potential. It is also great to see a Tasmanian company taking on the challenge. As such, Kentish Council is supportive of the project and we look forward to realising it's potential.

Yours sincerely

Tim Wilson
MAYOR

69 High Street Sheffield TAS | PO Box 63 Sheffield TAS 7306
council@kentish.tas.gov.au | www.kentish.tas.gov.au
t: 03 64910200 | f: 03 64911659
www.facebook.com/kentishcouncil

21 July 2022

To Whom it May Concern,

LETTER OF SUPPORT — WEST COAST RENEWABLE ENERGY

The West Coast Council has been briefed on the Whaleback Ridge Energy Park and is now as it has been previously, highly supportive. It is strongly aligned with our desire to diversify our economy and leverage major projects for community benefit.

The project will if properly managed, create a step change in our local community both economically and socially, by driving population growth and development of new housing. While there are issues to be addressed with how major projects support the community over the long term, we believe the proponents will be supportive of solutions to these problems.

The West Coast is the centre of Tasmania's renewable energy production and can lead Tasmania with its aims around a green energy future. This project is an important part of that.

We look forward to engaging with the State Government and West Coast Renewable Energy to see this project delivered and that it provides maximum benefit to the people of the West Coast

Yours Sincerely

Shane Pitt

MAYOR

Enquiries to: Executive Officer
P: (03) 6471 4700
E: ea@westcoast.tas.gov.au

PO Box 63 Queenstown TAS 7467
11 Sticht Street Queenstown TAS 7467

CIRCULAR HEAD COUNCIL

18th July 2022

Premier Jeremy Rockliff
43 Best Street
Devonport, Tasmania 7310
Emailed to: Jeremy.Rockliff@dpac.tas.gov.au
CC'd to: craig.brakey@westcoastrenew.com.au

Dear Premier,

WHALEBACK RIDGE ENERGY PARK

Circular Head Council is pleased to provide in principle support for the Whaleback Ridge Energy Park concept being proposed by Craig Brakey of West Coast Renew.

We are committed to doing our part to tackle climate change at a local level and as an area of Tasmania that is seeing increased investment in renewable energy production, we are highly interested in securing the local employment opportunities that these projects can bring when appropriately trained and skilled staff are available. This could contribute a significant positive benefit to our region's economic and social conditions.

Similarly, we know from the construction of the Granville Harbour Wind Farm that the indirect benefit to the local community is substantial.

The west and northwest regions need greater economic diversity, and this project could prove foundational as we look to the future.

We have local infrastructure and services that can support the project, and which will benefit greatly from this opportunity.

Council is very aware of public sentiment around renewable project proposals. The proponents are acutely aware of this as well and we note the significant environmental data they have obtained. This is an important basis for broader engagement with the wider community.

It is great to see a Tasmanian company stepping up to the challenge of providing skills that are fit for the future.

We believe this project is a game changer for the region and we urge you to give it serious consideration.

Yours sincerely

Daryl Quilliam
MAYOR DHQuilliam

CIRCULAR HEAD COUNCIL
ABN: 43 826 151 424
33 Goldie St (PO Box 348)
SMITHTON TAS 7330

03 6452 4800
council@circularhead.tas.gov.au
www.circularhead.tas.gov.au

Spero Mining Pty Ltd

05/01/2023

44 Andrew Street
Strahan, Tas 7468

Dear Craig,

I write to confirm that Spero Mining Pty Ltd is supportive of efforts to create a renewable energy industry on the west coast.

The growth of the renewables energy industry nationally and internationally presents a significant commercial necessity and opportunity for the mining sector to both play its part in decarbonising mining operations, as well as supplying a range of metals critical to the expansion of wind and solar projects.

Here in Tasmania, and particularly on the west coast, I believe there is a bright future for both industries. Spero Mining are interested in opportunities to work with proponents such as Westcoast Renewable Energy, to explore areas of co-operation that can benefit both parties.

It's a great opportunity and I look forward to developing our relationship.

Sincerely

Steve McDermott

Managing Director

Spero Mining Pty Ltd

ANDREW STREET, STRAHAN, TAS 7468
T 0459717033

BLUESTONE
MINES TASMANIA
JOINT VENTURE PTY LTD

West Coast Renewable Energy Pty Ltd.
Po Box 10
Zeehan
TAS 7469

Dear Alan,

I write to confirm that Bluestone Mines Tasmania Joint Venture Pty Ltd is supportive of efforts to create a renewable energy industry on the west and northwest coast of Tasmania.

The growth of the renewables energy industry regionally presents a significant and alternative opportunity for the mining sector to transition to a low carbon operation, and therefore remain compliant and internationally competitive in supplying world class materials. Additionally, responsible regionally based projects, helps develop, maintain, and sustain the communities based in the west and northwest and should be encouraged.

Bluestone believes, there is a mutually beneficial future for both the mining and renewables industries and are interested in opportunities to work with proponents such as Westcoast Renewable Energy, to explore areas of co-operation that can be of mutual benefit.

Regards,

Mark Recklies
Chief Operating Officer
Bluestone Mines Tasmania Joint Venture

Murchison Highway, Zeehan Tasmania 7469
• PO Box 20, Zeehan Tasmania 7469
• Telephone: +61 3 6473 2732 • Facsimile: +61 3 6473 1816

CRADLE COAST AUTHORITY

Stronger Councils, Stronger Region

18 July 2022

Craig Brakey

Strategic Advisor

West Coast Renewable Energy Pty Ltd

PO Box 10

Zeehan TAS 7469

Dear Craig

In-principle support for Whaleback Ridge Energy Park

The Regional Economic Development Steering Group (REDSG) has undertaken a preliminary assessment through the Regional Investment Framework of the Whaleback Ridge Energy Park proposal from WRE and on the evidence provided REDSG believe that it has the potential to be a project of regional significance. CCA is happy to provide in-principle support for the project.

This project supports the drive for greater economic diversity, increased innovation and a focus on the future across the west and northwest of Tasmania, with strong alignment between this proposal and the Regional Futures Plan. There is potential for the project to have a direct and substantial benefit on our region's economic and social outcomes by providing local jobs for the future, improved business opportunities for the community and the region.

The Cradle Coast Authority's work on 'Regional Futures Plan' emphasized the importance to community of *liveability*; current residents, and future residents, want to be part of a community that can support sustainable diverse economic growth and development, attract investment, and improved local services. In recent times managing climate change and its impact on the region has become high on the agenda. As a renewal energy project, Whaleback Ridge Energy Park has the potential to address this agenda.

REDSG assesses all projects for economic, social and environmental impact and understand that the project proponents, WRE are able to provide significant data that is critical to all future conversations and community engagement. We look forward to further exploring the potential of this project when you make your next presentation to the REDSG.

Yours sincerely

Sheree Vertigan AM

Chief Executive Officer

CRADLE COAST AUTHORITY ABN 55 279 164 790
1 - 3 Spring Street | PO Box 338, Burnie Tasmania 7320
(03) 6433 8400 | admin@cradlecoast.com | www. cradlecoast.com

CopperCorp Resources Inc.
Stephen Swatton
CEO, President & Director
55 Water Street, Unit 203
Vancouver, BC V6B 1A1
Canada
(**E**) stephen@coppercorpinc.com
(p) 604-970-8032

Date: August 3rd, 2022

Alan Bradford
West Coast Renewable Energy Pty Ltd.
Po BOX 10, Zeehan TAS 7469
Australia

Dear Mr. Bradford:

RE: Proposed Whaleback Ridge Energy Park Project

I write to confirm that CopperCorp Resources Inc. and its Australian/Tasmanian subsidiary, Georgina Resources Pty Ltd are supportive of efforts to expand the renewable energy capacity on the west coast of Tasmania.

CopperCorp, through Georgina, is a mineral exploration company on the west coast of Tasmania with 1400km^2 of prospective ground. CopperCorp and other mineral exploration companies in the west will rely on sourcing renewable energy from infrastructure such as the proposed Whaleback Ridge Energy Park Project to bring potential mineral deposits into production.

Tasmania has a unique competitive advantage when it comes to green energy and CopperCorp believes that developing renewable energy infrastructure is indispensable for increasing economic opportunities for Tasmanians and companies that operate within the state. More specifically, the growth of the renewable energy in Tasmania presents a significant opportunity for the mining sector to achieve net-zero carbon emissions and support mine development and constructions activities.

I believe the confluence of the renewable energy and mining sectors present an opportunity for Tasmania to become a leader in producing green energy metals the world desires. CopperCorp is interested in opportunities to collaborate with proponents such as Westcoast Renewable Energy to explore areas of co-operation that can benefit all stakeholders.

I look forward to developing our relationship to explore this significant opportunity.

Sincerely,

Stephen Swatton, CEO, President & Director of CopperCorp Resources Inc.

(signed) Stephen Swatton

Lighthouse Industries Holdings Pty Ltd
Suite 1002, 147 Pirie Street
Adelaide, SA, 5000
lhindustries.com.au

29 September 2023
Private & Confidential

Attn: Alex Simpson – Executive Chairman
Westcoat Renewable Energy Pty Ltd

Via email: alex.simpson@westcoastrenew.com.au, chantel.hodgson@westcoastrenew.com.au

To Whom It May Concern,

Support for the Whaleback Ridge Windfarm Project & Partnership Intent

I write on behalf of Lighthouse, one of Australia's leading integrated renewable energy infrastructure investors and developers. We wish to formally express our strong intention and commitment subject to mutual commercial agreement and necessary respective shareholder approvals, to partner with West Coast Renewable Energy in the development of the Whaleback Ridge Windfarm Project, specifically in the provision of services under a build own operate model for the balance of plant assets associated with the project with an estimated capital value in the order of AUD $600m.

Infrastructure Expertise

Solas Infrastructure, a division of Lighthouse, is led by CEO Richard Lowe. Richard is the immediate past CEO of Lumea. Under Richard's leadership Lumea designed and built under an asset owner model a market leading 10.5GW of network connection balance of plant and transmission assets - supporting new renewable generation assets across Australia. This pedigree allows Richard and his team a unique and privileged position to provide valuable support and insights into the planning, design implementation and operations to the Whaleback Ridge project.

Scaling Australian Sovereign Advanced Manufacturing

Lighthouse Industries is a division of Lighthouse led by group Chief Operating Officer Richard Phillips. Richard is the immediate past VP of Manufacturing Engineering at General Motors (Detroit, USA), overseeing the groups manufacturing operations and asset management globally, investing ~US$10b of capital annually in the groups automation and manufacturing assets.

Having relocated back to Australia, Richard is leading Lighthouse's acquisition, consociation and scaling up of Australian sovereign manufacturing capability to accelerate the country's transition to renewable energy. In addition lighthouse is evaluating the establishment of multiple large format greenfield manufacturing facilities of key component inputs to support the energy transition – components which have the potential to be utilised in the Whaleback Ridge project, but are constrained in global supply chains as a result of unprecedented global demand driven by the energy transition taking place globally. Due to the Whaleback project's scale and parallel global demand growth It is our firm belief that the proposed project partnership has the potential to underwrite significant new manufacturing investment in Tasmania to support the accelerated delivery of the project.

Supporting Tasmania's Renewable Energy Target

We are pleased also to support the project in progressing the State's Renewable Energy Target of 200% renewables by 2040. Lighthouse has several proud Tasmanian links, myself as founder and leader of the business having grown up and completed my schooling in Launceston to two Tasmanian parents, and more recently being

Lighthouse Industries Holdings Pty Ltd
Suite 1002, 147 Pirie Street
Adelaide, SA, 5000
lhindustries.com.au

fortunate to count the proudly Tasmanian Elphinstone Group as an investor in the Lighthouse business.

Should it be of interest, we would look forward to the opportunity to discuss the significant contribution we believe we can make to helping deliver this transformational project for Tasmania on an accelerated timeline.

Lighthouse has the ability and intent to allocate capacity and resources to mobilise and deliver our focus elements of the project in support of the potential alignment of the first phase (288MW) of generation from Whaleback with the Marinus Link project coming into commissioning on a target 2028 timeline.

We are as an organisation genuinely excited to support this visionary project for Tasmania. We are available for further discussion on the topic at your convenience.

Best regards,

Steven Butler
Chief Executive Officer
Lighthouse

Brookfield

12 September 2023

Office of the Hon Jeremy Rockliff MP
Premier of Tasmania
Level 11, 15 Murray Street
Hobart, TAS 7000

Dear Premier,

Subject: Letter of Support for West Coast Renewable Energy's Whaleback Ridge Project

I write on behalf of Brookfield Asset Management Ltd ('Brookfield') to express our support for West Coast Renewable Energy Pty Ltd ('WRE') and the Whaleback Ridge Wind Farm Project ('Whaleback Ridge').

Background

Recently, as guests of WRE, our senior Australian Renewable Power and Transition leadership team visited and evaluated the proposed Whaleback Ridge Project site along with other WRE projects in Tasmania. We believe this project possesses the potential to be a world-class renewable energy asset that would have a transformative effect on regional economic growth and employment in Tasmania.

As a global investor in renewables projects and other associated infrastructure, we recognise the significance of Whaleback Ridge and wish to express a strong interest in and willingness to provide financial support to develop the project. Our support is subject to further discussion and negotiation between Brookfield and WRE, Brookfield's investment approval processes and any customary external approvals. Further information on Brookfield's credentials are provided in Appendix A.

Battery of the Nation

We see Whaleback Ridge as an important project for Australia's energy transition. It has the potential to be a critical part of Tasmania's battery of the nation as well as serve electricity customers in other parts of the National Electricity Market ('NEM'). As part of Brookfield's proposed acquisition of Origin Energy Markets[1] we plan to develop up to ~14GW of new renewable and storage capacity over the coming decade. As part of executing this business plan, we see the potential of including a project like Whaleback Ridge in our 'green build out plan' assuming Marinus Link is completed and can deliver energy at scale to the Victorian market while also servicing local, Tasmanian demand as required.

WRE's prior success with the Granville Harbour Wind Farm is a testament to its capability and commitment to advancing the State's renewable energy portfolio. This proven pedigree, in a unique and challenging environment, provides us with a point of reference in the WRE team's ability to deliver this project.

The significant capital investment over the proposed Whaleback Ridge project's 30-year design life, coupled with the potential to create over 2,400 full-time equivalent positions in both construction and operational phases, would make a significant contribution to the West Coast of Tasmania's economy.

---

[1] On 27 March 2023, Brookfield and EIG signed a binding agreement to acquire Origin Energy. Brookfield and its institutional partners and investors, GIC and Temasek will acquire Origin's Energy Markets business. As at the date of this letter, the proposed transaction is subject to regulatory approvals, notably sign off by the Australian Competition and Consumer Commission ('ACCC') and the Foreign Investment Review Board ('FIRB')

Brookfield

Importantly, we note the project aligns with the Tasmanian Government's Renewable Energy Target of 200% by 2040, which would provide a range of public benefits including assisting Australia to meet its international commitments to address climate change.

As a leading global investor, Brookfield is proud to express its keen interest and readiness to support renewable energy investment in Tasmania including the Whaleback Ridge Renewable Energy Project, and we are aligned with WRE's vision for Tasmania's clean energy future.

Regards,

Luke Edwards

Managing Director, Head of Australia Renewable Power & Transition

Brookfield Asset Management

Brookfield

About Brookfield Asset Management and Brookfield Renewable

Brookfield is a leading global alternative asset manager with approximately US$850 billion of Assets Under Management ('AUM') [2] across renewable power, infrastructure, real estate, private equity and credit in North and South America, Europe, and Australasia. Building on a history as an owner and operator that dates back more than 100 years, Brookfield invests in long-life assets and businesses that help support the backbone of today's global economy. Throughout our operations, which supports approximately 200,000 operating employees in over 30 countries, we are committed to practices that have a positive impact on the communities in which we operate. Brookfield uses its global reach, access to large-scale capital and operational expertise to differentiate itself as an owner, investor, operator and developer of real assets globally. Brookfield is listed on the New York Stock Exchange (NYSE:BAM), the Toronto Stock Exchange (TSX:BAM.A). More information about Brookfield is available at www.brookfield.com.

Brookfield Renewable Partners ('BEP') is the renewable power and energy transition arm of Brookfield Asset Management. BEP operates one of the world's largest renewable power and energy transition platforms, with approximately US$79 billion of AUM[2] and approximately 3,700 operating employees. In 2023, BEP is on track to commission 5 GW of new renewable capacity. BEP is a global leader in decarbonisation having established leading platforms around the world across five continents with a multi-technology portfolio consisting of approximately 32 GW of installed capacity and 132 GW of development pipeline that include wind, solar, energy storage (including both pumped hydro and batteries), distributed generation and other transition asset classes. In each market in which we operate, we have strong operating businesses with full development, construction and operational capabilities. We leverage our extensive operating experience to maintain and enhance the value of assets, grow and de-risk cash flows and cultivate positive relations with local stakeholders. With an equity market capitalisation of approximately US$20 billion[2], BEP is one of the largest publicly-traded, pure-play renewable power and energy transition platforms globally.

About Westcoast Renewable Energy

WRE is a Tasmanian focused renewable energy development company, with a world class multi-gigawatt pipeline of onshore wind based energy projects.

The WRE team has a proven pedigree in the development of institutional scale infrastructure. Our principals have successfully developed, acquired and exited over AUD$1b of Australian multi-sector infrastructure assets including the 112MW Granville Harbour wind farm in Tasmania and Stilmark Holdings – now Australia's largest independent national telecommunications infrastructure development business (2022 rebranded to 'WaveConn').

[2] As at 30 June 2023

Appendix B Whaleback Ridge Renewable Energy Project Desktop Flora and Fauna Assessment

Whaleback Ridge Renewable Energy Project

Desktop Flora and Fauna Assessment

Prepared for
Westcoast Renewable Energy Pty Ltd

August 2023
Report No. 20209.05 (1.4)

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1. Executive summary

Nature Advisory Pty Ltd undertook a desktop flora and fauna assessment for the proposed Whaleback Ridge Renewable Energy Project. This assessment involves overall flora and fauna desktop studies and where relevant reference to the results of bird and bat surveys completed for the project detailed in separate reports including reference to: *Bird and Bat Assessments 2021-2022 by Nature Advisory Pty Ltd,* and *Preliminary Searches for Eagle Nests 2022 by Nick Mooney.*

The study area for the project comprises around 40,500 hectare of land between Zeehan and Granville Harbour. The construction of a wind farm, comprising up to 500 wind turbine generators and associated infrastructure, is proposed for the study area.

This investigation was commissioned to provide information on the potential extent and condition of native vegetation, fauna habitat and the likelihood of occurrence of listed flora and fauna species listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), the state *Threatened Species Protection Act 1995* (TSP Act) and threatened native vegetation communities under the *Nature Conservation Act 2002 (NCA)*.

Vegetation in the study area consists mostly of Buttongrass moorland with areas of heathy vegetation and *Eucalyptus nitida* forest within the gullies, interspersing the higher plateaus of Buttongrass moorland. Lake Pieman (a hydro electric water storage dam) occurs in the centre of the study area and larger woodland areas are located adjacent to the north and east. The coastal area provides shrubby coastal heath and sand dune vegetation.

The Whaleback Ridge Renewable Energy Project study area has been selected by the proponent for a number of reasons including the anticipated low abundance of threatened species susceptible to impact from wind farm developments. Site selection was informed by review of natural values records in the Natural Values Atlas, previous studies of the adjacent Granville Harbour Wind Farm, Heemskirk Wind Farm and a general understanding that the main soil and vegetation types in the turbine development area were not very likely to provide high quality habitat for threatened, diverse or abundant bird life or threatened species. As part of the site selection the proponent has also nominated turbine exclusion zones within the study area to avoid potential impact to areas which have higher likelihood of occurrence of threatened species as much as possible.

Five listed **flora species** are likely to occur or have the potential to occur within the turbine development area of the Moorland Buttongrass or Heathland:

- Smooth Heath (EPBC Act: Endangered; TSP Act: Endangered)
- Northwest Heath (TSP Act: Rare)
- Leafless Milkwort (TSP Act: Rare)
- Western Tridentbush (TSP Act: Rare)
- Horned Orchid (TSP Act: Rare)

Pre-clearance surveys and effective design, including micro-siting of turbines and disturbance footprint minimisation, will be used to mitigate potential any impacts.

Eight listed flora species have the potential to occur within turbine exclusion zones, such as Forest, Woodland, Rivers, Creeks and Coastal Areas:

- Scrambling Groundfern (EPBC Act: Endangered);

- Australian Trefoil (TSP Act: Rare);
- Golden Pomaderris (TSP Act: Rare);
- Harsh Ground-fern x Ruddy Ground-fern hybrid (TSP Act: hybrid or intergrade of a threatened species (unofficial));
- Narrowleaf Geebung (TSP Act: Rare);
- Pieman Eyebright (TSP Act: Endangered);
- Small Bentgrass (TSP Act: Rare); and
- Southern Swamp Wallaby-grass (TSP Act: Rare).

Coastal areas, gullies and wooded areas will be mostly avoided, except for associated infrastructure where unavoidable.

The following EPBC Act and Nature Conservation Act (NCA) listed **ecological communities** have the potential to occur:

- Tasmanian White Gum (*Eucalyptus viminalis*) Wet Forest (EPBC Act: Critically Endangered; NC Act: Listed)
- Tasmanian Forests and Woodlands dominated by black gum or Brookers gum (*Eucalyptus ovata/ E. brookeriana*) (EPBC Act: Critically Endangered; NC Act: Listed)

These communities would only occur within the gullies and targeted surveys would be required should any construction be proposed within these areas.

Fauna habitat in the study area consists largely of buttongrass plains. Gullies interspersing the buttongrass plains consists of forested habitat in the form of temperate rainforest, wet sclerophyll forest and woodland, dry sclerophyll forest and woodland. Aquatic habitat also exists in the form of creeks, rivers and Lake Pieman in the centre of the study area.

Four listed bird species have the potential to occur within the turbine development area:

Bird species

- Blue-winged Parrot (EPBC: Vulnerable)
- Fork-tailed Swift (EPBC: Migratory);
- Tasmanian Wedge-tailed Eagle (EPBC: Endangered; TSP: Endangered);
- White-throated Needletail (EPBC: Vulnerable and Migratory);
- White-bellied Sea-eagle (TSP: Vulnerable)

Six listed bird species, two mammal species, one fish and two snail species have the potential to occur within the turbine exclusion zones:

Bird species

- Azure Kingfisher (Tasmania) (EPBC: Endangered; TSP: Endangered);
- Latham's Snipe (EPBC: Migratory);
- Orange-bellied Parrot (EPBC: Critically Endangered; TSP: Endangered);
- Satin Flycatcher (EPBC: Migratory);
- Masked Owl (Tasmanian) (EPBC: Vulnerable);

- Grey Goshawk (TSP: Endangered);

Mammals

- Spot-tailed Quoll (Tasmanian population) (EPBC: Vulnerable; TSP: Rare);
- Tasmanian Devil (EPBC: Endangered; TSP: Endangered);

Fish and Invertebrates

- Australian Grayling (EPBC: Vulnerable; TSP: Vulnerable);
- Heazlewood River Hydrobiid Snail (TSP: Rare); and
- Little Henty River Hydrobiid Snail (TSP: Rare).

2. Introduction

West Coast Renewable Energy Pty Ltd engaged Nature Advisory Pty Ltd to conduct a desktop flora and fauna assessment for the proposed Whaleback Ridge Renewable Energy Project. The study area comprises 40,500 hectare of land between Zeehan and Granville Harbour. The construction of a wind farm with up to 500 turbine generators and associated infrastructure is proposed for the study area.

This report screens the site for flora and fauna species and ecological communities listed under the EPBC Act, TSP Act and NCA and discusses the implications of this for project planning and assessment. The assessment was based on a desktop evaluation of available information on the flora, fauna habitat and ecological communities of the study area and its surrounds supported by knowledge of the site obtained during site visits to scope the natural values studies (aerial and ground truthing across multiple points within the study area) and also the extensive bird and bat surveys undertaken in 2021 and 2022.

This report is the overall screening report for all listed flora and fauna species. Additional detailed reporting on avifauna has also been completed following detailed surveys as referenced from the following separate reports:

- Bird and Bat Assessments 2021-2022, Nature Advisory Group
- Preliminary Eagle Nest Search 2022, Nick Mooney

A review of existing information regarding the flora, fauna and native vegetation of the study area and surrounds was undertaken, including the following:

- Natural Values Atlas administered by the Department of Natural Resources and Environment Tasmania, search conducted on the 11th May 2023 with a 5km buffer applied;
- The Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) Protected Matters Search Tool, search conducted on the 11th May 2023 with a 5km buffer applied; and
- Previous studies conducted on adjacent and contiguous developments including natural values studies for Granville Harbour Wind Farm (adjacent to the project, studies completed in 2011-2012) and Heemskirk Wind Farm (within the project area, studies completed in 2001-2002)..

West Coast Renewable Energy Pty Ltd have undertaken a preliminary design of turbine exclusion zones (see Figure 1) based on the following criteria:

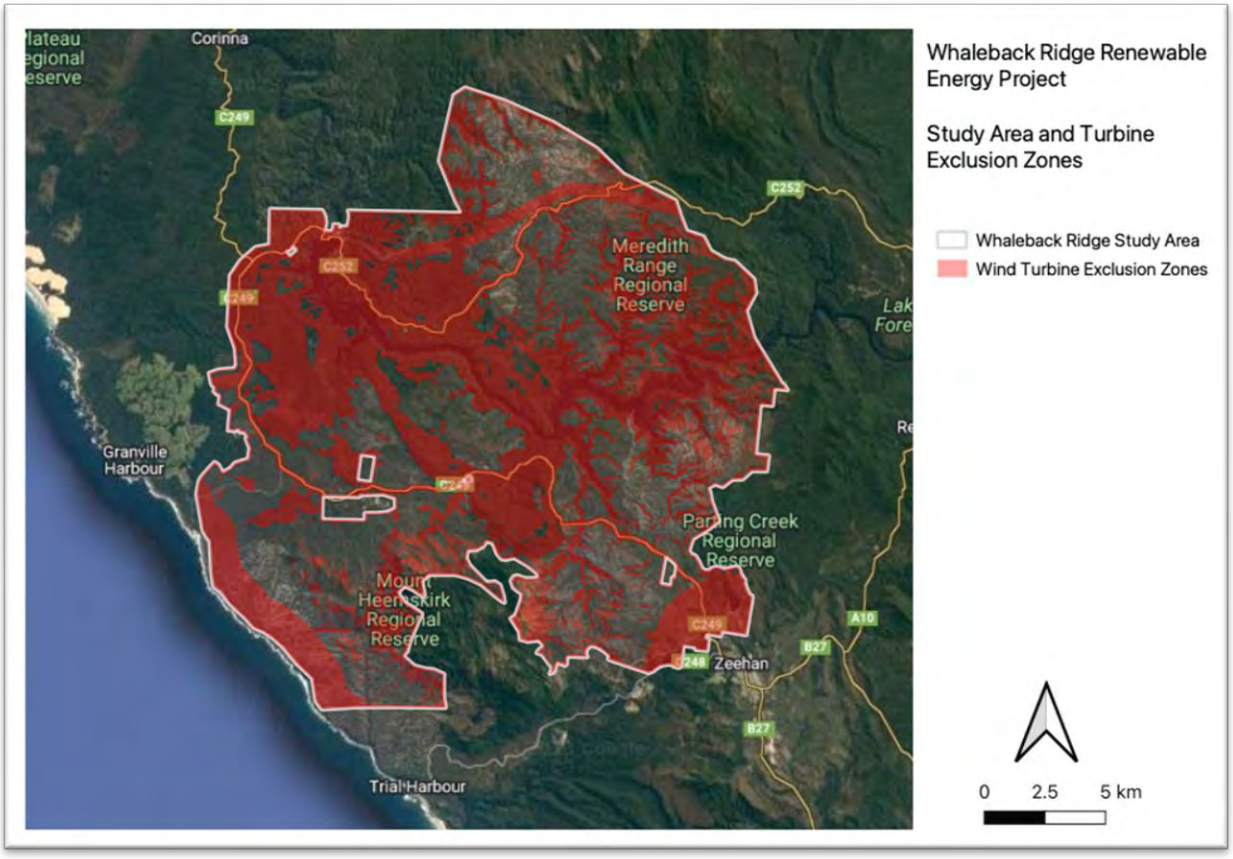
Criteria	Wind Turbine Exclusion Zone Criteria
Slope	Terrain steeper than 20° has been excluded from the development of turbines. It is likely turbines will be developed on areas of up to 15 degrees slope. Further engineering studies and ground truthing to be undertaken.
Coastal Exclusions for Orange Bellied Parrot Migration	Areas within 1500m of the coastline have been excluded from the turbine development area. Orange bellied parrots migrate along the West Coast of Tasmania. Refer to surveys undertaken by Nature

	Advisory in relation to targeted Orange Bellied Parrot surveys (Nature Advisory 2022).
Vegetation	All areas of forest have been excluded from the turbine development area. No clearing of trees is anticipated for turbine construction. Further flora studies will be undertaken to confirm desktop vegetation classifications and also understand and avoid threatened flora and habitat for threatened fauna where possible. Some clearing of forest vegetation will be required for ancillary infrastructure such as cables and roads. This will be minimised during the design and engineering stage with further surveys undertaken to avoid and minimise impact.
Sensitive Receptors	3000m turbine exclusions have been set for any dwellings at Trial Harbour and Zeehan. 1000m turbine exclusions have been set from shacks at Granville Harbour.
Hydrological	Turbine exclusions will be established around waterways to exclude turbines from at least 60m away from the banks of waterways. Further studies to confirm waterways and any potential creek crossings from ancillary infrastructure such as cables and roads will be undertaken.
Existing Roads	Turbine exclusion zones have been set at 110m away from Heemskirk and Pieman Road.
Existing Transmission	250m exclusion has been set from existing transmission.
Boundary	Areas within 100m of boundaries have been excluded from turbine development area.

The proposed turbine exclusion areas are desktop based on potential constraints that are likely to result in turbines being excluded from those areas. These may change based on ground-truthing and results of further studies. For example, further turbine exclusion zones will likely be established if surveys identify areas of significant habitat for threatened species such as eagle nests. The turbine exclusion areas will potentially include some of the ancillary infrastructure such as cables, roads and electrical infrastructure (see Figure 1).

This investigation was undertaken by a team from Nature Advisory comprising Carter Carvalho (Technical Officer), Arend Kwak (Botanist), Michael Sebastian (Zoologist), Curtis Doughty (Senior Zoologist) and Dr Inga Kulik (Senior Ecologist and Project Manager/Director).

Figure 1: Proposed Turbine Exclusion Zones



3. Existing information and methods

3.1. Existing information

Existing information used for this investigation is described below.

3.1.1. Existing reporting and documentation

The existing documentation below, relating to the study area was reviewed.

- *Heemskirk Wind Farm – Avifauna Monitoring Survey (Biosis Research Pty Ltd, 2002).*
- *Granville Harbour Wind Farm – Matters of National Environmental Significance (Brett Lane & Associates Pty Ltd, 2012)*
- *Whaleback Ridge Renewable Energy Project - Bird and Bat Assessments 2021-2022, Nature Advisory*
- *Whaleback Ridge Renewable Energy Project – Preliminary Eagle Nest Searches, 2022, Nick Mooney*

3.1.2. Native vegetation

Vegetation mapping administered by TASVEG was reviewed to determine the type of native vegetation likely to occur in the study area and surrounds.

Sources included the following:

- *Natural Values Atlas Report,* (Department of Natural Resources and Environment) generated 11th May 2023.
- *EPBC Act Protected Matters Report* (Department of Climate Change, Energy, the Environment and Water), generated 11th May 2023.

3.1.3. Listed matters

Existing flora and fauna species records and information regarding the potential occurrence of listed matters were obtained from an area termed the 'search region', defined here as an area with a radius of 10 kilometres from the edge of the Whaleback Ridge Renewable Energy project area.

A list of the flora and fauna species recorded in the search region was obtained from the *Natural Values Atlas,* a database administered by the Department of Natural Resources and Environment.

The online EPBC Act *Protected Matters Search Tool* (Department of Climate Change, Energy, the Environment and Water 2022a) was consulted to determine whether nationally listed species or communities potentially occurred in the search region based on habitat modelling.

3.2. Limitations of assessment

The content for this mostly desktop-based assessment is derived from online resources and observations made during bird and bat surveys undertaken in 2021 and 2022. Therefore, the presence of vegetation communities and the likelihood of occurrence for listed matters is largely based on modelled data. This provides a general overview of the study area, though it is not a substitute for on-ground field assessments. Detailed surveys will be required to determine the validity of this modelling and finer details within the landscape. TASVEG specifically states that it is indicative only, and cannot be used as a legal basis for vegetation assessments.

However, these limitations were not considered to compromise the validity of the current investigation that was designed to provide a broad overview of the study area and the potential for listed matters to occur.

4. Assessment results

4.1. Site description

The study area for this investigation (Figure 1) comprised a 40,500-hectare area between Zeehan and Granville Harbour. It is located within Mount Heemskirk Regional Reserve, Meredith Range Regional Reserve and heathland north and south of Pieman Lake. Trial Harbour is located to the south of the study area, on the coast, while the town of Zeehan occurs to the south-east. Mount Heemskirk, a granitic mountain some 700 metres above sea level, occurs to the south of the study area. The majority of the study area is located on the surrounding high ground with Lake Pieman, a man-made reservoir created by the damming of the Pieman River in the centre.

The study area supported a range of soil types, including organosol, rudosol, ferrosol and dermosol. Sea cliffs occur along the coast, and the landscape then rises to a plateau around Mount Heemskirk. This plateau is divided by gullies supporting treed vegetation. The land undergoes frequent burning both from natural causes (dry lightning strike) and hazard reduction burns.

Land uses include forestry, mining, hydro energy storage, high voltage transmission, small areas of agriculture and the Granville Harbour Wind Farm to the west.

Vegetation in the study area primarily consisted of Buttongrass moorland, with areas of heathy vegetation and Smithton Peppermint (*Eucalyptus nitida*) forest within adjacent gullies. These areas of heath and forest interspersed the higher plateaus of Buttongrass moorland. Lake Pieman in the centre of the site supports a greater diversity of vegetation communities, though Buttongrass moorland still remains a dominant feature in the landscape. The coastal area supports shrubby coastal heath and sand dune vegetation.

Treed fauna habitat, wet scrub and aquatic habitat are generally well-connected to each other and to extensive tracts of forested land and aquatic habitat outside the study area as they formed connected habitat corridors along gullies, creeks and rivers in the study area. Buttongrass plains comprised largely contiguous patches as the dominant vegetation type in the study area. Other fauna habitat types, such as heathland, sedgeland, rushland and rocky habitat were patchily distributed across the study area and mostly isolated from each other.

The study area lies within the Tasmanian West bioregion and largely falls within the Pieman catchment. Southern edges of the study area may fall into the King-Henty catchment.

4.2. Native Vegetation

The Natural Values Atlas (Department of Natural Resources and Environment Tasmania 2022) identifies that seven Vegetation Groups occur within the study area (Figure 2). These are:

- Moorland, sedgeland and rushland (most of the study area)
- Wet eucalypt forest and woodland (within gullies)
- Rainforest and related scrub (within gullies and lower lying areas)
- Scrub, heathland and coastal complexes (closer to the coast and in gullies)
- Dry eucalypt forest and woodland (smaller areas on ridges)
- Non eucalypt forest and woodland (one very small area in the northeast)
- Other natural environments (Lake Pieman)
- Modified land (dams, quarries, etc)

Modelled vegetation group Wet Eucalypt Forest and Woodland has the potential to support State Threatened community:

- Eucalyptus Ovata Forest and woodland.

Modelled vegetation group Scrub, Heathland and Coastal Complexes has the potential to support State threatened community:

- Banksia Marginata Wet Scrub.

The following State threatened community can occur at the fringe of saltmarsh, lagoons and rivers:

- Melaleuca Ericifolia Swamp Forest.

Photograph 1 shows large areas within the study area dominated by Buttongrass moorland with areas of heathy vegetation and Smithton Peppermint (Eucalyptus nitida) forest within gullies interspersing the moorland.

Photograph 1: Typical Buttongrass moorland habitat at the proposed Whaleback Ridge Renewable Energy Project

The Natural Values Atlas maps 38 modelled vegetation communities (TASVEG 4.0) within the study area (see Figure 3) with the following most common types:

- Buttongras Moorland (MB, different subtypes)
- Eucalyptus obliqua forest over rainforest (WOR)
- Eucalyptus obliqua wet forest (undifferentiated) (WOU)
- Eucalyptus nitida forest over rainforest (WNR)
- Nothofagus - Phyllocladus short rainforest (RMS)
- Leptospermum with rainforest scrub (SRF)
- Western wet scrub (SWW)
- Melaleuca squarrosa scrub (SMR)

Figure **2**: Vegetation groups
TASVEG 4.0

Project: Whaleback Ridge Wind Farm
Client: West Coast Renwable Pty Ltd
Date: 8/11/2022

Wind farm study boundary

Vegetation Group

- Dry eucalypt forest and woodland
- Highland and treeless vegetation
- Modified land
- Moorland, sedgeland and rushland
- Native grassland
- Non eucalypt forest and woodland
- Other natural environments
- Rainforest and related scrub
- Saltmarsh and wetland
- Scrub, heathland and coastal complexes
- Wet eucalypt forest and woodland

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Figure **3**: Modeled vegetation communities - TASVEG4.0

Project: Whaleback Ridge Wind Farm

Client: West Coast Renewable Pty Ltd

Date: 8/11/2022

Wind farm boundary

Vegetation community

- (DNI) Eucalyptus nitida dry forest and woodland
- (DOB) Eucalyptus obliqua dry forest
- (DOV) Eucalyptus ovata forest and woodland
- (FPE) Permanent easements
- (FPF) Pteridium esculentum fernland
- (FUM) Extra-urban miscellaneous
- (MBP) Pure buttongrass moorland
- (MBR) Sparse buttongrass moorland on slopes
- (MBS) Buttongrass moorland with emergent shrubs
- (MBU) Buttongrass moorland (undifferentiated)
- (MBW) Western buttongrass moorland
- (MRR) Restionaceae rushland
- (MSW) Western lowland sedgeland
- (NAD) Acacia dealbata forest
- (NAR) Acacia melanoxylon forest on rises
- (NLA) Leptospermum scoparium - Acacia mucronata forest
- (NLE) Leptospermum forest
- (NME) Melaleuca ericifolia swamp forest
- (OAQ) Water, sea
- (ORO) Lichen lithosere
- (RHP) Lagarostrobos franklinii rainforest and scrub
- (RML) Nothofagus - Leptospermum short rainforest
- (RMS) Nothofagus - Phyllocladus short rainforest
- (RMT) Nothofagus - Atherosperma rainforest
- (SBR) Broad-leaf scrub
- (SCH) Coastal heathland
- (SLL) Leptospermum lanigerum scrub
- (SMR) Melaleuca squarrosa scrub
- (SRF) Leptospermum with rainforest scrub
- (SSC) Coastal scrub
- (SWR) Western regrowth complex
- (SWW) Western wet scrub
- (WNL) Eucalyptus nitida forest over Leptospermum
- (WNR) Eucalyptus nitida forest over rainforest
- (WNU) Eucalyptus nitida wet forest (undifferentiated)
- (WOL) Eucalyptus obliqua forest over Leptospermum
- (WOR) Eucalyptus obliqua forest over rainforest
- (WOU) Eucalyptus obliqua wet forest (undifferentiated)

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4.3. Listed ecological communities

The EPBC Protected Matters Search Tool (Department of Climate Change, Energy, the Environment and Water 2022a) indicated that four ecological communities listed under the EPBC Act had the potential to occur in the search region (Table 1). Occurrence of these communities in the study area was determined based on a desktop assessment of the native vegetation present against published descriptions and condition thresholds for these communities.

Table 1: EPBC Act-listed ecological communities and likelihood of occurrence in the study area

Ecological Community	EPBC Status	Occurrence in the study area
Alpine Sphagnum Bogs and Associated Fens	Endangered	Associated TASVEG communities are not modelled to occur within the study area. Primarily occurs within the Tasmanian Central Highlands and Tasmanian Southern Ranges IBRA bioregions. **Unlikely to occur.**
Tasmanian White Gum (*Eucalyptus viminalis*) Wet Forest	Critically Endangered	Tasmanian White Gum is not a characteristic canopy species of the TASVEG classifications associated with the study area. Associated TASVEG communities are not modelled to occur within the study area. The occurrence of this community is also very limited on the west coast of Tasmania. However, the presence or absence of the associated communities cannot be confirmed without a detailed assessment. Suitable habitat may exist in gullies. **Potential to occur.**
Giant Kelp Marine Forests of South East Australia	Endangered	Study area does not support marine habitat. **Does not occur**
Tasmanian Forests and Woodlands dominated by black gum or Brookers gum (*Eucalyptus ovata / E. brookeriana*)	Critically Endangered	Black Gum and Brookers Gum are not characteristic canopy species of the TASVEG communities modelled to occur within the study area. Associated TASVEG communities are not modelled to occur within the study area. However, the presence or absence of the associated communities cannot be confirmed without a detailed assessment. Suitable habitat may exist in gullies. **Potential to occur.**

Notes: EPBC status = status under the EPBC Act.

The Natural Values Atlas Report, (Department of Natural Resources and Environment 2022) indicated that three ecological communities listed under the NV Act had the potential to occur in the search region:

- Eucalyptus ovata forest and woodland
- Melaleuca ericifolia swamp forest
- Banksia Marginata Wet Scrub

These listed communities would only have potential to occur within forested gullies or scrub, heathland and coastal areas outside the turbine development area.

4.4. Listed flora species

Records from the Natural Values Atlas (Department of Natural Resources and Environment 2022) and Commonwealth EPBC Protected Matters Search Tool (Department of Climate Change, Energy,

the Environment and Water 2022a) indicated that within the search region there were records of, or potential suitable habitat occurred for, five species listed under the Commonwealth EPBC Act and 16 listed under the state TSP Act, including one listed under both Acts.

The likelihood of occurrence of species listed under the EPBC Act and TSP Act in the study area is addressed in Table 2. Species considered 'likely to occur' have very high potential of occurring in the study area based on numerous records in the search region and suitable habitat in the study area. Species considered to have the 'potential to occur' are those for which suitable habitat exists or may exist, but recent records are scarce.

Species with potential to occur within turbine development area

This analysis indicates that five listed flora species are likely to occur or have the potential to occur within the turbine development area of the Moorland Buttongrass or Heathland:

- Smooth Heath (EPBC Act: Endangered; TSP Act: Endangered)
- Northwest Heath (TSP Act: Rare)
- Leafless Milkwort (TSP Act: Rare)
- Western Tridentbush (TSP Act: Rare)
- Horned Orchid (TSP Act: Rare)

Pre-clearance surveys and effective design, including micro-siting of turbines and disturbance footprint minimisation, will be used to mitigate impacts.

Species with potential to occur within turbine exclusion zones

Seven listed flora species have the potential to occur within turbine exclusion zones, such as Forest, Woodland, Rivers, Creeks and Coastal Areas:

- Scrambling Groundfern (EPBC Act: Endangered) – within gullies;
- Australian Trefoil (TSP Act: Rare) – coastal areas;
- Golden Pomaderris (TSP Act: Rare) – within woodland;
- Harsh Ground-fern x Ruddy Ground-fern hybrid (TSP Act: hybrid or intergrade of a threatened species (unofficial)) – adjacent to rivers and creeks;
- Narrowleaf Geebung (TSP Act: Rare) – in rainforest and scrub;
- Pieman Eyebright (TSP Act: Endangered) – within gullies;
- Small Bentgrass (TSP Act: Rare) – within wooded gullies; and
- Southern Swamp Wallaby-grass (TSP Act: Rare) – adjacent to rivers and creeks.

Although the exact development footprint has yet to be finalised, all forested gully areas and a 1.5km buffer along the coast are proposed to be turbine exclusion zones. Some clearing in gullies will be required for cable and road crossings. There is potential for direct impact if species are found during pre-clearance surveys and if clearing is unavoidable. Potential impacts will be minimised through effective design, pre-clearance surveys and minimisation of the disturbance footprint.

Table 2: Listed flora species and their likelihood of occurrence in the study area

Common Name	Scientific name	TSP	EPBC -Thrt	Habitat	Date of last record	Likelihood of occurrence
Potential to occur within turbine development area (Buttongrass Moorland)						
Leafless Milkwort	*Comesperma defoliatum*	rare		The habitat of this species includes wet heathland/sedgeland, buttongrass moorland, coastal low scrub and on the crests of dunes. It has also been recorded from flat alkaline pans. The predominant substrates include peat, quartzite and sand (Department of Primary Industries, Parks, Water and Environment 2016).	10-Feb-16	Buttongrass Moorland habitat prevalent, records in the western part of the study area. **Likely to occur.**
Northwest Heath	*Epacris curtisiae*	rare		Occurs in peaty soils or undulating terrain in association with locally common heathlands, graminoid heaths and scrub in the northwest in altitudes below 300 m (DNRE 2022).	28-Sep-14	Heathland habitat present, and there are records from the north-east of the study area. **Likely to occur.**
Smooth Heath	*Epacris glabella*	endangered	Endangered	Restricted to shrubby heathland, scrubland and woodland on ultramafic (serpentinite) substrates in Tasmania's northwest, with an outlying location on non-ultramafic rocks along the Gordon River in the southwest. Its ultramafic habitat is restricted (DNRE 2022).	24-Oct-20	Suitable habitat may occur in heathland and woodland. There are no records of this species within the study area, but some recent records approximately 5-6 km to the east and north-east of the study area. **Potential to occur.**
Western Tridentbush	*Micrantheum serpentinum*	rare		Habitat includes open low eucalypt woodland, shrubland and heathland, generally on lateritic soils, in a region with mean annual rainfalls exceeding 2000 mm (DNRE 2022).	23-Mar-22	Eucalypt woodland, heathland and shrubland present. There are no records of this species within the study area, but some recent records approximately 5-6 km to the east and north-east of the study area. **Likely to occur.**
Horned Orchid	*Orthoceras strictum*	rare		Occurs in a wide range of habitat types including buttongrass moorland, sedgy and scrubby heathland, sedgy eucalypt shrubland and open forest, usually on poorly to moderately drained peaty, sandy and clay soils that are at least seasonally moist. It can also occur on thin mossy soils at soaks on and below rock faces. The species has a wide elevation range from sea level to 1000 m (on the mainland) but it generally occurs at lower elevations in coastal and near-coastal Tasmania (Department of Primary Industries, Parks, Water and Environment 2008).	14-Feb-21	Buttongrass Moorland habitat prevalent, 3 records exist of this species within the study area. A number of other records of this species exist within 5km to the south and south east of the study area. **Likely to occur.**
Potential to occur within turbine exclusion zones (Forest, Woodland, Rivers/Creeks and Coastal Areas)						
Pieman Eyebright	*Euphrasia amplidens*	endangered		Grows in openings amongst dense shrubby vegetation on ultramafic substrates. It appears to be restricted to a highly localised part of the catchment of the Pieman River in the central west of Tasmania (DNRE 2022).	17-Dec-21	There are no records of this species within the study area. There are some recent records of this species approximately 5-6 km to the north-east of the study area. Potential for suitable habitat within gullies, though the species is highly localised. **Potential to occur.**

Common Name	Scientific name	TSP	EPBC -Thrt	Habitat	Date of last record	Likelihood of occurrence
Harsh Ground-fern x Ruddy Ground-fern hybrid	*Hypolepis muelleri x rugosula*	hybrid or intergrade of a threatened species (unofficial)		Occurs along watercourses, swampy areas or deep, rich, alluvial soils below 120 m altitude in northern Tasmania including King and Flinders islands. It has also been recorded below a light canopy of Acacia melanoxylon (blackwood), Melaleuca or Eucalyptus species (DNRE 2022).	6-Jul-11	There are no records of this species within the study area. There are some records of this species within 1 km to the north-east and 3 km to the north-west within wet forest areas. Suitable habitat may occur in the study area adjacent to rivers and creeks. **Potential to occur.**
Southern Swamp Wallaby-grass	*Amphibromus neesii*	rare		Found in damp ground around marshes, lagoons, river flats, pools and streams (DNRE 2022).	2-Dec-81	There are no records of this species within the study area. There is one old record of this species 4 km to the south of the study area. Suitable habitat may occur in the study area adjacent to rivers and creeks. **Potential to occur.**
Small Bentgrass	*Deyeuxia minor*	rare		Inhabits open eucalypt forests or the margins of wet sclerophyll forest in the south-west, south and north-east of the State (DNRE 2022).	2-Dec-81	There are no records of this species within the study area. There is one old record of this species 4km to the south of the study area. Potential for suitable habitat within wooded gullies, but unlikely to be widespread. **Potential to occur.**
Australian Trefoil	*Lotus australis*	rare		Found in coastal areas around the State within *Poa* tussock grassland, low coastal shrubbery and dunes (DNRE 2022).	26-Nov-08	There are no records of this species within the study area. There are 2 records of this species 3 km to the west near Granville Harbour. Potential for suitable habitat in coastal areas. **Potential to occur.**
Narrowleaf Geebung	*Persoonia muelleri subsp. angustifolia*	rare		Occurs in central and western Tasmania in rainforest to dense scrub and perhaps, sub-alpine heath in a variety of sedimentary and metamorphic substrata. It typically occurs in the ecotone between dry scrub and rainforest, particularly where high light levels occur on the ground due to a shorter and more open scrub. It is found from 50 to 700 metres altitude (DNRE 2022).	12-Aug-83	There are no records of this species within the study area. There is one record of this species 7 km to the east of the study area. Potential for suitable habitat associated with rainforest and scrub communities. **Potential to occur.**
Golden Pomaderris	*Pomaderris intermedia*	rare		An uncommon shrub that grows in dry and wet sclerophyll forests (University of Tasmania 2019).	12-Jul-11	There are no records of this species within the study area. There is one record 3km to the east of the study area. Potential for suitable habitat within woodland. **Potential to occur.**
Scrambling Groundfern	*Hiya distans*		Endangered (listed as Hypolepis distans)	Recorded in Tasmania from Melaleuca squarrosa–Leptospermum scoparium– Acacia melanoxylon scrubland bordering Melaleuca ericifolia swamp forest, disturbance-induced Baloskion tetraphyllum sedgeland, as well as from disturbed areas in wet eucalypt or mixed forest co-dominated by Eucalyptus brookeriana and Acacia melanoxylon. Soils tend to be high in organic matter with moderate to poor drainage, while all sites are in areas of moderate rainfall below 40 m above sea level (Department of Primary Industries, Parks, Water and Environment 2006).	N/A	There are no records of this species in the study area and no records within 10km search region. Potential for suitable habitat within gullies. **Potential to occur.**
No suitable habitat / unlikely to occur						
Coast Speedwell	*Veronica novae-hollandiae*	vulnerable		The species has been recorded along the State's west and southwest coasts between the Italian River and Cockle Creek, where it grows in sandy littoral banks and herbfields (Department of Primary Industries and Water 2008).	25-Nov-45	There are no records of this species in the study area. There is one very old record of this species 3km to the south of the study area. No suitable habitat within the study area, except for sandy banks on the coast. **Unlikely to occur.**

Common Name	Scientific name	TSP	EPBC -Thrt	Habitat	Date of last record	Likelihood of occurrence
Dusky Scurf-pea	*Cullen microcephalum*	rare		Inhabits well-drained rocky areas and the salt spray zone 100 m from the coast around the west and the north-west (DNRE 2022).	12-Dec-96	No suitable habitat within the study area, and no recent records from the search region. **Unlikely to occur.**
Salt Club-sedge	*Bolboschoenus caldwellii*	rare		Widespread in shallow, standing, sometimes brackish water, rooted in heavy black mud (DNRE 2022).	3-Dec-81	Suitable wetland habitat unlikely to occur, no recent records from search region. **Unlikely to occur.**
Dune Buttercup	*Ranunculus acaulis*	rare		Grows on sand in seepage areas on the coastal dunes of the west and south coasts (University of Tasmania 2019).	26-Nov-08	No suitable habitat in study area. **Unlikely to occur.**
Windswept Spider Orchid	*Caladenia dienema*		Endangered	Known from eight populations, all coastal or very near coastal, ranging from West Point to Conical Rocks, on Tasmania's west coast. It grows in windswept low coastal or near-coastal heathland on moist to well-drained sandy and clay loams (DNRE 2023).	N/A	Rare species known from eight populations, no nearby records from the search region. Suitable habitat only very close to the coast. **Unlikely to occur.**
Grassland Paperdaisy	*Leucochrysum albicans subsp. tricolor*		Endangered	Occurs in the west and on the Central Plateau and the Midlands, mostly on basalt soils. This species would have originally occupied *Eucalyptus pauciflora* (cabbage gum) woodland and tussock grassland, though most of this habitat is now converted to improved pasture or cropland (DNRE 2022).	N/A	No suitable habitat present in the study area, no nearby records in the search region. **Unlikely to occur.**
Grassland Greenhood	*Pterostylis ziegeleri*		Vulnerable	Restricted to the east and north of Tasmania. In coastal areas, the species occurs on the slopes of low stabilised sand dunes and in grassy dune swales, while in the Midlands it grows in native grassland or grassy woodland on well-drained clay loams derived from basalt (DNRE 2022).	N/A	Study area occurs outside typical range, no nearby records in the search region. **Unlikely to occur.**
Slender Twigsedge	*Baumea gunnii*	rare		In Tasmania, Baumea gunnii inhabits wet moors, creeks and riverbanks throughout the State (Department of Sustainability, Environment, Water, Population and Communities 2011).	N/A	No records in the search region and habitat limited to creeks and riverbanks. **Unlikely to occur.**
Mountain Sedge	*Carex gunniana*	rare		In Tasmania, Carex gunniana grows in wet eucalypt forest and sandy heathlands, by the sides of streams, littoral sands and shingle with seepage (DNRE 2023).	N/A	No records in the search region and habitat limited to creeks and riverbanks. **Unlikely to occur.**
Small Bentgrass	*Deyeuxia minor*	rare		Deyeuxia minor inhabits open eucalypt forests or the margins of wet sclerophyll forest in the south-west, south and north-east of the State (DNRE 2023).	2-Dec-1981	One record within the search region, but distribution mostly in Southern and North-eastern part of Tasmania. **Unlikely to occur.**
Branching Rush	*Juncus prismatocarpus*	rare		Forests and trail sides on mountain slopes, wet grasslands in sparse forests, thickets, fields, marshy places, swampy river banks, streamsides, sink holes; near sea level to 3000 m (ALA 2023)	N/A	No records in the search region and not suitable habitat present. **Unlikely to occur.**
Dune Buttercup	*Ranunculus acaulis*	rare		Within Tasmania the species is restricted to the west and northwest coast, where it grows in seepage areas on the seaward sides of dunes (Menadue & Crowden 1989).	2-Dec-81	Occurs only in dunes of coastal areas. No suitable habitat. **Unlikely to occur.**

Notes: EPBC-Thrt = threatened species status under EPBC Act; **TSP** = threatened species status under the TSP Act.

4.5. Fauna habitat

The study area is currently known to support the following main fauna habitat types (Figure 4). However, this list is non-exhaustive as identifying and mapping habitat in the study area is beyond the scope of this desktop assessment and previous field assessments focussing on bird and bat surveys. Percentage covers for the habitat descriptions below are estimates.

- Buttongrass plains;
- Heathland;
- Temperate rainforest and related scrub;
- Wet eucalypt forest and woodland;
- Dry eucalypt forest and woodland;
- Wet scrub;
- Other scrub;
- Other sedgeland, rushland;
- Aquatic habitat;
- Potential rocky habitat; and
- Modified land.

Buttongrass plains: This habitat is the dominant vegetation type within the open parts of the study area (which constitute the majority of the site). These plains have been noted as being sedge-like and grow no higher than 30-50 cm high. Some rocks are present in parts of this habitat, although it is difficult to quantify how much and where in the landscape they occur. It would be reasonable to expect the patches are connected or contiguous. This habitat is currently estimated to occupy more than 60% of the study area. These areas are burnt frequently by fuel reduction burns and dry lightning.

Heathland: Based on TASVEG mapping, this habitat primarily occurs in the southwest part of the study area with the largest patch located on the coast, although there are several smaller patches located inland. This heathland has been noted as being shrubby but grows no higher than 30-50 cm high with some rocks present in parts of this habitat. This habitat is currently estimated to occupy less than 1% of the study area.

Temperate Rainforest and related scrub: This habitat was not observed in person during field surveys. However, based on TASVEG mapping, it occurs in large patches along gullies and in lower lying areas in the northwest within the study area within the study area. This habitat is currently estimated to occupy around 15% of the study area. Patches of this habitat largely appear connected to extensive tracts of forested habitat directly adjacent to the study area by corridors along gullies and creeks. The dominant tree species is likely to be Smithton Peppermint (*Eucalyptus nitida*). This habitat forms part of the turbine exclusion zones nominated for the project.

Wet Eucalypt Forest and Woodland: Based on TASVEG mapping, this habitat largely occurs in large patches along gullies. This habitat is currently estimated to occupy approximately 15% of the study area. The dominant tree species is not currently known for certain, as the habitat has not been systemically assessed in the field – however, it is likely to be Smithton Peppermint. This habitat forms part of the turbine exclusion zones nominated for the project.

Dry Eucalypt Forest and Woodland: This habitat largely occurred in patches on higher ground along gullies within the study area. It was noted to have a primarily heathy understory. Although the trees (largely

eucalypts) were relatively stunted and windswept, large old trees with hollows were present at low densities. Fallen timber and rocks were also present. This habitat is currently estimated to occupy less than 2% of the study area. This habitat forms part of the turbine exclusion zones nominated for the project.

Wet scrub: This habitat was not observed in person during field surveys. However, based on TASVEG mapping, it appears to be widespread but patchily distributed across the study area (although somewhat associated with gullies), with the largest patches occurring in the southwest parts of the study area. This habitat is currently estimated to occupy 2,997 ha, 7.9% of the study area. Their occurrence in gullies appears to help this habitat form corridors maintaining some connectivity between patches, although it is likely some patches are also relatively isolated. This habitat forms part of the turbine exclusion zones nominated for the project.

Other scrub: This habitat was not observed in person during field surveys. However, based on TASVEG mapping, it appears to be widespread but patchily distributed across the study area. This habitat is currently estimated to occupy less than 1.5% of the study area. Large clusters and patches of this habitat near the coast in the southwest of the study area and Lake Pieman in the centre of the study area appear to have some connectivity within themselves, but most patches of this habitat appear to be relatively isolated. This habitat forms part of the turbine exclusion zones nominated for the project.

Other sedgeland, rushland: This wetland habitat is patchily distributed in the central and western parts of the study area. Most patches of this habitat appear to be relatively isolated from other patches. This habitat is currently estimated to occupy less than 0.5% of the study area. This habitat forms part of the turbine exclusion zones nominated for the project.

Aquatic habitat: This habitat occurs in rivers and creeks within the study area, which are typically in gullies. This habitat occupies a relatively small proportion of the study area (around 5%) with a sizable patch occurring in the form of Lake Pieman in the centre of the study area. Some creeks and rivers in the study area are likely to be ephemeral and it is likely that aquatic habitats in the study area experience a high degree of connectivity when flowing as most of them drain into Lake Pieman. This habitat has been inferred from topographical mapping and has not been visually observed during field assessments as descending to likely locations of these habitats was found to be hazardous. Based on TASVEG mapping, it primarily occurs in the central and eastern parts of the study area. This habitat forms part of the turbine exclusion zones nominated for the project.

Potential rocky habitat: Some rocky habitat is known to occur within the study area but has not been systemically surveyed for, so any patterns of occurrence across the study area are not currently known for certain. It is likely to occur near the tops of steep slopes in the study area, and along ridge lines. TASVEG mapping indicates most patches of this habitat occur in the south and west of the study area. This habitat occupies a relatively small proportion of the study area (less than 0.2%), and it is likely to be patchy in occurrence and poorly connected, with patches isolated by other habitat types.

Modified Land: This habitat was not observed in person during field surveys. However, based on TASVEG mapping, it largely occurs in small areas in the northwest of the study area, likely to be dams or quarries. This land type occupies a relatively small proportion of the study area (less than 0.2%).

Figure **4**: Whaleback Ridge Wind Farm Fauna Habitat Assessment

Project: Whaleback Ridge Wind Farm

Client: West Coast Renewables Pty Ltd

Date: 8/11/2022

Wind farm study boundary

Vegtation Classification

- Aquatic
- Buttongrass
- Dry eucalypt forest and woodland
- Heathland
- Modified land
- Non eucalypt forest and woodland
- Other scrub
- Other sedgeland, rushland
- Potential rocky habitat
- Rainforest and related scrub
- Wet eucalypt forest and woodland
- Wet scrub

N

Metres

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4.6. Fauna species

4.6.1. Species recorded

During field assessments in 2021 and 2022, 42 fauna species have been recorded. This included 36 bird (1 introduced) and 10 mammal (one introduced), one reptile and two frog species (Appendix 1). Surveys so far have only targeted birds and bats – the lack of observations of species from other fauna groups is likely because these have not been specifically targeted during the targeted surveys.

4.6.2. Listed species

The review of existing information including the Tasmanian Natural Values Atlas (NVA) and the results of the EPBC Protected Matters Search Tool (Department of Climate Change, Energy, the Environment and Water 2022a) indicated that within the search region there were records of, or potential suitable habitat occurred for, 23 fauna species listed under the Commonwealth EPBC Act and the state TSP Act. The likelihood of occurrence of these species in the study area was assessed and the results are presented in Table 3-5.

This analysis of potential occurrence of listed fauna species excludes the following:

- Marine fauna given that the study area is terrestrial; and
- Migratory oceanic bird species (such as albatrosses and petrels) and migratory shorebirds given that the study area is mostly inland.

Species considered 'likely to occur' are those with very high potential of occurring in the study area given the existence of numerous records in the search region and suitable habitat in the study area. Using the precautionary approach, species considered to have the 'potential to occur' are those for which suitable habitat exists, but recent records are scarce.

Species with potential to occur within turbine development area

This analysis indicates that five listed bird species and three listed mammal species have the potential to occur within the turbine development area:

Bird species

- Blue-winged Parrot (EPBC: Vulnerable);
- Fork-tailed Swift (EPBC: Migratory);
- Tasmanian Wedge-tailed Eagle (EPBC: Endangered; TSP: Endangered);
- White-throated Needletail (EPBC: Vulnerable and Migratory);
- White-bellied Sea-eagle (TSP: Vulnerable)

Mammals

- Spot-tailed Quoll (Tasmanian population) (EPBC: Vulnerable; TSP: Rare);
- Tasmanian Devil (EPBC: Endangered; TSP: Endangered);

Species with potential to occur within turbine exclusion zones

Six listed bird species, one fish and two snail species have the potential to occur within the turbine exclusion zones:

Bird species

- Azure Kingfisher (Tasmania) (EPBC: Endangered; TSP: Endangered);

- Latham's Snipe (EPBC: Migratory);
- Orange-bellied Parrot (EPBC: Critically Endangered; TSP: Endangered);
- Satin Flycatcher (EPBC: Migratory);
- Masked Owl (Tasmanian) (EPBC: Vulnerable);
- Grey Goshawk (TSP: Endangered);

Fish and Invertebrates

- Australian Grayling (EPBC: Vulnerable; TSP: Vulnerable);
- Heazlewood River Hydrobiid Snail (TSP: Rare); and
- Little Henty River Hydrobiid Snail (TSP: Rare).

The susceptibility of these species to impacts from development is discussed in Section 4.6.3.

Table 3: Listed bird species and their likelihood of occurrence in the study area

Common Name	Scientific name	TSP	EPBC -Thrt	EPBC - Mig	Habitat	Date of last record	Likelihood of occurrence
Birds							
Potential to occur within turbine development area							
Blue-winged Parrot	*Neophema chrysostoma*		Vulnerable		Blue-winged parrots breed on mainland Australia south of the Great Dividing Range in southern Victoria from Port Albert in Gippsland west to Nelson, and sometimes in the far south-east of South Australia, and the north-western, central and eastern parts of Tasmania (Emison et al. 1987; Higgins 1999). A partial migrant, variable numbers of birds migrate across Bass Strait in winter, apparently making the flight non-stop based on the scarcity of records from the Bass Strait islands. During the non-breeding period, from autumn to early spring, birds are recorded from northern Victoria, eastern South Australia, south-western Queensland and western New South Wales, with some birds reaching south-eastern New South Wales and eastern Victoria, particularly on the southern migration (Higgins 1999).	N/A	This species has been **recorded** during bird utilisation surveys in low numbers in the study area.
Fork-tailed Swift	*Apus pacificus*			M (CAMBA, ROKAMB, JAMBA)	The species can occur in wet sclerophyll forest but mainly prefers open forest or plains. It is almost exclusively aerial and feeds up to hundreds on metres above the ground, but can feed among open forest canopy. The species breeds internationally and seldom roosts in trees (Higgins 1999).	N/A	Can occur over most habitats, but no records from the search region. Not recorded during avifauna surveys. **Potential to occur** as a flyover.
Tasmanian Wedge-tailed Eagle	*Aquila audax subsp. fleayi*	Endangered	Endangered		Inhabits a wide range of open to lightly timbered habitats suitable for foraging and where there are trees suitable for nesting (Marchant & Higgins 1993).	2-Jun-22	**Recorded** in low numbers and low utilisation across the study area. Foraging range could occur across study area.
White-bellied Sea-Eagle	*Haliaeetus leucogaster*	Vulnerable			Maritime habitats, terrestrial large wetlands and coastal lands of tropical and temperate Australia and offshore islands, ranging far inland only over large rivers and wetlands. The eagles usually breed on coast and offshore islands and inland beside large lakes or rivers, usually in tall trees in or near water, also in cliffs, rock pinnacles and escarpments (Marchant & Higgins 1993).	23-Apr-18	This species was seen near the study area during targeted surveys. There are recent records of this species along the coastline and coastal section of the study area. **Likely to occur**.
White-throated Needletail	*Hirundapus caudacutus*		Vulnerable	M (CAMBA, ROKAMB, JAMBA)	Aerial, over all habitats, but probably more over wooded areas, including open forest and rainforest. Often over heathland and less often above treeless areas such as grassland and swamps or farmland (Higgins 1999).	4-Jan-15	**Recorded** across the study area flying over a variety of habitats.
Potential to occur within turbine exclusion zones							
Azure Kingfisher (Tasmania)	*Ceyx azureus subsp. diemenensis*	Endangered	Endangered		Typically found in a diverse range of vegetation (including trees, reed beds and bamboo) at edges of wetlands (Roberts and Ingram 1976, Higgins 1999), particularly with still or slow-flowing water (Crawford 1972, Leach 1988), preferring freshwater habitats in the southern parts of its range. Can forage in shallow water (a few centimetres deep) (Marshall 1931). Nests above flood line in burrows excavated into various banks adjacent to wetlands, or sometimes cuttings, rubbish tips, graded roads or in earth among roots of large fallen trees (Higgins 1999). In Tasmania, found along several river systems in south, west, and north-west coasts, and potentially in several isolated areas in the north-east and centre (DEWHA 2010).	14-Nov-20	There are no records of this species within the study area. There are records of this species 7km to the north of the study area. This species was not recorded during bird utilisation surveys. Suitable habitat may occur in the study area adjacent to rivers and creeks. **Likely to occur.**

Common Name	Scientific name	TSP	EPBC -Thrt	EPBC - Mig	Habitat	Date of last record	Likelihood of occurrence
Birds							
Grey Goshawk	*Accipiter novaehollandiae*	Endangered			Inhabit rainforests, open forests, swamp forests, woodlands and plantations; most abundant where forest or woodland provide cover for hunting from perches. in Vic., most common in Otway ranges (Marchant & Higgins 1993).	12-Apr-22	One record of this species occurs in the study area with some records within 5km of the study area. Potential habitat occurs in the study area in the form of forests and woodland within gullies. **Likely to occur.**
Latham's Snipe	*Gallinago hardwickii*			M (Bonn A2H, ROKAMB, JAMBA)	Occurs in wide variety of permanent and ephemeral wetlands; it prefers open freshwater wetlands with dense cover nearby, such as the edges of rivers and creeks, bogs, swamps, waterholes. The species is widespread in southeast Australia and most of its population occurs in Victoria, except in the northwest of the state (Naarding 1983; Higgins & Davies 1996).	N/A	Some potential habitat occurs in the form shallow and vegetated swamps, but no records from the search region. This species was not recorded during avifauna surveys. **Potential to occur.**
Masked Owl (Tasmanian)	*Tyto novaehollandiae castanops (Tasmanian population)*		Vulnerable		Occurs in a variety of wooded habitats with tall or dense mature trees with large hollows for nesting and roosting, and nearby open areas for foraging (Peake et al. 1993, Higgins 1999). In Tasmania, mainly in old-growth open dry sclerophyll forest, tall open forest, woodland and tall woodland dominated by Manna Gum (DEWHA 2010). Nests in large hollows and near-vertical spouts of trees, usually living but sometimes dead (Higgins 1999). In Tasmania, mostly nests near edge of dry open forest (Higgins 1999). Widespread and abundant in mainland Tasmania, mainly in east (although absent from far northeast) (Higgins 1999). Scattered records along north coast, but rarely recorded from west or southwest coast (although this may be due to low survey effort) (Higgins 1999, DEWHA 2010).	N/A	There are no records of this species within the study area or within 10km search area of this site. Potential habitat on site in treed gullies, as well as immediately adjacent to site in large forested areas. Known habitat from the surrounding region is connected to potential habitat within the study area. **Potential to occur.**
Orange-bellied Parrot	*Neophema chrysogaster*	Endangered	Critically Endangered		The Orange-bellied Parrot is endemic to south-eastern Australia. It breeds at Melaleuca in Tasmania during the spring/summer months (DELWP 2016a), where they may be found in vegetable gardens near breeding sites (Higgins 1999). Within Tasmania, usually occurs within 30km of coast (Higgins 1999), inhabiting complex, near-coastal buttongrass plains, moors and sedgelands, with creek-lines dominated by paperbarks (*Melaleuca*) and patches of Smithton Peppermint (*Eucalyptus nitida*) forest present in the landscape (Higgins 1999). When migrating through west and northwest Tasmania, can occur in dunes, heathland, coastal grasslands and saltmarsh (Higgins 1999). On islands within the Bass Strait: occurs in low estuarine saltmarsh dominated by Beaded Glasswort and Shrubby Glasswort, with scattered reeds and adjacent dense Swamp Paperbark scrub (Higgins 1999); also in grassy areas, including pasture and golf courses (Jarman 1965, Higgins 1999), as well as on beaches (Higgins 1999).	18-Mar-02	There are no records of Orange-bellied Parrot within the study area. There was one recorded at the edge of the study area, flying along the coast during the avifauna surveys 2021/2022. There are some records of Orange-bellied Parrots along the coast within 10km of the study area. Expected to fly primarily along the coast. **Potential to occur.**
Satin Flycatcher	*Myiagra cyanoleuca*			M (Bonn A2H)	Mostly found in eucalypt forest, particularly tall wet forests and woodland within gullies (Higgins et al. 2006). Also inhabits eucalypt woodland comprising an open understorey and a grassy ground layer (Higgins et al. 2006). Generally absent from rainforest (Higgins et al. 2006).	N/A	There are no records of this species within the study area or within 10km of the study area. Suitable habitat in study area in the form of eucalypt woodland and wet forest within gullies. **Potential to occur.**
No suitable habitat / unlikely to occur							
Australian Fairy Tern	*Sternula nereis subsp. nereis*	Vulnerable	Vulnerable		Generally restricted to sheltered coasts both on the mainland, and inshore and offshore islands. Occurs in embayment, such as harbours, inlets, bays, estuaries, lagoons, and ocean beaches. Also found on lakes and salt ponds (Higgins & Davies 1996).	17-Nov-09	No suitable habitat in study area. Not recorded during bird utilisation surveys. **Unlikely to occur.**

Common Name	Scientific name	TSP	EPBC -Thrt	EPBC - Mig	Habitat	Date of last record	Likelihood of occurrence
Birds							
Australasian Bittern	*Botaurus poiciloptilus*		Endangered		Terrestrial wetlands, including a range of wetland types but prefers permanent water bodies with tall dense vegetation, particularly those dominated by sedges, rush, reeds or cutting grass (Marchant & Higgins 1990).	N/A	No suitable habitat in study area as this species prefers shallow wetlands with dense vegetation. Not recorded during bird utilisation surveys. **Unlikely to occur.**
King Island Scrubtit	*Acanthornis magna subsp. greeniana*	Endangered	Critically Endangered		Endemic to King Island, where it inhabits damp fern gullies in remnant wet sclerophyll forest and tall, undisturbed Swamp Paperbark (*Melaleuca ericifolia*) scrub in gullies (McGarvie and Templeton 1974, Higgins and Peter 2002). Also occurs in *Melaleuca ericifolia* swamp forest with a well-developed understory (TSS 2012). Known to persist only at Nooks Swamps and Colliers Swamp but may also exist in Pegarah State Forest and Lavinia State Reserve (TSS 2012).	N/A	Endemic to King Island. **Unlikely to occur.**
Swift Parrot	*Lathamus discolor*	Endangered	Critically Endangered		In Tasmania, mainly in east, with some breeding in north and unconfirmed small numbers breeding on west coast (Higgins 1999). Prefers grassy forest and woodland dominated by Tasmanian Blue Gum but will use areas dominated by other species with clumps of Tasmanian Blue Gum (Higgins 1999). Can occur in wet sclerophyll forest, but rare in temperate rainforest or subalpine habitat (Higgins 1999). Often in rural and urban areas with scattered or isolated Tasmanian Blue Gum, and in exotic and street trees, orchards, vineyards and sometimes artificial structures, but urban breeding rare (Hindwood 1938, Hindwood and Sharland 1964, Ratkowsky and Ratkowsky 1977, 1980, Higgins 1999). Nests in tree hollows in dead or over-mature *Eucalyptus* trees (usually Tasmanian Blue Gum, Messmate, or White Peppermint with DBH >0.7 m), <5 km from feeding sites (Higgins 1999). Typically breeds from sea level to 500 m a.s.l. in open scrubby or grassy eucalypt forest dominated by Messmate, and sometimes also Swamp Gum on dry slopes and ridges subject to burning (Higgins 1999). Feeds on nectar, especially from Tasmanian Blue Gum and Swamp Gum when breeding, Messmate, Alpine Ash, Mountain and Snow Gum (Legge 1929, Higgins 1999). Also feeds from outer foliage of psyllid-infested eucalypts, flower-spikes of grass trees, on ground among seeding grasses, in orchards or gardens with fallen fruit or lerp, and flowering, fruiting, and seeding exotic trees and shrubs (Batey 1907, Barnard and Barnard 1925, Hindwood and Sharland 1964, Higgins 1999). In temperate rainforest, may feed from Sassafras or Leatherwood (Higgins 1999). Roosts in dense eucalypt clumps, usually in topmost or outer dead branches of tall trees (Mellor and White 1913, Hindwood 1939, Hindwood and Sharland 1964, Higgins 1999).	23-Feb-94	Potential habitat exists in the study area within wet and dry sclerophyll forest and eucalypt woodland in gullies. However, no recent records from the search region, and atypical of western Tasmania. Not recorded during bird utilisation surveys. **Unlikely to occur.**
Australian Fairy Tern	*Sternula nereis nereis*	Vulnerable	Vulnerable		The Fairy Tern occurs in the following Natural Resource Management (NRM) regions North, North West and South Tasmania. The subspecies occurs in the following Interim Biogeographic Regionalisation for Australia (IBRA) Bioregions across Australia: Tasmanian South East; Tasmanian West; Tasmanian Southern Ranges; Tasmanian Northern Slopes and King (DCCEW 2023).	N/A	Coastal species. No suitable habitat within the study area. **Unlikely to occur.**

Notes: EPBC-T = threatened species status under EPBC Act; **EPBC-M =** migratory status under the EPBC Act (M = listed migratory taxa; Bonn Convention (A2H) - Convention on the Conservation of Migratory Species of Wild Animals – listed as a member of a family; Bonn Convention (A2S) - Convention on the Conservation of Migratory Species of Wild Animals - species listed explicitly; CAMBA - China- Australia Migratory Birds Agreement; JAMBA - Japan-Australia Migratory Birds Agreement; ROKAMBA - Republic of Korea Australia Migratory Birds Agreement); **TSP** = threatened species status under the TSP Act.

Table 4: Listed mammal species and their likelihood of occurrence in the study area

Common Name	Scientific name	TSP	EPBC -Thrt	Habitat	Date of last record	Likelihood of occurrence
Mammals						
Potential to occur within turbine development area						
Spotted-tail Quoll, Spot-tailed Quoll, Tiger Quoll (Tasmanian population)	*Dasyurus maculatus maculatus (Tasmanian population)*	Rare	Vulnerable	In Tasmania, prefers highly productive areas with predictable seasonal rainfall and relatively warm mean annual temperatures (DELWP 2016b). Recorded from rainforest, wet and dry sclerophyll forest (where high densities have been recorded), coastal heathland, scrub and dunes, woodland, heathy woodland, swamp forest, mangroves, beaches, and sometimes grassland or farmland adjacent to forest (Jones and Barmuta 2000, Andrew 2005, Dawson 2005, Glen and Dickman 2006, DELWP 2016b). Optimal habitat has large forest patches with adequate denning resources and relatively high densities of medium-sized mammalian prey (Belcher and Darrant 2006b, Glen and Dickman 2006, DELWP 2016b). Den sites, including maternal dens, located in rock crevices, caves, boulder tumbles, hollow logs, hollow tree roots and burrows (including those of rabbits, wombats, and of their own excavation in suitable substrate), with non-maternal dens also recorded in tree hollows, windrows, vegetation clumps, and under buildings (Burnett 2001, Kortner et al. 2004, Andrew 2005, Belcher and Darrant 2006a, DELWP 2016b). Many dens used (possibly >20/individual), with movements between them every 1-4 days (Burnett 2001, Kortner et al. 2004, Andrew 2005, Belcher and Darrant 2006a, DELWP 2016b). Large home ranges (88-5512 ha), overlapping between but not within sexes (Belcher and Darrant 2004, Andrew 2005, Claridge et al. 2005, DELWP 2016b).	1-Mar-19	There are three records of this species in the study area and some records adjacent to and within 5km of the study area. Potential habitat occurs in the study area in the form of coastal heath, potential rocky habitat, scrub, and wooded habitats in gullies. Additionally, large, forested habitats occur adjacent to the study area. **Likely to occur.**
Tasmanian Devil	*Sarcophilus harrisii*	Endangered	Endangered	Endemic to Tasmania and found throughout the island (DEWHA 2009). Known from various habitats, absent only from very high altitudes (Jones and Barmuta 2000, DEWHA 2009). Prefers open forests and woodland but can inhabit tall or dense wet forest as well as forestry plantations and pastures (Jones and Barmuta 2000, DEWHA 2009). Population densities lowest in button-grass plains of southwest Tasmania, and highest in mixed and dry sclerophyll forest and coastal heath of east and northwest (DEWHA 2009). Covers large distances as it forages (DEWHA 2009), implying a large home range. Various local declines reported but no local extinctions to date (DEWHA 2009).	16-Dec-20	Potential habitat occurs in the study area in the form of coastal heath and wooded habitat in gullies. Furthermore, the species is known to use Buttongrass plains, albeit in low densities. Recent records from search region. **Likely to occur**.
No suitable habitat / unlikely to occur						
Eastern Quoll	*Dasyurus viverrinus*		Endangered	Widespread in Tasmania but recorded infrequently from the relatively wet western third of the island (TSSC 2015). Associated with areas of low rainfall and low winter minimum temperatures (Fancourt 2015, Fancourt et al. 2015a). Within this range, uses a variety of habitats including open grassland and farmland, tussock grassland, grassy woodland, dry eucalypt forest, coastal scrub and alpine heathland. However, usually avoids large areas of wet eucalypt forest and rainforest (Rounsevell et al. 1991, Taylor and Comfort 1993, Fancourt et al. 2015b). Commonly associated with dry grassland/forest mosaics bounded by agricultural land, especially where pasture grubs are common (Blackhall 1980, Godsell 1983, Fancourt 2015). Sleeps in dens under rocks, hollow logs, or underground in burrows (TSSC 2015). Abundance and occurrence often patchy over short distances (TSSC 2015). Home ranges sizeable (average 35 ha for females, 44 ha for males), but non-territorial – home ranges of many individuals may overlap (TSSC 2015)	21-May-21	There are no records of this species in the study area. There are some records within 5 km of the project site, but these are thought to be outliers as the proposed wind farm site does not lie within the distribution range of this species. **Unlikely to occur**.

Common Name	Scientific name	TSP	EPBC -Thrt	Habitat	Date of last record	Likelihood of occurrence
Mammals						
Eastern Barred Bandicoot	*Perameles gunnii*		Vulnerable	Inhabits open habitats including open forests and woodlands with a grassy understory, and native and exotic grasslands (DEWHA 2008). Requires understory plants for shelter, nest sites and food (DEWHA 2008). Previously widely distributed across northern, central, and south-eastern Tasmania (Rousenvell et al. 1991). Currently, highest numbers in south-east, followed by north-eastern and north-western coastal region, and least common in central midlands and eastern coastal region (Mallick et al. 1997, DEWHA 2008).	N/A	There are no records of this species in the study area or within 10km of the study area. Potential habitat occurs in the study area in the form of heathland, potential rocky habitat and Buttongrass plains on the plateaus and slopes, and dry sclerophyll forest and eucalypt woodland in gullies. **Unlikely to occur.**

Table 5: Listed Fish, Amphibian, Reptile and Invertebrate species and their likelihood of occurrence in the study area

Common Name	Scientific name	TSP	EPBC -Thrt	Habitat	Date of last record	Likelihood of occurrence
Fish, Amphibians, Reptiles and Invertebrates						
Australian Grayling	*Prototroctes maraena*	Vulnerable	Vulnerable	Large and small coastal streams and rivers with cool, clear waters with a gravel substrate and altering pools and riffles (Cadwallader & Backhouse 1983).	26-Nov-87	Potential habitat could exist within creeks and rivers in the study area. No recent records from the search region, but this is a highly cryptic species that may not be detected outside of targeted surveys. **Potential to occur**.
Heazlewood River Hydrobiid Snail	*Phrantela marginata*	Rare		Very little information is available on this species. It is an aquatic species of snail inhabiting freshwater environments.	26-Dec-96	Potential habitat could exist within creeks and rivers in the study area. No recent records from the search region, but this is a highly cryptic species that may not be detected outside of targeted surveys. **Potential to occur**.
Little Henty River Hydrobiid Snail	*Phrantela conica*	Rare		Very little information is available on this species. It is an aquatic species of snail inhabiting freshwater environments.	31-Dec-13	Potential habitat could exist within creeks and rivers in the study area. Relatively recent records from the search region. **Potential to occur**.
Bowry Creek freshwater snail	*Beddomeia bowryensis*	Rare		Very little information is available on this species. It is an aquatic species of snail inhabiting freshwater environments.	N/A	Potential habitat could exist within creeks and rivers in the study area. No recent records from the search region, but this is a highly cryptic species that may not be detected outside of targeted surveys. **Potential to occur**.
Zeehan freshwater snail	*Beddomeia zeehanensis*	Rare		Very little information is available on this species. It is an aquatic species of snail inhabiting freshwater environments.	N/A	Potential habitat could exist within creeks and rivers in the study area. No recent records from the search region, but this is a highly cryptic species

Common Name	Scientific name	TSP	EPBC -Thrt	Habitat	Date of last record	Likelihood of occurrence
						that may not be detected outside of targeted surveys. **Potential to occur**.
Green and Gold Frog	*Litoria raniformis*	Vulnerable		The known range of the Green and Gold Frog includes coastal areas of south-eastern and northern Tasmania including King Island and Flinders Island, and inland around the Deloraine-Longford-Launceston region; historically the species was also common in the Midlands region but is now absent from this area. The potential range for the Green and Gold Frog is unlikely to extend far outside the currently known range. Breeding habitat for the Green and Gold Frog includes the following elements: still or slow-moving water bodies (lagoons, lakes, farm dams, ponds, irrigation channels, swamps, and slow-moving sections of rivers and streams); the species prefers the shallow part of lagoons (to approx. 1.5m) with a complex vegetation structure, often containing vegetation communities dominated by emergent plants such as water ribbons (Triglochin) and spikerush (Eleocharis), and submerged plants such as watermilfoil (Myriophyllum), marsh-flower (Villarsia), and pondweed (Potamogeton); however, other plant communities can also form suitable breeding habitat (DNRE 2023).	N/A	No records within the search region and no suitable habitat within the study area as no lagoons or farm dams or slow moving water bodies are present. **Unlikely to occur.**
Tussock skink	*Pseudemoia pagenstecheri*	Vulnerable		The known range of the Tussock Skink covers a number of widely scattered locations, ranging from The Domain near Hobart, through the lowland Midlands, extending to higher elevations near Cradle Mountain, and a single island in Bass Strait. The potential range of the Tussock Skink includes any areas of potential habitat within the known range. Habitat for the Tussock Skink corresponds to 'Lowland grassland', 'Highland grassland' and Grassy woodland and forest'. See Grassy Bush in the NRE Bushcare Toolkit for more information on managing these vegetation types (DNRE 2023)	N/A	No records within the search region and no suitable habitat within the study area as no grasslands present. **Unlikely to occur.**
Striped Marsh Frog	*Limnodynastes peroni*	Endangered		Eggs are laid as a foamy mass on the surface of most still water bodies, including fish ponds and abandoned swimming pools, often within vegetation at the edges. Tadpoles can reach a total length of up to 9.5 cm and are dark brown or black in colour. They often remain at the bottom of water bodies, and can take seven to eight months to develop into frogs. Breeds during spring to autumn. Occurs in Northern Tasmania.	N/A	No suitable habitat within the study area as no ponds or other still water bodies are present. **Unlikely to occur.**

4.6.3. Susceptibility of listed fauna to impacts

The following analysis identifies the susceptibility of listed fauna species that may utilise the study area to the development. This analysis includes consideration of the following factors:

- Mobility of the species;
- Availability and extent of other suitable habitat in the region and degree to which each species may rely on habitat in the study area; and
- Susceptibility to indirect disturbance and mortality from the construction, operation and de-commissioning of the wind farm.

Birds (non-migratory)

Seven listed non-migratory bird species were recorded or are considered to have the potential to occur in the study area. Three species in the turbine development areas and four species in turbine exclusion zones. The susceptibility of these species to possible impacts from the proposed development in the study area is discussed below.

- **Azure Kingfisher (Tasmania)** (EPBC Act: Endangered)

Suitable habitat for this species could occur in the form of vegetation and banks adjacent to rivers and creeks in the study area. All forested areas and waterways form part of turbine exclusion zones for the project. Whaleback Ridge Renewable Energy Project may involve the construction of some creek crossings in the exclusion zone, which could result in a small amount of habitat loss for this species. This species was not observed during surveys in 2021 (Nature Advisory 2022). If appropriate mitigation measures are used during construction, indirect impacts to their habitat (e.g. sedimentation, pollution) are also unlikely. The Tasmanian Azure Kingfisher is likely to be a sedentary resident that does not undertake large-scale movements (TSS 2012). Because of this, and the fact that they are a largely low-flying species, they are unlikely to fly at RSA height and collide with turbines or transmission lines.

- **Blue-winged Parrot** (EPBC Act: Vulnerable)

Blue-winged Parrots breed in Tasmania, coastal South Australia and southern Victoria. Before migrating from Tasmania in autumn, many birds congregate on saltmarshes and agricultural land before departing north, they occupy coastal, subcoastal and inland habitats ranging into semi-arid zones and inhabits grasslands, grassy woodlands and forest (Higgins 1999). They generally move in small flocks and while crossing open land they fly mostly at heights below 30 metres but occasionally at RSA heights.

This species was observed in small numbers during the BUS surveys with six individuals during autumn 2021 and three during summer 2022.

- **Grey Goshawk** (TSP Act: Endangered)

Suitable habitat for this species could occur in the form of eucalypt woodland and forest within gullies in the study area, as well as extensive forested habitat directly adjacent to the study area. Although the exact development footprint for Whaleback Ridge Wind Farm has not yet been finalised, all forested areas have been designated as turbine exclusion zones. The amount of habitat loss experienced by this species is therefore likely to be small.

Targeted raptor surveys were completed in 2021 and 2022 to understand raptor utilisation of the study area. No grey goshawks were recorded during the targeted raptor survey over the 16 survey days. This species was observed incidentally during overall natural values surveys at the wind farm

site (Nature Advisory 2022) and during helicopter nest searches. Typical behaviour is hunting from perches in the forest canopy and eating small mammals, birds and insects and sometimes carrion.

- **Masked Owl (Tasmanian)** (EPBC Act: Vulnerable)

Suitable habitat for this species could occur in the form of eucalypt woodland and forest within gullies in the study area, as well as extensive forested habitat directly adjacent to the study area. Masked Owl was not observed during surveys in 2021 (Nature Advisory 2022), but no nocturnal surveys were undertaken so far.

No Masked Owls were detected during the nocturnal studies for the neighbouring Granville Harbour Wind Farm and there have also been no mortalities detected during carcass monitoring that has been undertaken for two years of Granville Harbour Wind Farm Operations (pers. information Granville Harbour Wind Farm).

All forested areas of Whaleback Ridge Wind Farm are proposed to be turbine exclusions zones such that no clearing of trees will be undertaken for turbines. The amount of habitat loss experienced by this species is therefore likely to be small.

- **Orange-bellied Parrot** (EPBC Act: Critically Endangered; TSP Act: Endangered)

Targeted surveys during the Orange-bellied Parrot migration over two years have been completed up to 5km inland and no observations have been made beyond 50m from the coastline (Nature Advisory 2022). A single individual was found flying along the coast and resting in heathland approximately 35 metres form the coast in the northern section of the study area close to Foster's Creek (Figure 5, yellow star).

Of the 20 records in the Natural Values Atlas from the Whaleback Ridge and surrounding search region extending north to Pieman River, south to Strahan and inland to Zeehan (DPIPWE, 2021):

- Five are in a cluster around Strahan aerodrome (i.e. less than 1.5km from the coast and at the base of a peninsula);
- One is from the Pieman River (of unknown positional accuracy);
- One remaining appears to be from 4.7km inland but is labelled 'Granville Harbour [which is on the coast, may be inaccurate co-ordinates); and
- All other records are strictly coastal.

These records (Figure 5, blue stars) show that on migration north from their breeding grounds near Melaleuca, the bulk of the Orange-bellied Parrot population utilises strandline, coastal tussock grassland and coastal scrub vegetation types and rarely extend into low heath / button-grass plain further inland. Accordingly, there is no evidence of a significant number of Orange-bellied Parrot moving inland during their migration along this part of the western Tasmanian coastline.

The proponent advised that 1.5-kilometre wide turbine exclusion zones will be observed from the coast to minimise the risk of collision for this species and collisions with wind turbines are therefore unlikely.

No mortality of Orange-Bellied Parrot has been detected over the 2 years of operation of the neighbouring Granville Harbour Wind Farm which also has wind turbines 1.5 kilometres from the coast.

The proponent has participated in the Orange-bellied parrot tracking program for the Northerly 2023 migration. A radio receiver station was installed by the proponent at Granville Harbour to

improve understanding of migratory path of birds tagged during the trail. The proponent anticipates it will continue to participate in future tracking programs.

Figure 5: Orange -bellied Parrot records near Whaleback Ridge

- **Tasmanian Wedge-tailed Eagle** (EPBC Act: Endangered; TSP Act: Endangered)

This species was recorded across the study area in very low numbers during bird utilisation surveys and targeted surveys (Nature Advisory 2022). No active eagle nest was observed during aerial eagle nest surveys in October 2022 which included searching of the historic records of nest locations near Pieman Lake (Mooney 2022). No nests were found in the vicinity of the project site during previous surveys for Granville Harbour Wind Farm and Heemskirk Wind Farm.

The prey of the Wedge-tailed Eagle occurs in grassland, woodland and forested habitats. These habitats are absent from where turbines are proposed at Whaleback Ridge Renewable Energy Project, suggesting that the Wedge-tailed Eagle is less likely to frequent areas where turbines are proposed as their food source is in relatively low abundance in these areas. This accounts for the low Wedge-tailed Eagle activity rate across the study area.

The number of Wedge-tailed Eagle pairs utilising the study area was estimated to be very low compared to other part of Tasmania (Nature Advisory 2022). The neighbouring Granville Harbour Wind Farm has had no Wedge-tailed Eagle mortalities during either construction or operation.

All forested areas of Whaleback Ridge Renewable Energy project are proposed to be turbine exclusions zones such that no clearing of trees will be undertaken for turbines. Given no nests have been found in the study area it is unlikely any breeding activity will be disturbed. If any nests are found the size of the project area should allow for additional exclusion zones to be established around the nests so no impact on breeding activity will occur.

- **White-bellied Sea-eagle** (TSP Act: Vulnerable)

The proximity of Whaleback Ridge Renewable Energy Project to the coast and to large water bodies (i.e. Lake Pieman), as well as the wide-ranging flight behaviour of this species mean that White-bellied Sea-eagle could potentially fly into the study area although it was only observed incidentally close to the coast during surveys in 2021 (Nature Advisory 2022). No formal observations of White-bellied Sea Eagle were made during the 16-day targeted raptor surveys completed in 2021 and 2022.

Infrastructure will generally be situated away from aquatic habitats, which will mean any habitat loss this species experiences due to the construction of the wind farm is likely to be minimal. All forested areas and riparian habitats of Whaleback Ridge Renewable Energy project are proposed to be turbine exclusions zones such that no clearing of trees will be undertaken for turbines. Given no nests have been found in the study area it is unlikely any breeding activity will be disturbed. If any nests are found the size of the project area should allow for additional exclusion zones to be established around the nests so no impact on breeding activity will occur.

Migratory Birds

Four listed migratory bird species (excluding oceanic species and shorebirds) have been recorded or have the potential to occur in the study area. The susceptibility of these species to possible impacts from the proposed development in the study area is discussed below.

- **Fork-tailed Swift** (EPBC Act: Migratory)

This highly aerial species can occur over most habitats as a flyover, as they forage for flying insects. They are unlikely to directly rely on any habitat resources within the study area. The species is unlikely to make heavy use of the study area, being more commonly found further north on the islands of the Bass Strait and Australian mainland. This species was not detected during the bird utilisation surveys in the study area (Nature Advisory 2022) nor was it detected during similar studies for the neighbouring Granville Harbour Wind Farm, of which there have been no mortalities of the Fork-tailed Swift.

- **Latham's Snipe** (EPBC Act: Migratory)

Small areas of potential habitat for the species in the form of shallow and vegetation swamps and ephemeral wetlands are present in the study area. These areas have been designated as turbine

exclusion zones. Given the small amount of habitat present and the highly mobile nature of this species, Latham's Snipe is unlikely to be present in significant numbers.

Most of the wind farm infrastructure will generally be situated away from aquatic habitats, which will mean any aquatic habitat loss this species experiences due to the construction of the wind farm is likely to be minimal.

Shorebirds, including Latham's Snipe, generally make local flight movements at a low height, likely below the minimum RSA height of 87.5 metres. When they undertake large-scale migratory movements, which generally occurs twice a year, they generally fly at very high altitudes (AB ESRD 2011). Although ascending to this altitude will involve flying at RSA height, their flight trajectory is extremely steep and minimises the time spent flying at RSA height (AB ESRD 2011) – they would ascend beyond the maximum RSA height of 242.5 metres very rapidly, which reduces the likelihood of collision. A study analysing mortality data from many wind farms, including some located near coastal or wetland habitats, found no migratory shorebirds were ever recorded as a casualty (Moloney *et al*. 2019), corroborating this conclusion.

- **Satin Flycatcher** (EPBC Act: Migratory)

Suitable habitat for this species could occur in the form of eucalypt woodland and forest within gullies in the study area, as well as extensive forested habitat directly adjacent to the study area. Although the exact development footprint for Whaleback Ridge Wind Farm has not yet been finalised, it is planned to avoid the removal of trees for turbine construction. The amount of habitat loss experienced by this species is therefore likely to be small.

No records of this species occur in the study area but given the habitat present and the likely low amount of survey effort in this relatively remote region, they could potentially be present at some point during the life of Whaleback Ridge Wind Farm. This species is unlikely to fly at RSA height and is therefore unlikely to be Susceptible to turbine collision.

- **White-throated Needletail** (EPBC Act: Vulnerable and Migratory)

This highly aerial species can occur over most habitats as a flyover, as they forage for flying insects. They were recorded in relatively high numbers (up to 30 birds) across most of the study area during bird utilisation surveys (Nature Advisory 2022). The very fast and high-flying behaviour of this species can put it at a higher risk of collision with wind turbines than most other bird species. This species occurs sporadically during December to March at which times, when present on the project site would be susceptible to turbine collision (SPRAT 2022, Yamaguchi et al. 2021).

The species usually roosts in the canopy of trees in densely forested habitat, and may make use of tree hollows, but other than this not much is known about the characteristics of roosting sites. Planned avoidance of wooded areas in the wind farm development footprint means it is unlikely this species will experience habitat loss due to the construction of the wind farm.

Mammals

Two listed mammal species are considered to have the potential to occur in the study area. The susceptibility of these species to possible impacts from any development in the study area is discussed below.

- **Spot-tailed Quoll (Tasmanian population)** (EPBC Act: Vulnerable; TSP Act: Rare)
- **Tasmanian Devil** (EPBC Act: Endangered; TSP Act: Endangered)

The **Spot-tailed Quoll** is primarily dependent on forest habitat but can also occur in non-forested areas such as coastal scrub and heath and pastoral areas. It uses the following features as dens: rock crevices, hollow logs, hollow tree buttresses, tree hollows, windrows, clumps of vegetation, caves, boulder tumbles and underground burrows, including those of rabbits and wombats (DELWP 2016b). The particular use of a landscape is primarily related to prey-density and den availability. Critical habitat includes large forest patches with adequate denning resources and relatively high densities of medium sized mammal prey (DELWP 2016b).

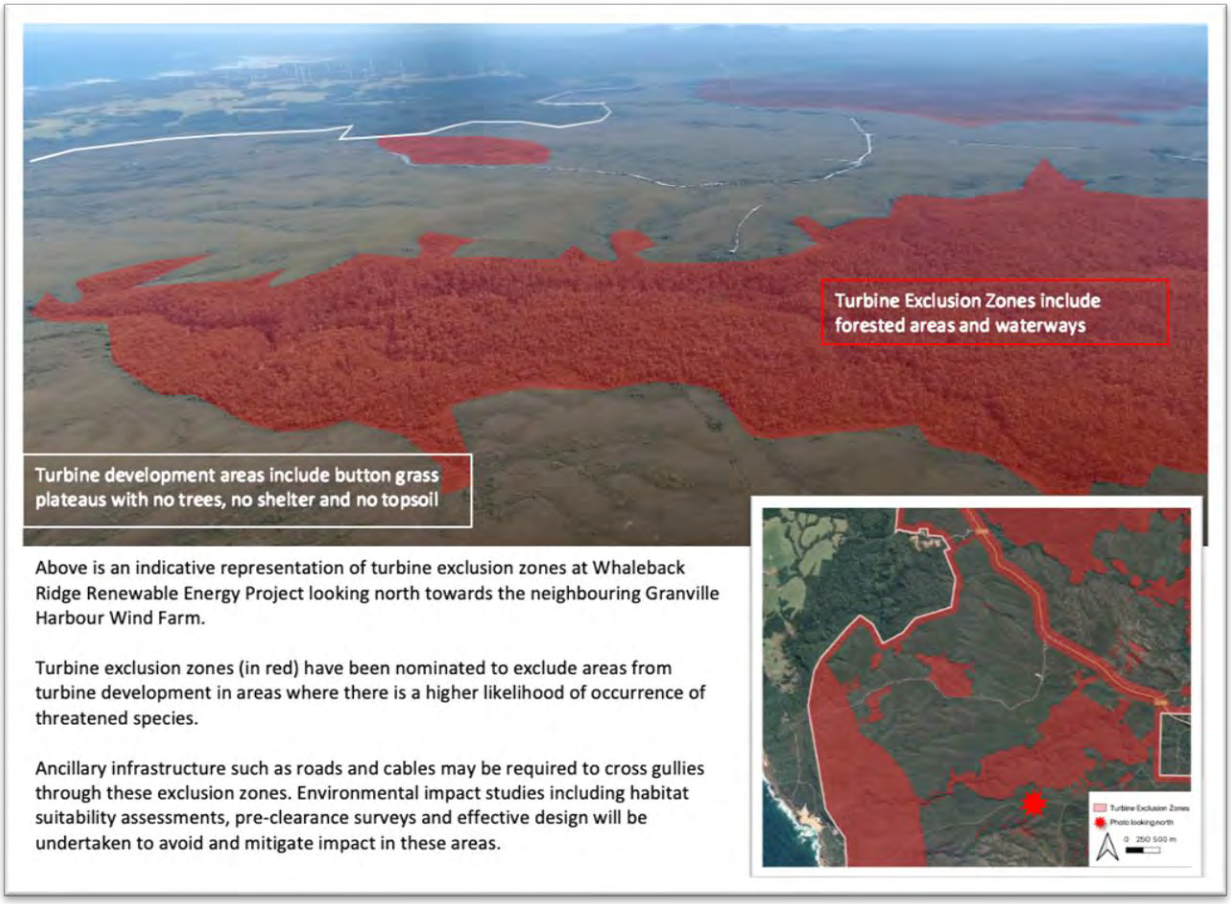
Tasmanian Devil habitat can be characterised as foll`ows (DNRE 2023):

- Breeding den habitat: areas of burrowable, well-drained soil or sheltered overhangs such as cliffs, rocky outcrops, knolls, caves and earth banks, free from risk of flooding
- Shelter habitat: dense vegetation, hollow logs, burrows or caves
- Foraging habitat: open understorey mixed with dense patches of dense vegetation which allow hunting.

Photograph 2: ***Typical button grass plateau at Whaleback Ridge (June 2022, left), undergoing fuel reduction burn (May 2022, right)***

The button grass plateaus that dominate the turbine development areas are poorly drained, exposed, treeless and lacking any topsoil. The areas are frequently burnt in summer (see photograph 2), sodden in winter and do not have burrowable soil to provide habitat for denning, shelter or foraging. During surveys in 2021 and 2022, the homogenous and exposed habitat of the buttongrass plateaus was found to provide low food availability for carnivores. It is unlikely devils and quolls would be using the button grass plateaus in the turbine development areas for denning habitat.

Areas of potentially suitable habitat for breeding, shelter and foraging may however be present within the forested gullies of the study area that form part of the turbine exclusion zones (see Figure below).



Disturbance to Spot-tailed Quoll and Tasmanian Devil habitat is therefore unlikely to occur for the construction and operation of the turbines. Ancillary infrastructure may require construction across the turbine exclusion zones such as roads, cables and transmission. Pre-clearance surveys and effective design to minimise disturbance footprint will be used to mitigate any potential impact. The percentage of the occupation of ancillary infrastructure in the turbine exclusion zones represents only a very small portion of the available habitat given large forested areas surrounding the site.

The construction and operation phase of the project will present risk of impact to Spot-tailed Quoll and Tasmanian Devil through increased traffic and risk of vehicle collision and mortality. Experience from mitigation measures put in place during the construction and current operation of Granville Harbour Wind Farm (adjacent to the project) have proven effective in managing incidental "road kill" of the Spot-tailed Quoll and Tasmanian Devil. Traffic measures including reduced speed, reduced traffic movement between dusk and dawn, verge mowing and protocols targeting frequent removal of any carcasses from roads and turbine areas will reduce the risk of collision with vehicles.

Fish

One listed fish species is considered to have the potential to occur in the study area. The susceptibility of this species to possible impacts from the proposed development in the study area is discussed below.

- **Australian Grayling** (EPBC Act: Vulnerable; TSP Act: Vulnerable)

Potential habitat for this species may exist within creeks and rivers in the study area. Although there are no recent records of this species, it is cryptic and detection is unlikely outside of targeted surveys, which are unlikely to have occurred recently as the study area occurs in a remote location with low survey effort. The construction of Whaleback Ridge Renewable Energy Project may involve creating some creek crossings, which could result in impacts (e.g. sedimentation, pollution) to their habitat, but this is unlikely if appropriate mitigation measures are adopted during construction. Most of the wind farm infrastructure will generally be situated away from aquatic habitats, which will mean any habitat loss this species experiences due to the construction of the wind farm is likely to be minimal.

Invertebrates

Two listed invertebrate species are considered to have the potential to occur in the study area. The susceptibility of these species to possible impacts from the proposed development in the study area is discussed together below:

- **Heazlewood River and Little Hently River Hydrobiid Snails** (TSP Act: Rare)

Potential habitat for these species may exist within creeks and rivers in the study area. These species are cryptic and detection is unlikely outside of targeted surveys, which are unlikely to have occurred recently as the study area occurs in a remote location with low survey effort. Both of these snails do not have records within the project site although there are some records within 3km of the site. The construction of Whaleback Ridge Renewable Energy Project may involve creating some creek crossings, which could result in impacts (e.g. sedimentation, pollution) to their habitats, but this is unlikely if appropriate mitigation measures are adopted during construction. However, most of the wind farm infrastructure will generally be situated away from aquatic habitats, which will mean any habitat loss these species experience due to the construction of the wind farm is likely to be minimal.

5. References

Alberta Environment and Sustainable Resource Development Agency (AB ESRD) 2011, *Wildlife Guidelines for Alberta wind energy projects*, Alberta Environment and Sustainable Resource Development Agency, Edmonton, Alberta, Canada.

Andrew DL 2005, 'Ecology of the tiger quoll *Dasyurus maculatus maculatus* in coastal New South Wales', Thesis (M.Sc), University of Wollongong, Wollongong, Australia.

Barnard CA and Barnard HG 1925, A review of the bird life on Coomooboo-Laroo station, Duaringa district, Queensland, during the past fifty years, *Emu* 24(4): 252-265.

Batey I 1907, On fifteen thousand acres: its bird-life sixty years ago. *Emu* 7(1): 1-17.

Belcher CA and Darrant JP 2004, Home range and spatial organization of the marsupial carnivore, Dasyurus maculatus maculatus (Marsupialia: Dasyuridae) in south-eastern Australia, *Journal of Zoology* 262(3): 271-280.

Belcher CA and Darrant JP 2006a, Den use by the spotted-tailed quoll Dasyurus maculatus in southeastern Australia, *Australian Mammalogy* 28(1): 59-64.

Belcher CA and Darrant JP 2006b, Habitat use by the tiger quoll (Dasyurus maculatus) (Marsupialia: Dasyuridae) in south-eastern Australia, *Journal of Zoology* 269: 183-190.

Biosis Research Pty Ltd 2002, Heemskirk Wind Farm – Avifauna Monitoring Survey, Project Number 2779.

Bitterns in Rice Project 2017. Tracking Bunyip Birds | Bitterns in Rice Project, accessed 01 November 2022, http://www.bitternsinrice.com.au/tracking-bunyip-birds/.

Blackhall S 1980, Diet of the Eastern Native-Cat, Dasyurus Viverrinus (Shaw), in Southern Tasmania, *Australian Wildlife Research* 7(2): 191-197.

Brett Lane & Associates Pty Ltd 2012, Granville Harbour Wind Farm – Matters of National Environmental Significance, Report No 11186(3.6), October 2012.

Burnett S 2001, 'The ecology and conservation status of the northern Spot-tailed Quoll *Dasyurus maculatus* with reference to the future of Australia's marsupial carnivores', Thesis (Ph.D), James Cook University, Townsville, Australia.

Cadwallader PL and Backhouse GN 1983, *A guide to the freshwater fish of Victoria*, US Government Printing Office, Washington D.C., United States of America.

Claridge AW, Paull D, Dawson J, Mifsud G, Murray AJ, Poore R and Saxon MJ 2005, Home range of the spotted-tailed quoll (*Dasyurus maculatus*), a marsupial carnivore, in a rainshadow woodland, *Wildlife Research* 32(1): 7-14.

Crawford DN 1972, Birds of Darwin area, with some records from other parts of Northern Territory, *Emu* 72(4): 131-148.

Department of Climate Change, Energy, the Environment and Water 2022a, *EPBC Act Protected Matters Search Tool*, Department of Climate Change, Energy, the Environment and Water, Canberra, viewed 30th September 2022, https://www.environment.gov.au/epbc/pmst/index.html.

Department of Climate Change, Energy, the Environment and Water 2022b, *Species Profile and Threats Database*, Department of Climate Change, Energy, the Environment and Water, Canberra, https://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl.

Dawson JP 2005, 'Impact of wildfire on the spotted-tailed quoll *Dasyurus maculatus* in Kosciuszko National Park, Thesis (M.Sc), University of New South Wales, Sydney, Australia.

Debus SJS 1993, The mainland Masked Owl 'Tyto novaehollandiae': A review, *Australian Bird Watcher* 15(4): 168-191.

Department of Environment, Land, Water and Planning (DELWP) 2016a, *National Recovery Plan for the Orange-bellied Parrot* Neophema chrysogaster, Australian Government, Canberra.

Department of Environment, Land, Water and Planning (DELWP) 2016b, *National Recovery Plan for the Spotted-tailed Quoll* Dasyurus maculatus, Australian Government, Canberra.

Department of Natural Resources and the Environment Tasmania (DNRE) 2022, *Natural Values Atlas 3.12.3*, Department of Natural Resources and the Environment Tasmania, Hobart, viewed 30th September 2022, https://www.naturalvaluesatlas.tas.gov.au/ .

Department of Natural Resources and the Environment Tasmania (DNRE) 2023, Threatened Species Link, Species management Profile – *Sacrophilus harrisii* Tasmanian Devil, Government of Tasmania 2023.

Department of the Environment, Water, Heritage and the Arts (DEWHA) 2008, *Approved Conservation Advice for* Perameles gunnii gunnii *(Eastern Barred Bandicoot (Tasmania))*, Department of the Environment, Water, Heritage and the Arts, Canberra, Australia.

Department of the Environment, Water, Heritage and the Arts (DEWHA) 2009, *Approved Conservation Advice for* Sarcophilus harrisii *(Tasmanian Devil)*, Department of the Environment, Water, Heritage and the Arts, Canberra, Australia.

Department of the Environment, Water, Heritage and the Arts (DEWHA) 2010, *Approved Conservation Advice for* Ceyx azureus diemensis *(Tasmanian Azure Kingfisher)*, Department of the Environment, Water, Heritage and the Arts, Canberra, Australia.

DNRE 2022, *Natural Values Atlas*, Department of Natural Resources and Environment, Hobart, https://www.naturalvaluesatlas.tas.gov.au/.

Fancourt BA 2015, 'Drought, disease or devil declines? Identifying the cause of decline of the eastern quoll, *Dasyurus viverrinus*. Implications for conservation and management', Thesis (Ph.D), University of Tasmania, Hobart, Australia.

Fancourt BA, Bateman BL, Van der Wal J, Nicol SC, Hawkins CE, Jones ME and Johnson CN 2015a, Testing the role of climate change in species decline: is the eastern quoll a victim of a change in the weather?, *PLoS ONE* 10(6): e0129420.

Fancourt BA, Hawkins CE, Cameron EZ, Jones ME and Nicol SC 2015b, Devil declines and catastrophic cascades: is mesopredator release of feral cats inhibiting recovery of the eastern quoll? *PLoS ONE* 10: e0119303.

Glen AS and Dickman CR 2006, Diet of the spotted-tailed quoll (*Dasyurus maculatus*) in eastern Australia: effects of season, sex and size, *Journal of Zoology* 269(2): 241-248.

Godsell J 1983, *Ecology of the eastern quoll* Dasyurus viverrinus *(Dasyuridae: Marsupialia)*. The Australian National University, Canberra, Australia.

Higgins PJ (ed) 1999, *Handbook of Australian, New Zealand and Antarctic Birds, Volume 4: Parrots to Dollarbird*. Oxford University Press, South Melbourne, Australia.

Higgins PJ and Davies SJJF (eds) 1996, *Handbook of Australian, New Zealand and Antarctic Birds, Volume 3:* , Oxford University Press, Melbourne, Australia.

Higgins PJ, Peter JM and Cowling SJ (eds) 2006, *Handbook of Australian, New Zealand and Antarctic Birds, Volume 7 Part A: Boatbill to Starling*s, Oxford University Press, Melbourne, Australia.

Higgins PJ and Peter JM (eds) 2002, *Handbook of Australian, New Zealand and Antarctic Birds, Volume 6: Pardalotes to Shrike-thrushes*, Oxford University Press, Melbourne.

Hindwood KA 1938, John Gould in Australia. *Emu* 38(2): 95-118.

Hindwood KA and Sharland M 1964, The swift parrot, *Emu* 63(4): 310-326.

Identiflight 2022, How Does a Bird Detection System Work?, viewed 01/01/2022, <https://www.identiflight.com/how-it-works>.

Jarman H 1965, The orange-breasted parrot, *Australian Bird Watcher* 2(6): 155-167.

Jones ME 2000, Road upgrade, road mortality and remedial measures: impacts on a population of eastern quolls and Tasmanian devils, *Wildlife Research* 27(3): 289-296.

Jones ME and Barmuta LA 2000, Niche differentiation among sympatric Australian dasyurid carnivores, *Journal of Mammalogy* 81(2): 434-447.

Kortner G, Gresser S, Mott B, Tamayo B, Pisanu P, Bayne P and Harden R 2004, Population structure, turnover and movement of spotted-tailed quolls on the New England Tablelands, *Wildlife Research* 31: 475-484.

Leach GJ 1988, Birds of Narayen research station, Mundubbera, south-east Queensland, *The Sunbird* 18(3): 55-75.

Legge RW 1929, The Swift Parrot in Tasmania, *Emu* 28(4): 292-294.

LISTmap - Land Information System Tasmania (thelist.tas.gov.au) 2022

Mallick SA, Driessen MM and Hocking GJ 1997, Diggins as a population index for the eastern barred bandicoot, *Journal of Wildlife Management* 61: 1378-1383.

Marchant S and Higgins PJ (eds) 1990, *Handbook of Australian, New Zealand and Antarctic Birds, Volume 1: Ratites to Ducks*, Oxford University Press, Melbourne, Australia.

Marchant S, Higgins PJ and Davies JN 1993, *Handbook of Australian, New Zealand and Antarctic Birds, Volume 2: Raptors to Lapwings*, Oxford University Press, Melbourne, Australia.

Marshall AJ 1931, The Azure Kingfisher, *Emu* 31(1): 44-47.

McGarvie AM and Templeton MT 1974, Additions to the birds of King Island, Bass Strait. *Emu* 74(2): 91-96.

Mellor JW and White SA 1913, Flinders Island camp-out, *Emu*_12(3): 158-164.

Michniewicz RJ and Danvers J 2021, Use of a combined drainage/fauna underpass by the Spotted-tailed Quoll, *Dasyurus maculatus*, *Australian Zoologist* 41(2): 283-286.

Moloney PD, Lumsden LF and Smales I 2019, *Investigation of existing post-construction mortality monitoring at Victorian wind farms to assess its utility in estimating mortality rates*, Arthur

Rylah Institute for Environmental Research Technical Report Series No. 302, Department of Environment, Land, Water and Planning, Heidelberg, Victoria, Australia.

Naarding JA 1983, *Latham's Snipe,* Gallinago hardwickii *in Southern Australia*. National Parks and Wildlife Service, Australia.

Natural Values Atlas 2008, *Veronica novae-hollandiae*, Department of Primary Industries and Water, Hobart.

Nature Advisory 2021, *Site description* - Report No. 20209.3 (draft), Nature Advisory Pty Ltd, Hawthorn East.

Nature Advisory 2022, *Bird and Bat Assessments 2021-2022*. Report for West Coast Renewable Energy Pty Ltd., Nature Advisory Pty Ltd, Hawthorn East, Australia. Report No. 20209 (1.1).

National Environmental Science Program Threatened Species Recovery Hub (NESP TSRH) 2019, *Threatened Species Strategy Year 3 Scorecard – Australasian Bittern*, National Environmental Science Program Threatened Species Research Hub, Canberra, Australia, < https://www.dcceew.gov.au/sites/default/files/env/pages/fce71af8-5ac3-4e60-a981-277fcbf1af35/files/australasian-bittern-year-3-scorecard.pdf>.

Peake P, Conole LE, Debus SJS, McIntyre A and Bramwell M 1993, The Masked Owl '*Tyto novaehollandiae*' in Victoria, *Australian Bird Watcher* 15(3): 124-136.

Ratkowsky AV and Ratkowsky DA 1977, The birds of Mt. Wellington Range, Tasmania, *Emu* 77(1): 19-22.

Ratkowsky AV and Ratkowsky DA 1980, A survey of the birds of two areas of sclerophyll bushland in southern Tasmania, *Emu* 80(3): 169-170.

Roberts GJ and Ingram CJ 1976, An annotated list of the land birds of Cooloola, *The Sunbird*, 7(1): 1-20.

Rousenvell DE, Taylow RJ and Hocking GJ 1991, Distribution records of native terrestrial mammals in Tasmania, *Wildlife Research* 18: 699-717.

Rubolini D, Gustin M, Bogliani G and Garavaglia R 2015, Birds and powerlines in Italy: an assessment, *Bird Conservation International* 15: 131-145. < doi:10.1017/S0959270905000109>.

State Wide Integrated Flora and Fauna Teams (SWIFFT) 2022a, Australasian Bittern, viewed 01/01/2022, <https://www.swifft.net.au/cb_pages/sp_australasian_bittern.php#:~:text=The%20Australasian%20Bittern%20stands%20nearly,the%20side%20of%20the%20neck.>

State Wide Integrated Flora and Fauna Teams (SWIFFT) 2022b, Orange-bellied Parrot, viewed 01/01/2022, <https://www.swifft.net.au/cb_pages/sp_orange-bellied_parrot.php>.

Taylor RJ and Comfort MD 1993, Small terrestrial mammals and bats of Melaleuca and Claytons, southwestern Tasmania, *Papers and Proceedings – Royal Society of Tasmania* 127: 33-37.

Threatened Species Scientific Committee (TSSC) 2015, *Conservation Advice* Dasyurus viverrinus *eastern quoll*, Department of the Environment, Canberra, Australia.

Threatened Species Section 2010, *Listing Statement for Orthoceras strictum (horned orchid),* Department of Primary Industries, Parks, Water and Environment, Tasmania.

Threatened Species Section (TSS) 2012a, *Listing Statement for* Ceyx azureus subsp. diemensis *(Azure Kingfisher)*, Department of Primary Industries, Water and Environment, Hobart, Australia.

Threatened Species Section (TSS) 2012b, *King Island Biodiversity Management Plan*, Department of Primary Industries, Water and Environment, Hobart, Australia.

Threatened Species Section (TSS) 2016, *Notesheet for Comesperma defoliatum (leafless milkwort),* Department of Primary Industries, Parks, Water and Environment, Tasmania.

Threatened Species Section (TSS) 2022, *Species Management Profile for Tasmania's Threatened Species Link*, Department of Natural Resources and Environment Tasmania, Hobart.

University of Tasmania 2019, *P. intermedia – Key to Tasmanian Dicots*, University of Tasmania, Tasmania.

University of Tasmania 2019, *R. acaulis – Key to Tasmanian Dicots*, University of Tasmania, Tasmania.

West Coast Renewable Energy Pty Ltd 2020, *Preliminary Assessment and Approval Summary for Project Renewable Future,* West Coast Renewable Energy Pty Ltd, Zeehan, Tasmania.

Yamaguchi NM, Mori S, Yonekawa H, Waga D and Higuchi H 2021, Light-level geolocators reveal that white-throated needletails (*Hirundapus caudacutus*) follow a figure-eight migration route between Japan and Australia, *Pacific Science* 75(1): 75-84.

Appendix 1: Fauna species recorded in the study area

Origin	Common Name	Species Name	EPBC-T	EPBC-M	TSP
Birds					
	Australian Pipit	*Anthus australis*			
	Beautiful Firetail	*Stagonopleura bella*			
	Black Currawong	*Strepera fuliginosa*			
	Black-faced Cuckoo-shrike	*Coracina novaehollandiae*			
	Blue-winged Parrot	*Neophema chrysostoma*	Vulnerable		
	Brown Falcon	*Falco berigora*			
	Brown Goshawk	*Accipter fasciatus*			
	Brush Bronzewing	*Phaps elegans*			
	Collared Sparrowhawk	*Accipter cirrocephalus*			
	Crescent Honeyeater	*Phylidonyris pyrrhopterus*			
	Dusky Robin	*Melanodryas vittate*			
	Eastern Spinebill	*Acanthorhynchus tenuirostris*			
*	European Goldfinch	*Carduelis carduelis*			
	Flame Robin	*Petroica phoenicea*			
	Forest Raven	*Corvus tasmanicus*			
	Golden Whistler	*Pachycephala pectoralis*			
	Green Rosella	*Platycercus caledonicus*			
	Grey Fantail	*Rhipidura albiscapa*			
	Grey Goshawk	*Accipiter novaehollandiae*			Endangered
	Grey Shrike-thrush	*Colluricincla harmonica*			
	Ground Parrot	*Pezoporus wallicus*			
	New Holland Honeyeater	*Phylidonyris novaehollandiae*			
	Olive Whistler	*Pachycephala olivacea*			
	Orange-bellied Parrot	*Neophema chrysogastera*	Critically endangered		Endangered
	Peregrine Falcon	*Falco peregrinus*			
	Silvereye	*Zosterops lateralis*			
	Southern Emu-wren	*Stipturus malachurus*			
	Striated Fieldwren	*Calamanthus fuliginosus*			
	Superb Fairy-wren	*Malurus cyaneus*			
	Swamp Harrier	*Circus approximans*			
	Tasmanian Scrubwren	*Sericornis humilis*			
	Tasmanian Thornbill	*Acanthiza ewingii*			
	Tree Martin	*Petrochelidon nigricans*			
	Wedge-tailed Eagle	*Aquila audax fleayi*	Endangered		
	Welcome Swallow	*Hirundo neoxena*			
	White-fronted Chat	*Epthianura albifrons*			

Origin	Common Name	Species Name	EPBC-T	EPBC-M	TSP
	White-throated Needletail	*Hirundapus caudacutus*	Vulnerable	CAMBA, JAMBA, ROKAMBA	
	Yellow-tailed Black Cockatoo	*Calyptorhynchus funereus*			
	Yellow-throated Honeyeater	*Nesoptilotis flavicollis*			
Mammals					
	Bare-nosed Wombat	*Vombatus ursinus*			
	Eastern Falsistrelle	*Falsistrellus tasmaniensis*			
*	European Rabbit	*Oryctolagus cuniculus*			
	Gould's Wattled Bat	*Chalinolobus gouldii*			
	Large Forest Bat	*Vespadelus darlingtoni*			
	Lesser Long-eared Bat	*Nyctophilus geoffroyi*			
	Little Forest Bat	*Vespadelus vulturnus*			
	Red-necked Wallaby	*Notamacropus rufogriseus banksianus*			
	Tasmanian Long-eared Bat	*Nyctophilus sherrini*			
	White-striped Freetail Bat	*Austronomous australis*			
Reptiles					
	White-lipped Snake	*Drysdalia coronoides*			
Frogs					
	Common Froglet	*Crinia signifera*			
	Tasmanian Froglet	*Crinia tasmaniensis*			

Notes: EPBC-T = Threatened species status under EPBC Act; **EPBC-M**: Migratory status under the EPBC Act (M = listed migratory taxa; Bonn Convention (A2H) – Convention on the Conservation of Migratory Species of Wild Animals – listed as a member of a family; Bonn Convention (A2S) – Convention on the Conservation of Migratory Species of Wild Animals – species listed explicitly; CAMBA – China-Australia Migratory Birds Agreement; JAMBA – Japan-Australia Migratory Birds Agreement; ROKAMBA – Republic of Korea Australia Migratory Birds Agreement); **TSP:** = Threatened species status under the TSP Act; * = introduced to Tasmania.

Appendix 2: Natural Values Atlas Report (11th May 2023)

Natural Values Atlas Report

Authoritative, comprehensive information on Tasmania's natural values.

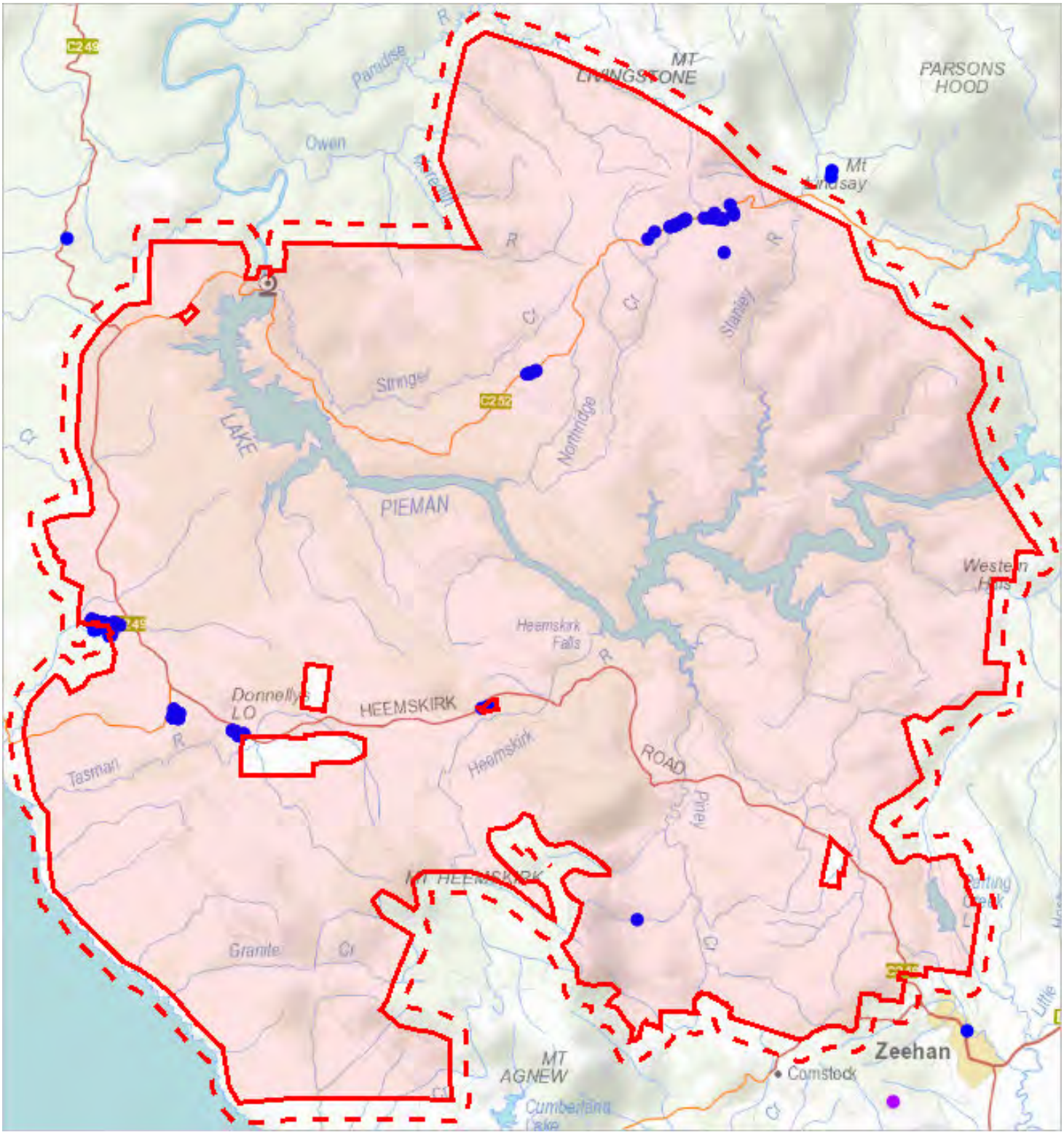
Reference:	Whaleback lease area
Requested For:	
Report Type:	Summary Report
Timestamp:	03:41:23 PM Thursday 11 May 2023
Threatened Flora:	buffers Min: 500m Max: 5000m
Threatened Fauna:	buffers Min: 500m Max: 5000m
Raptors:	buffers Min: 500m Max: 5000m
Tasmanian Weed Management Act Weeds:	buffers Min: 500m Max: 5000m
Priority Weeds:	buffers Min: 500m Max: 5000m
Geoconservation:	buffer 1000m
Acid Sulfate Soils:	buffer 1000m
TASVEG:	buffer 1000m
Threatened Communities:	buffer 1000m
Fire History:	buffer 1000m
Tasmanian Reserve Estate:	buffer 1000m
Biosecurity Risks:	buffer 1000m

The centroid for this query GDA94: 351239.0, 5371903.0 falls within:

Property: 3388311

Threatened flora within 500 metres

364427, 5386322



338427, 5358797

Please note that some layers may not display at all requested map scales

Threatened flora within 500 metres

Legend: Verified and Unverified observations

- Point Verified
- Point Unverified
- Line Verified
- Line Unverified
- Polygon Verified
- Polygon Unverified

Legend: Cadastral Parcels

Threatened flora within 500 metres

Verified Records

Species	Common Name	SS	NS	Bio	Observation Count	Last Recorded
Comesperma defoliatum	leafless milkwort	r		n	346	10-Feb-2016
Epacris curtisiae	northwest heath	r		e	42	28-Sep-2014
Orthoceras strictum	horned orchid	r		n	4	07-Feb-2021

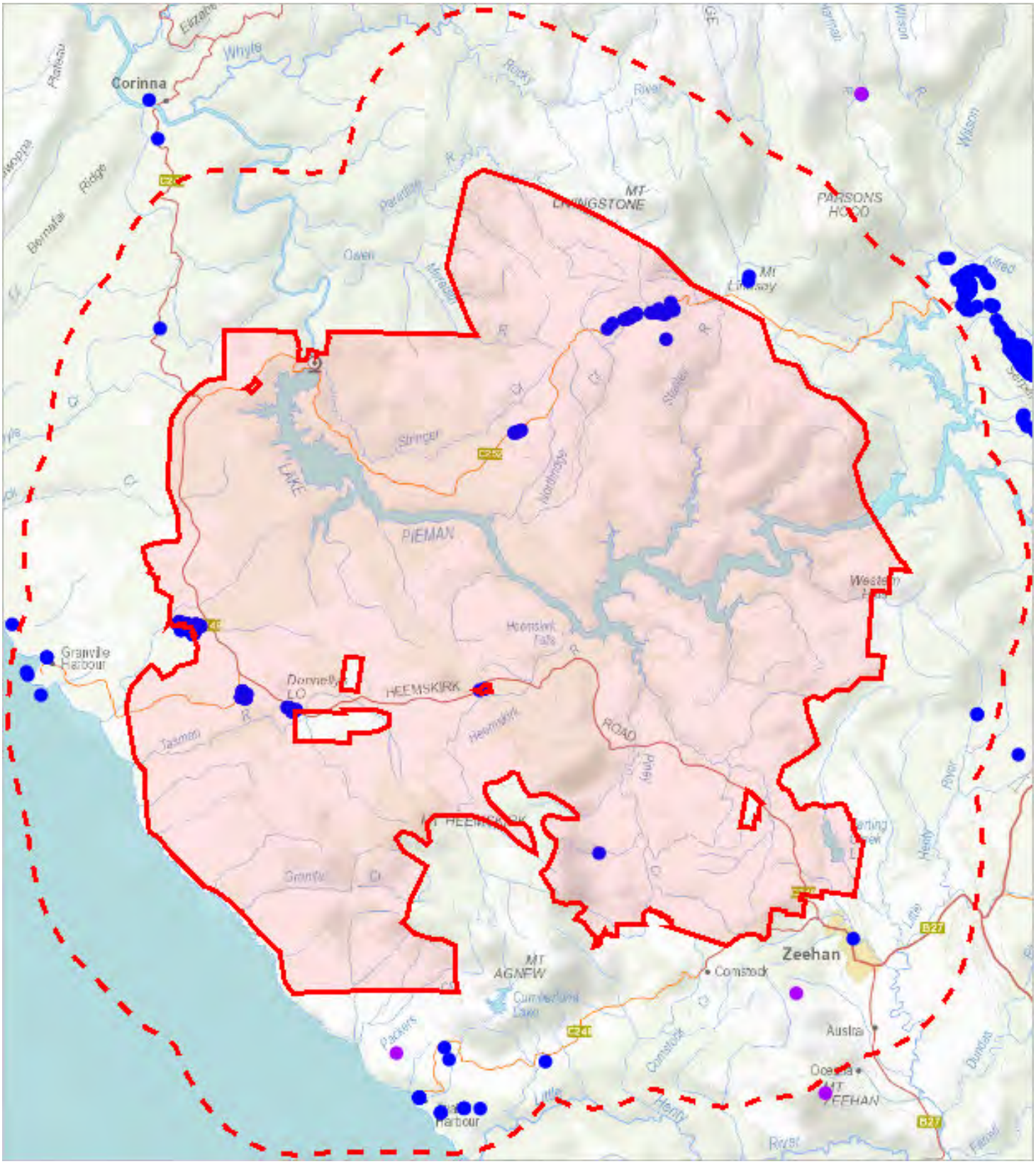
Unverified Records

No unverified records were found!

For more information about threatened species, please contact Threatened Species Enquiries.
Telephone: 1300 368 550
Email: ThreatenedSpecies.Enquiries@nre.tas.gov.au
Address: GPO Box 44, Hobart, Tasmania, Australia, 7000

Threatened flora within 5000 metres

367862, 5390874



334950, 5354226

Please note that some layers may not display at all requested map scales

Threatened flora within 5000 metres

Legend: Verified and Unverified observations

- Point Verified
- Point Unverified
- Line Verified
- Line Unverified
- Polygon Verified
- Polygon Unverified

Legend: Cadastral Parcels

Threatened flora within 5000 metres

Verified Records

Species	Common Name	SS	NS	Bio	Observation Count	Last Recorded
Amphibromus neesii	southern swampgrass	r		n	1	02-Dec-1981
Baumea gunnii	slender twigsedge	r		n	2	01-Apr-1894
Bolboschoenus caldwellii	sea clubsedge	r		n	1	03-Dec-1981
Bunodophoron notatum		e		t	1	06-Apr-1989
Carex gunniana	mountain sedge	r		n	1	01-Jan-1894
Comesperma defoliatum	leafless milkwort	r		n	346	10-Feb-2016
Cullen microcephalum	dusky scurfpea	r		n	2	12-Dec-1996
Deyeuxia minor	small bentgrass	r		n	1	02-Dec-1981
Epacris curtisiae	northwest heath	r		e	42	28-Sep-2014
Epacris glabella	smooth heath	e	EN	e	1	26-Sep-1986
Hypolepis muelleri x rugosula		ph		n	2	06-Jul-2011
Juncus prismatocarpus	branching rush	r		n	1	01-Aug-1893
Lotus australis	australian trefoil	r		n	4	26-Nov-2008
Micrantheum serpentinum	western tridentbush	r		e	10	28-Sep-2014
Orthoceras strictum	horned orchid	r		n	13	07-Feb-2021
Pomaderris intermedia	lemon dogwood	r		n	2	12-Jul-2011
Pseudocephalozia paludicola			VU	n	1	01-Jan-1980
Ranunculus acaulis	dune buttercup	r		t	1	02-Dec-1981
Veronica novae-hollandiae	coast speedwell	v		e	1	25-Nov-1945

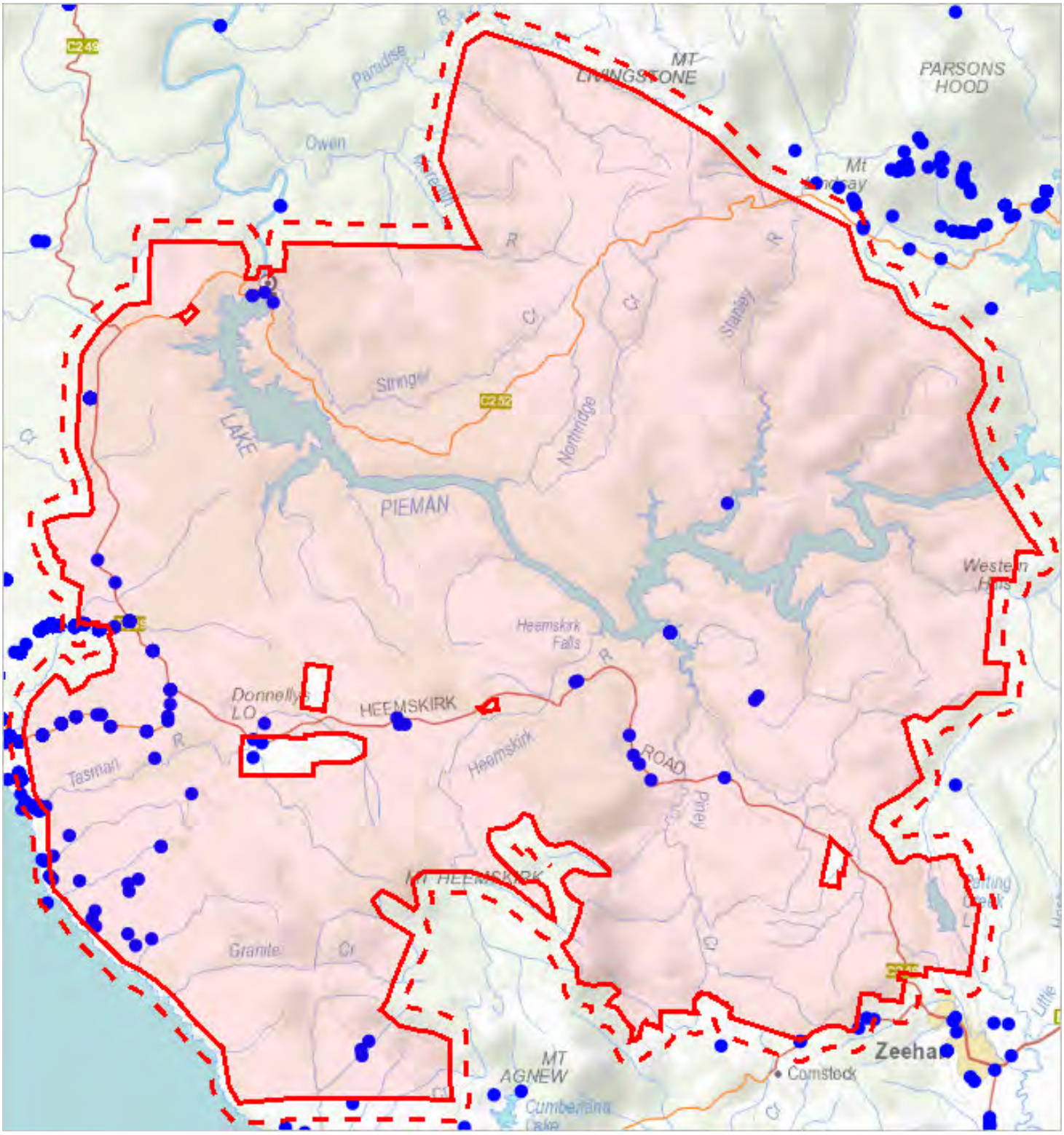
Unverified Records

Species	Common Name	SS	NS	Bio	Observation Count
Bunodophoron notatum		e		t	1
Orthoceras strictum	horned orchid	r		n	1

For more information about threatened species, please contact Threatened Species Enquiries.
Telephone: 1300 368 550
Email: ThreatenedSpecies.Enquiries@nre.tas.gov.au
Address: GPO Box 44, Hobart, Tasmania, Australia, 7000

Threatened fauna within 500 metres

364427, 5386322



338427, 5358797

Please note that some layers may not display at all requested map scales

Threatened fauna within 500 metres

Legend: Verified and Unverified observations

- Point Verified
- Point Unverified
- Line Verified
- Line Unverified
- Polygon Verified
- Polygon Unverified

Legend: Cadastral Parcels

Threatened fauna within 500 metres

Verified Records

Species	Common Name	SS	NS	Bio	Observation Count	Last Recorded
Accipiter novaehollandiae	grey goshawk	e		n	2	12-Jun-1979
Aquila audax	wedge-tailed eagle	pe	PEN	n	2	27-Jan-2017
Aquila audax subsp. fleayi	tasmanian wedge-tailed eagle	e	EN	e	19	25-Mar-2002
Charadrius rubricollis	hooded plover		PVU	n	6	20-Mar-2002
Dasyurus maculatus	spotted-tail quoll	r	VU	n	1	01-Jan-1970
Dasyurus maculatus subsp. maculatus	spotted-tail quoll	r	VU	n	4	20-Aug-2007
Diomedea cauta	shy albatross	pv	PVU		1	23-Feb-2002
Diomedea cauta subsp. cauta	shy albatross	pv	PVU		2	27-Aug-1979
Diomedea melanophrys subsp. melanophrys	black-browed albatross	pe	PVU		1	25-Mar-1980
Haliaeetus leucogaster	white-bellied sea-eagle	v		n	14	30-Jan-2010
Hirundapus caudacutus	white-throated needletail		VU	n	7	30-Jan-2010
Lathamus discolor	swift parrot	e	CR	mbe	1	13-Feb-1978
Limosa lapponica subsp. baueri	western alaskan bar-tailed godwit		VU	n	1	13-Feb-1978
Pachyptila turtur subantarctica	southern fairy prion	e	VU		1	05-Dec-1978
Prototroctes maraena	australian grayling	v	VU	ae	10	26-Nov-1987
Sarcophilus harrisii	tasmanian devil	e	EN	e	398	07-Oct-2022
Thinornis rubricollis	hooded plover		VU	n	3	05-Dec-1978

Unverified Records

No unverified records were found!

Threatened fauna within 500 metres

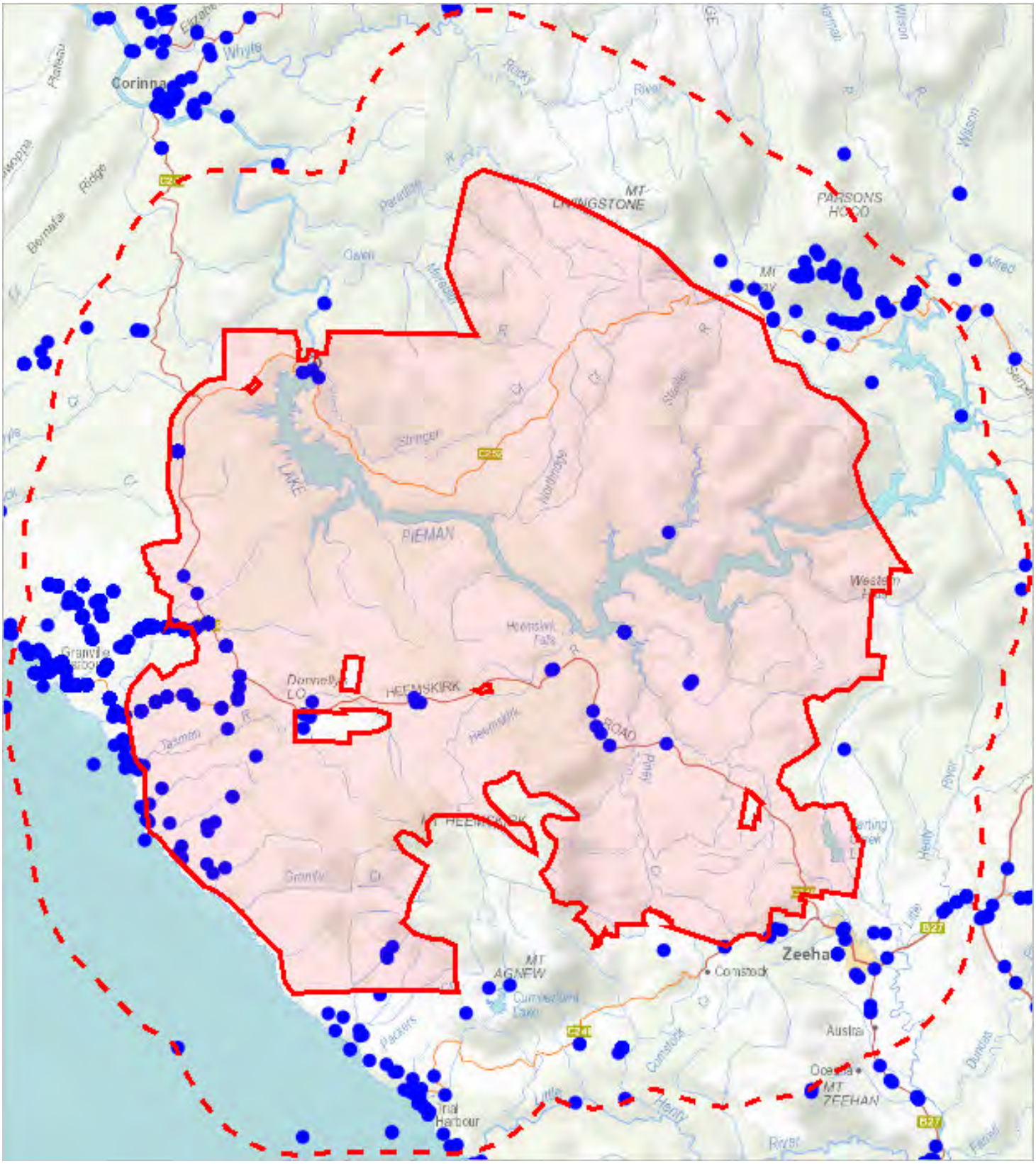
(based on Range Boundaries)

Species	Common Name	SS	NS	BO	Potential	Known	Core
Litoria raniformis	green and gold frog	v	VU	n	1	0	0
Lathamus discolor	swift parrot	e	CR	mbe	1	0	0
Dasyurus maculatus subsp. maculatus	spotted-tail quoll	r	VU	n	1	0	0
Prototroctes maraena	australian grayling	v	VU	ae	56	0	0
Beddomeia bowryensis	Bowry Creek freshwater snail	r		eH	0	1	0
Ceyx azureus subsp. diemenensis	Tasmanian azure kingfisher	e	EN	e	0	0	1
Pseudemoia pagenstecheri	tussock skink	v		n	1	0	0
Haliaeetus leucogaster	white-bellied sea-eagle	v		n	5	0	0
Limnodynastes peroni	striped marsh frog	e		n	1	0	0
Tyto novaehollandiae subsp. castanops	masked owl (Tasmanian)	e	VU	e	1	0	1
Accipiter novaehollandiae	grey goshawk	e		n	1	0	1
Sarcophilus harrisii	tasmanian devil	e	EN	e	1	0	0
Aquila audax subsp. fleayi	tasmanian wedge-tailed eagle	e	EN	e	1	0	0

For more information about threatened species, please contact Threatened Species Enquiries.
Telephone: 1300 368 550
Email: ThreatenedSpecies.Enquiries@nre.tas.gov.au
Address: GPO Box 44, Hobart, Tasmania, Australia, 7000

Threatened fauna within 5000 metres

367862, 5390874



334950, 5354226

Please note that some layers may not display at all requested map scales

Threatened fauna within 5000 metres

Legend: Verified and Unverified observations

- Point Verified
- Point Unverified
- Line Verified
- Line Unverified
- Polygon Verified
- Polygon Unverified

Legend: Cadastral Parcels

Threatened fauna within 5000 metres

Verified Records

Species	Common Name	SS	NS	Bio	Observation Count	Last Recorded
Acanthornis magna subsp. greeniana	King Island scrubtit	e	CR	eH	2	30-Oct-1898
Accipiter novaehollandiae	grey goshawk	e		n	3	11-Oct-2012
Aquila audax	wedge-tailed eagle	pe	PEN	n	8	09-Sep-2019
Aquila audax subsp. fleayi	tasmanian wedge-tailed eagle	e	EN	e	32	16-Jun-2009
Arctocephalus forsteri subsp. doriferus	new zealand fur seal	r		n	1	02-Jan-2007
Beddomeia bowryensis	Bowry Creek freshwater snail	r		eH	1	13-Feb-1989
Beddomeia zeehanensis	Zeehan freshwater snail	r		eH	3	17-Feb-2007
Charadrius rubricollis	hooded plover		PVU	n	10	20-Mar-2002
Dasyurus maculatus	spotted-tail quoll	r	VU	n	5	01-Mar-2019
Dasyurus maculatus subsp. maculatus	spotted-tail quoll	r	VU	n	14	07-Jul-2011
Dasyurus viverrinus	eastern quoll		EN	n	3	01-Mar-1984
Diomedea cauta	shy albatross	pv	PVU		1	23-Feb-2002
Diomedea cauta subsp. cauta	shy albatross	pv	PVU		2	27-Aug-1979
Diomedea melanophrys subsp. melanophrys	black-browed albatross	pe	PVU		1	25-Mar-1980
Eubalaena australis	southern right whale	e	EN	m	2	08-May-2008
Haliaeetus leucogaster	white-bellied sea-eagle	v		n	38	21-Apr-2019
Halobaena caerulea	blue petrel	v	VU	n	1	03-Dec-1978
Hirundapus caudacutus	white-throated needletail		VU	n	9	30-Jan-2010
Lathamus discolor	swift parrot	e	CR	mbe	1	13-Feb-1978
Limosa lapponica subsp. baueri	western alaskan bar-tailed godwit		VU	n	1	13-Feb-1978
Megaptera novaeangliae	humpback whale	e		m	1	24-Dec-1993
Mirounga leonina subsp. macquariensis	southern elephant seal	pe	PVU	n	3	23-Jul-2010
Neophema chrysogaster	orange-bellied parrot	e	CR	mbe	6	18-Mar-2002
Pachyptila turtur subantarctica	southern fairy prion	e	VU		4	05-Dec-1978
Phrantela conica	Little Henty River hydrobiid snail	r		eH	3	31-Dec-2013
Prototroctes maraena	australian grayling	v	VU	ae	10	26-Nov-1987
Sarcophilus harrisii	tasmanian devil	e	EN	e	1520	07-Oct-2022
Sterna nereis subsp. nereis	fairy tern	pv	PVU		1	01-Jan-1900
Sternula nereis subsp. nereis	fairy tern	v	VU	n	2	01-Jan-1900
Thinornis cucullatus	hooded plover		PVU	ae	4	21-Apr-2019
Thinornis rubricollis	hooded plover		VU	n	9	01-Jan-1992
Thylacinus cynocephalus	thylacine	x	EX	ex	3	11-Apr-1975
Tyto novaehollandiae subsp. castanops	masked owl (Tasmanian)	e	VU	e	46	26-Dec-2022

Unverified Records

No unverified records were found!

Threatened fauna within 5000 metres

(based on Range Boundaries)

Species	Common Name	SS	NS	BO	Potential	Known	Core
Litoria raniformis	green and gold frog	v	VU	n	1	0	0
Lathamus discolor	swift parrot	e	CR	mbe	1	0	0
Dasyurus maculatus subsp. maculatus	spotted-tail quoll	r	VU	n	1	0	0
Prototroctes maraena	australian grayling	v	VU	ae	119	0	0
Beddomeia bowryensis	Bowry Creek freshwater snail	r		eH	0	1	0
Ceyx azureus subsp. diemenensis	Tasmanian azure kingfisher	e	EN	e	0	0	1
Pseudemoia pagenstecheri	tussock skink	v		n	1	0	0
Haliaeetus leucogaster	white-bellied sea-eagle	v		n	5	0	0
Limnodynastes peroni	striped marsh frog	e		n	1	0	0
Tyto novaehollandiae subsp. castanops	masked owl (Tasmanian)	e	VU	e	1	0	1
Beddomeia zeehanensis	Zeehan freshwater snail	r		eH	1	1	0
Accipiter novaehollandiae	grey goshawk	e		n	1	0	1
Phrantela conica	Little Henty River hydrobiid snail	r		eH	1	1	0
Sarcophilus harrisii	tasmanian devil	e	EN	e	1	0	0
Aquila audax subsp. fleayi	tasmanian wedge-tailed eagle	e	EN	e	1	0	0

For more information about threatened species, please contact Threatened Species Enquiries.
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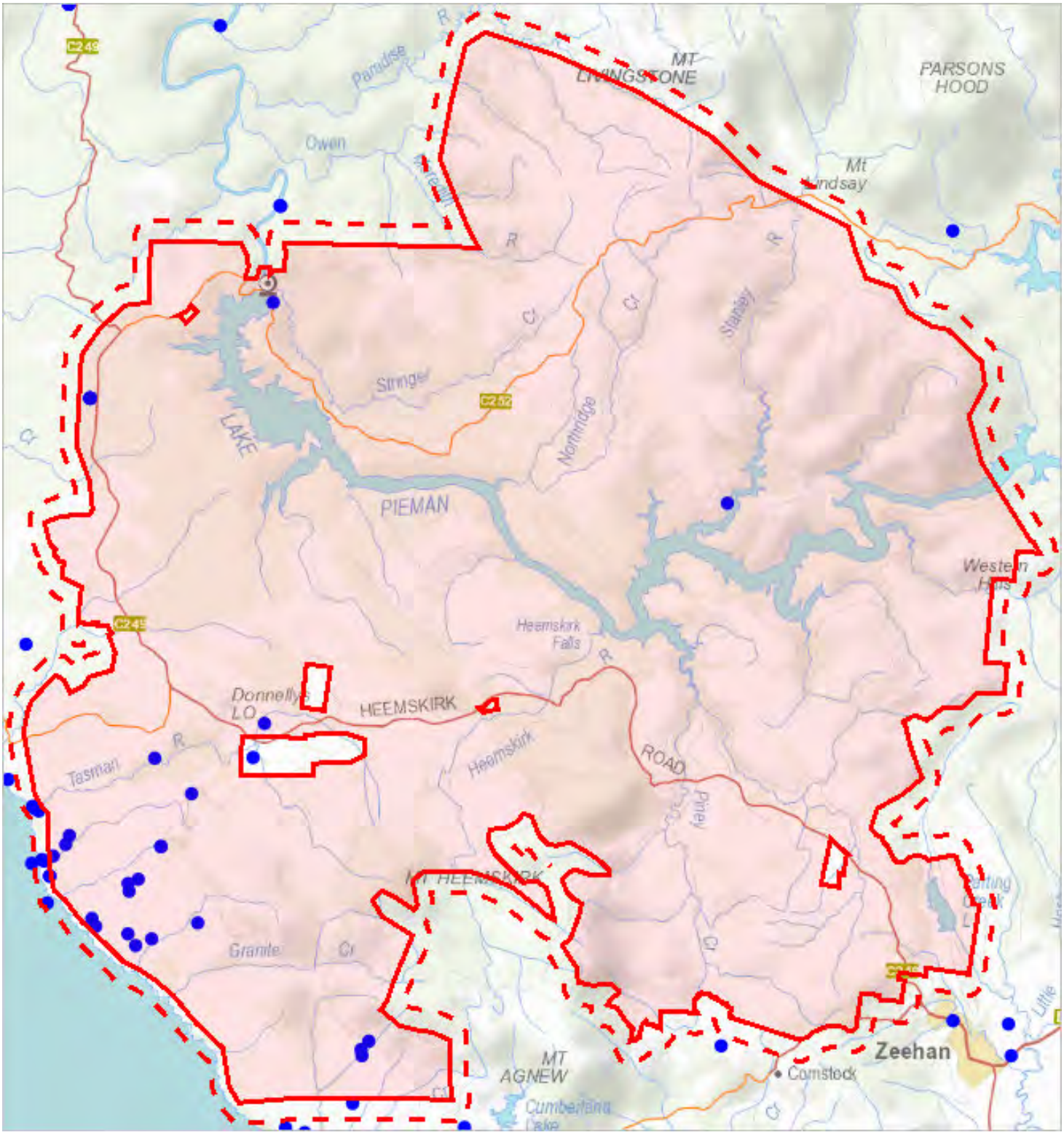
Email: ThreatenedSpecies.Enquiries@nre.tas.gov.au
Address: GPO Box 44, Hobart, Tasmania, Australia, 7000

Threatened fauna within 5000 metres

Raptor nests and sightings within 500 metres

364427, 5386322



338427, 5358797

Please note that some layers may not display at all requested map scales

Raptor nests and sightings within 500 metres

Legend: Verified and Unverified observations

- Point Verified
- Point Unverified
- Line Verified
- Line Unverified
- Polygon Verified
- Polygon Unverified

Legend: Cadastral Parcels

Raptor nests and sightings within 500 metres

Verified Records

Nest Id/Location Foreign Id	Species	Common Name	Obs Type	Observation Count	Last Recorded
714	Aquila audax subsp. fleayi	tasmanian wedge-tailed eagle	Nest	1	12-Jun-1997
	Accipiter novaehollandiae	grey goshawk	Sighting	2	12-Jun-1979
	Aquila audax	wedge-tailed eagle	Not Recorded	1	27-Jan-2017
	Aquila audax	wedge-tailed eagle	Sighting	1	04-Aug-1999
	Aquila audax subsp. fleayi	tasmanian wedge-tailed eagle	Sighting	18	25-Mar-2002
	Falco cenchroides	nankeen kestrel	Not Recorded	1	01-Jan-1900
	Falco peregrinus	peregrine falcon	Sighting	2	10-Dec-2001
	Haliaeetus leucogaster	white-bellied sea-eagle	Not Recorded	2	30-Jan-2010
	Haliaeetus leucogaster	white-bellied sea-eagle	Sighting	12	20-Mar-2002

Unverified Records

No unverified records were found!

Raptor nests and sightings within 500 metres

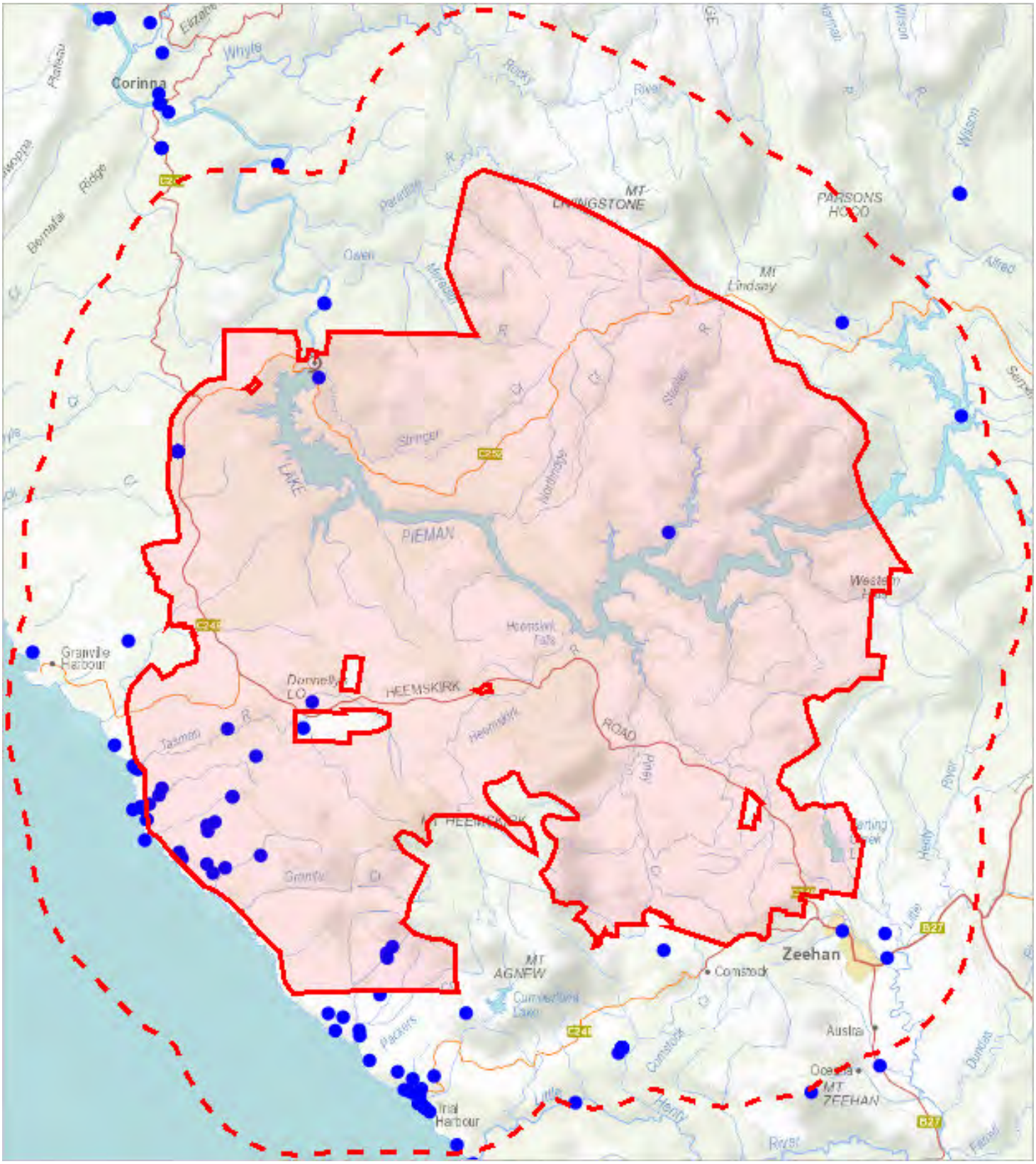
(based on Range Boundaries)

Species	Common Name	SS	NS	Potential	Known	Core
Aquila audax subsp. fleayi	tasmanian wedge-tailed eagle	e	EN	1	0	0
Accipiter novaehollandiae	grey goshawk	e		1	0	1
Haliaeetus leucogaster	white-bellied sea-eagle	v		5	0	0

For more information about raptor nests, please contact Threatened Species Enquiries.
Telephone: 1300 368 550
Email: ThreatenedSpecies.Enquiries@nre.tas.gov.au
Address: GPO Box 44, Hobart, Tasmania, Australia, 7000

Raptor nests and sightings within 5000 metres

367862, 5390874



334950, 5354226

Please note that some layers may not display at all requested map scales

Raptor nests and sightings within 5000 metres

Legend: Verified and Unverified observations

- Point Verified
- Point Unverified
- Line Verified
- Line Unverified
- Polygon Verified
- Polygon Unverified

Legend: Cadastral Parcels

Raptor nests and sightings within 5000 metres

Verified Records

Nest Id/Location Foreign Id	Species	Common Name	Obs Type	Observation Count	Last Recorded
1771	Aquila audax subsp. fleayi	tasmanian wedge-tailed eagle	Nest	1	16-Jun-2009
1809	Aquila audax subsp. fleayi	tasmanian wedge-tailed eagle	Nest	1	15-Jun-2009
663	Haliaeetus leucogaster	white-bellied sea-eagle	Nest	1	01-Jan-1985
714	Aquila audax subsp. fleayi	tasmanian wedge-tailed eagle	Nest	1	12-Jun-1997
	Accipiter novaehollandiae	grey goshawk	Audible	1	11-Oct-2012
	Accipiter novaehollandiae	grey goshawk	Sighting	2	12-Jun-1979
	Aquila audax	wedge-tailed eagle	Not Recorded	3	27-Jan-2017
	Aquila audax	wedge-tailed eagle	Sighting	5	09-Sep-2019
	Aquila audax subsp. fleayi	tasmanian wedge-tailed eagle	Sighting	29	05-Apr-2002
	Falco cenchroides	nankeen kestrel	Not Recorded	1	01-Jan-1900
	Falco peregrinus	peregrine falcon	Sighting	2	10-Dec-2001
	Haliaeetus leucogaster	white-bellied sea-eagle	Not Recorded	3	12-Mar-2018
	Haliaeetus leucogaster	white-bellied sea-eagle	Sighting	34	21-Apr-2019

Unverified Records

No unverified records were found!

Raptor nests and sightings within 5000 metres

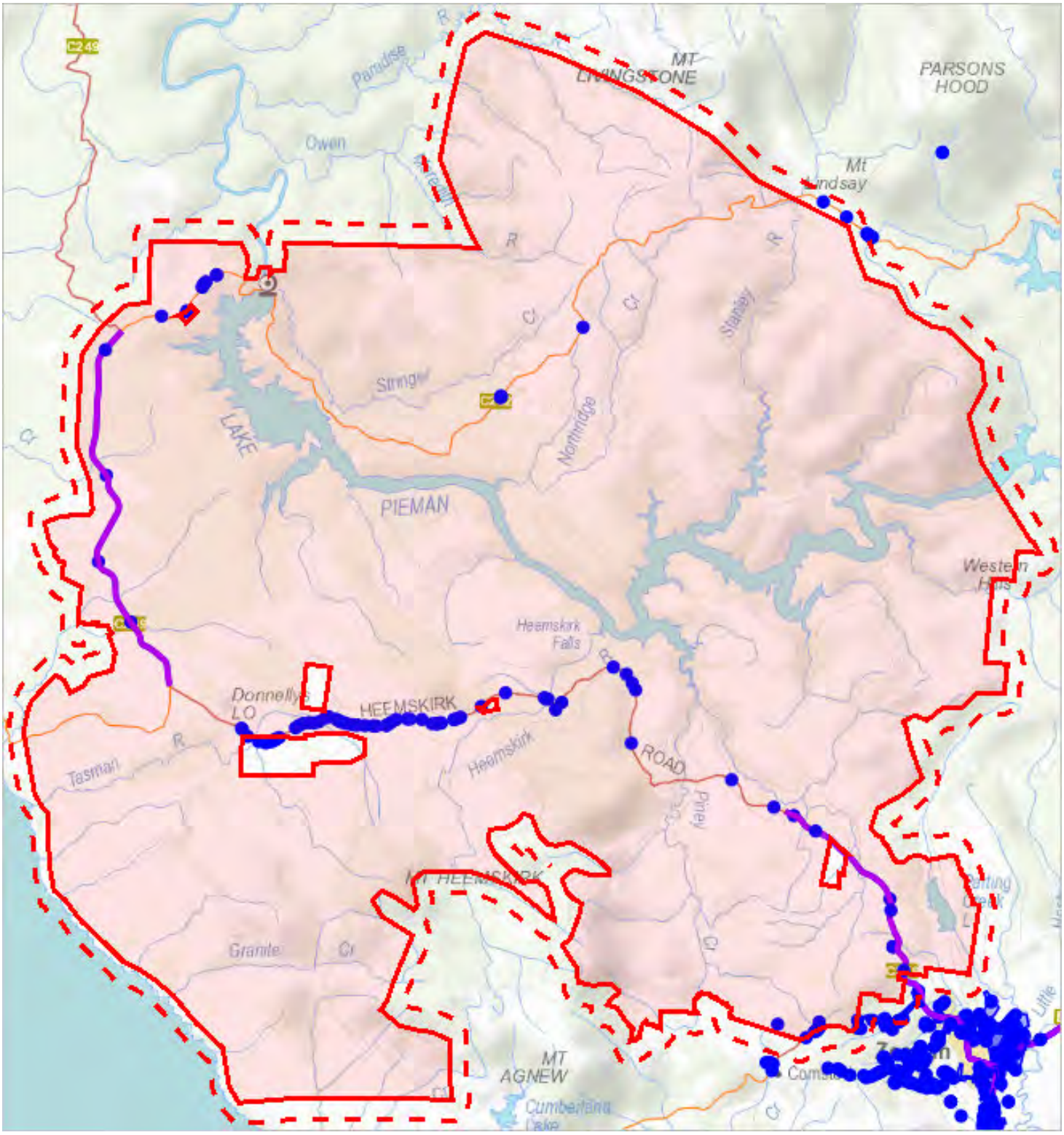
(based on Range Boundaries)

Species	Common Name	SS	NS	Potential	Known	Core
Aquila audax subsp. fleayi	tasmanian wedge-tailed eagle	e	EN	1	0	0
Accipiter novaehollandiae	grey goshawk	e		1	0	1
Haliaeetus leucogaster	white-bellied sea-eagle	v		5	0	0

For more information about raptor nests, please contact Threatened Species Enquiries.
Telephone: 1300 368 550
Email: ThreatenedSpecies.Enquiries@nre.tas.gov.au
Address: GPO Box 44, Hobart, Tasmania, Australia, 7000

Tas Management Act Weeds within 500 m

364427, 5386322



338427, 5358797

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Tas Management Act Weeds within 500 m

Legend: Verified and Unverified observations

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- Line Unverified
- Polygon Verified
- Polygon Unverified

Legend: Cadastral Parcels

Tas Management Act Weeds within 500 m

Verified Records

Species	Common Name	Observation Count	Last Recorded
Austroderia richardii	toe-toe pampasgrass	8	27-Jan-2010
Cortaderia selloana	silver pampasgrass	2	21-Mar-2016
Cortaderia sp.	pampas grass	1	05-May-2009
Cytisus scoparius	english broom	2	14-Aug-2007
Datura ferox	longspine thornapple	1	22-May-1981
Erica lusitanica	spanish heath	83	27-Feb-2009
Genista monspessulana	montpellier broom or canary broom	1	05-Dec-2012
Ilex aquifolium	holly	1	14-Sep-2004
Ulex europaeus	gorse	27	05-Dec-2012

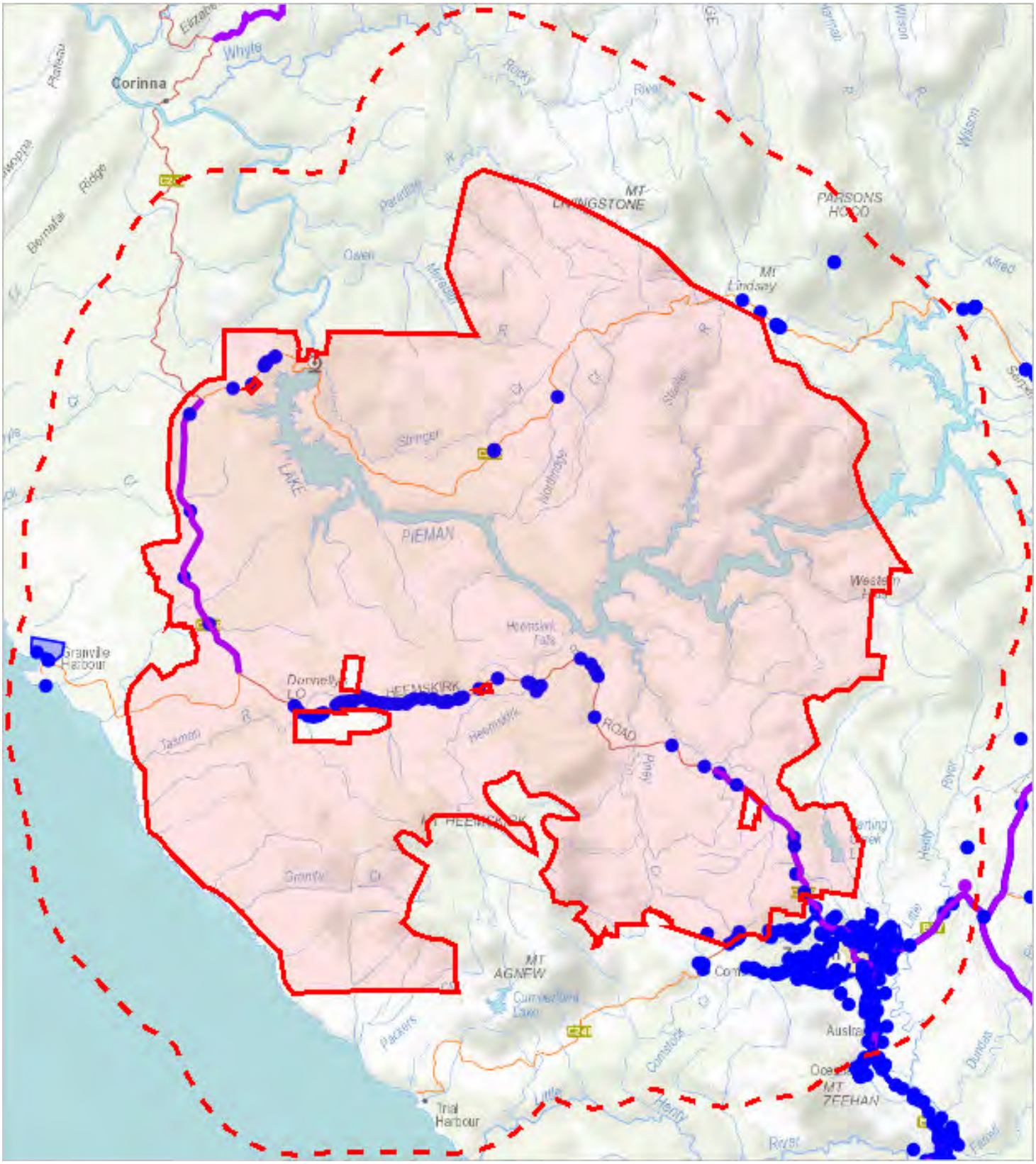
Unverified Records

For more information about introduced weed species, please visit the following URL for contact details in your area:

https://www.nre.tas.gov.au/invasive-species/weeds

Tas Management Act Weeds within 5000 m

367862, 5390874



334950, 5354226

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Tas Management Act Weeds within 5000 m

Legend: Verified and Unverified observations

- Point Verified
- Point Unverified
- Line Verified
- Line Unverified
- Polygon Verified
- Polygon Unverified

Legend: Cadastral Parcels

Tas Management Act Weeds within 5000 m

Verified Records

Species	Common Name	Observation Count	Last Recorded
Austroderia richardii	toe-toe pampasgrass	61	16-Feb-2010
Cortaderia selloana	silver pampasgrass	3	21-Mar-2016
Cortaderia sp.	pampas grass	8	14-Aug-2015
Cytisus scoparius	english broom	47	07-Nov-2021
Datura ferox	longspine thornapple	1	22-May-1981
Erica lusitanica	spanish heath	104	05-Oct-2014
Genista monspessulana	montpellier broom or canary broom	2	05-Dec-2012
Ilex aquifolium	holly	5	05-Mar-2009
Leycesteria formosa	himalayan honeysuckle	2	26-May-2009
Rubus fruticosus	blackberry	10	01-Feb-2010
Senecio jacobaea	ragwort	2	16-Feb-2010
Ulex europaeus	gorse	272	13-Feb-2022

Unverified Records

Species	Common Name	Observation Count
Austroderia richardii	toe-toe pampasgrass	1

For more information about introduced weed species, please visit the following URL for contact details in your area:

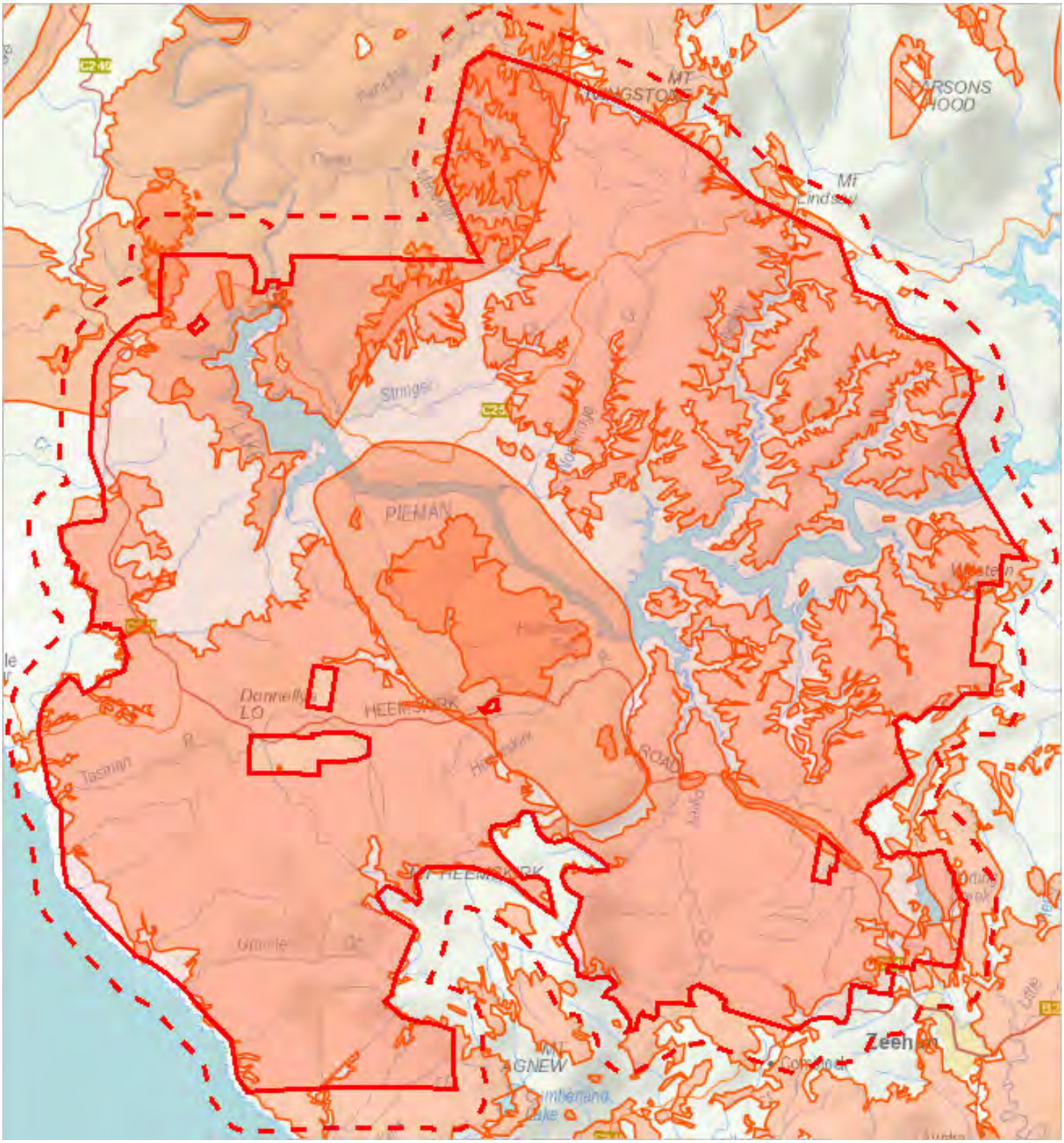
https://www.nre.tas.gov.au/invasive-species/weeds

*** No Priority Weeds found within 500 metres ***

*** No Priority Weeds found within 5000 metres ***

Geoconservation sites within 1000 metres

364809, 5386828



338040, 5358289

Please note that some layers may not display at all requested map scales

Geoconservation sites within 1000 metres

Legend: Geoconservation (NVA)

Legend: Cadastral Parcels

Geoconservation sites within 1000 metres

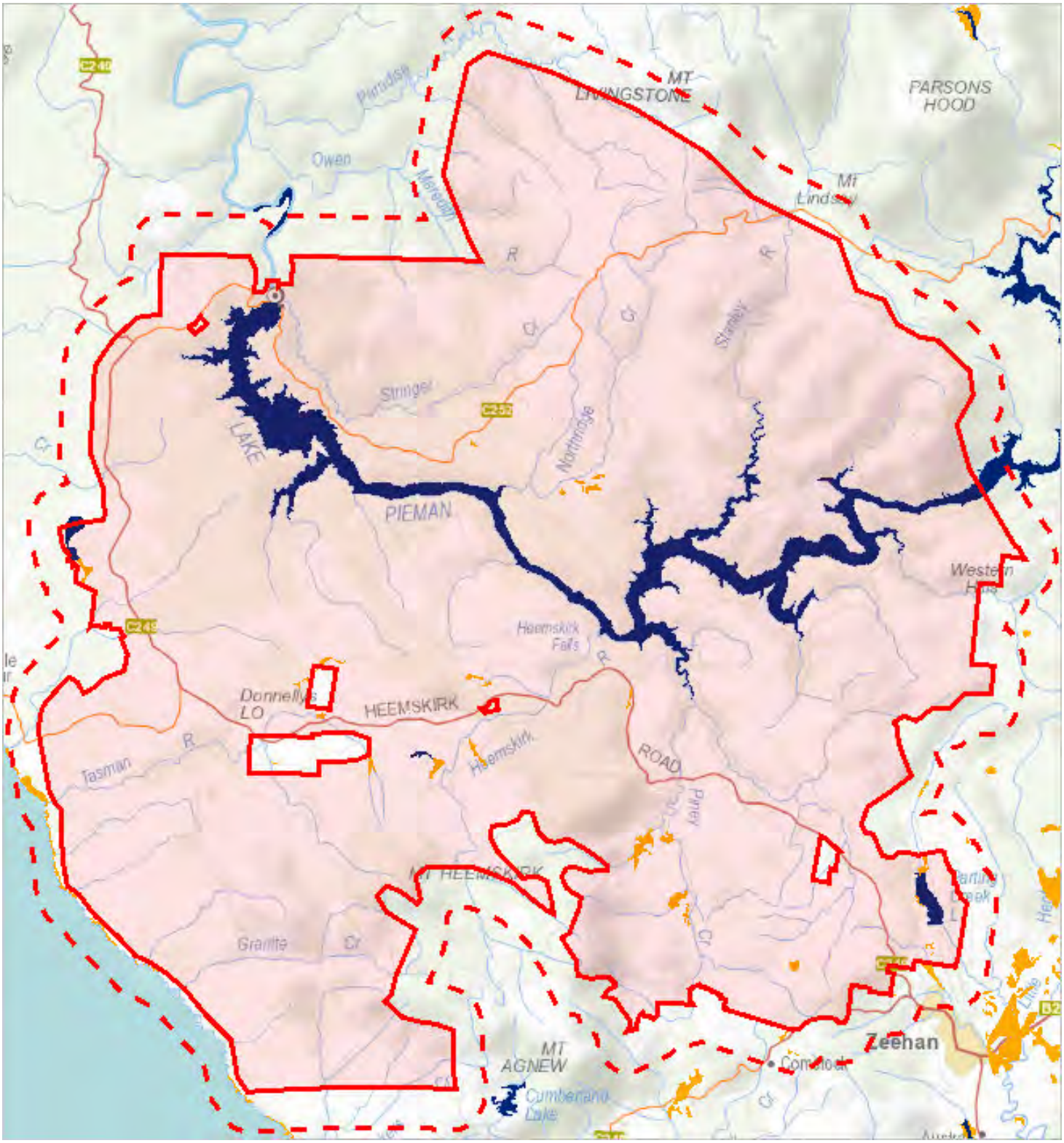
Id	Name	Statement of Significance	Significance Level	Status
2837	Arthur Lineament	The Arthur Lineament forms the western limit to Tyennan Orogeny allochthonous blocks in Tasmania and appears to mark the maximum extent of the thrust complex. Rocks of the Lineament provide key evidence for tectonic and metamorphic process during the early stages of the Cambrian Tyennan Orogeny. It represents a major crustal suture broadly correlated with the Delermarian Orogeny of mainland Australia.	National	Listed
3173	Cenozoic Plant Macrofossils of Tasmania	Tasmania contains a rich assemblage of Cenozoic plant macrofossils, many in an excellent state of preservation. Collectively, the fossil sites allow reconstruction of the character, evolution and palaeoenvironmental context of the southern hemisphere temperate palaeoflora of Tasmania across ca. 60 million years. The fossil record is crucial to our understanding of Tasmania's distinctive modern flora, especially conifers.	Global	Listed
2838	Eureka Dolerite Cone Sheet	Notable example of type.	State	Listed
3211	Granville Harbour Early Eocene Plant Fossil Site	This is an Early Eocene plant macrofossil site near Granville Habour on the west coast of Tasmania. It preserves evidence that contributes to our understanding of the character, evolution and palaeoenvironmental context of Tasmania's Cenozoic flora.	District	Listed
2839	Piney Creek Structural Deformation of Oonah Formation	Notable example of type.	District	Listed
3299	Reece Dam Area Blue Amphibole of the Arthur Metamorphic Complex	The blue amphibole minerals are a rare relict phase in the predominantly retrograde greenschist facies Bowry Formation. The high pressure but low temperature metamorphic conditions of their formation indicate rapid tectonic burial and exhumation. This provides significant insight into the evolution of the Arthur Metamorphic Complex and the mechanics of stage 1 of the Tyennan Orogeny involving arc – continent collision and allochthon emplacement in the Early Middle Cambrian. Types of significance: Rarity: state level, confidence: moderate. Key site: state level, confidence: high. Representative reference: state level, confidence: high.	State	Listed
2840	Reece Spillway - Whyte Schists	Exposures in the vicinity of the Reece Dam spillway are considered critical to understanding of structures on the eastern margin of the Arthur Lineament.	State	Listed
2527	Western Tasmania Blanket Bogs	The most extensive organosol terrain in Australia and the Southern Hemisphere.	Global	Listed
2847	Zeehan Tillite Structures	These rocks provide unique evidence for a Carboniferous or later compressive tectonic event.	State	Listed

For more information about the Geoconservation Database, please visit the website: https://www.nre.tas.gov.au/conservation/geoconservation or contact the Geoconservation Officer:

Telephone: (03) 6165 4401
Email: Geoconservation.Enquiries@nre.tas.gov.au
Address: GPO Box 44, Hobart, Tasmania, Australia, 7000

Acid Sulfate Soils within 1000 metres

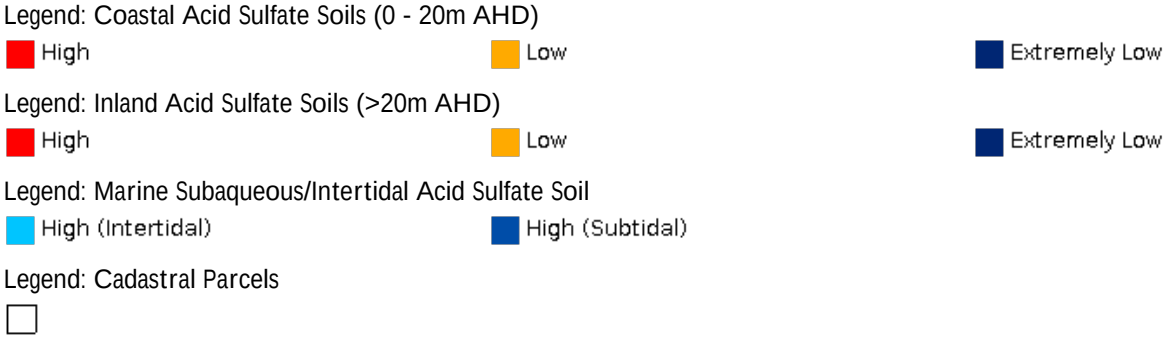
364809, 5386828



338040, 5358289

Please note that some layers may not display at all requested map scales

Acid Sulfate Soils within 1000 metres



Acid Sulfate Soils within 1000 metres

Dataset Name	Acid Sulfate Soil Probability	Acid Sulfate Soil Atlas	Description
Coastal Acid Sulfate Soils	Extremely Low	Ci(p2)	Extremely low probability of occurance (1-5% of mapping unit). with occurences in small areas. Sandplains and dunes 2-10m AHD, ASS generally below 1m from the surface. Heath, forests. Holocene or Pleistocene. Potential acid sulfate soil (PASS) = sulfidic material (Isbell 1996 p.122). Analytical data are incomplete but are sufficient to classify the soil with a reasonable degree of confidence.
Coastal Acid Sulfate Soils	Extremely Low	Cj(p3)	Extremely low probability of occurance (1-5% of mapping unit). with occurences in small areas. Sandplains and dunes >10m AHD, ASS generally below 1m from the surface. Heath, forests. Mainly Pleistocene. Potential acid sulfate soil (PASS) = sulfidic material (Isbell 1996 p.122). No necessary analytical data are available but confidence is fair, based on a knowledge of similar soils in similar environments.
Coastal Acid Sulfate Soils	Low	Bh(p3)	Low probability of occurance (6-70% chance of occurrence in mapping unit). Sandplains and dunes <2m AHD, ASS generally within 1m of the surface. Often wet heath. Holocene or Pleistocene. Potential acid sulfate soil (PASS) = sulfidic material (Isbell 1996 p.122). No necessary analytical data are available but confidence is fair, based on a knowledge of similar soils in similar environments.
Coastal Acid Sulfate Soils	Low	Bi(p3)	Low probability of occurance (6-70% chance of occurrence in mapping unit). Sandplains and dunes 2-10m AHD, ASS generally below 1m from the surface. Heath, forests. Holocene or Pleistocene. Potential acid sulfate soil (PASS) = sulfidic material (Isbell 1996 p.122). No necessary analytical data are available but confidence is fair, based on a knowledge of similar soils in similar environments.
Coastal Acid Sulfate Soils	Low	Bj(p3)	Low probability of occurance (6-70% chance of occurrence in mapping unit). Sandplains and dunes >10m AHD, ASS generally below 1m from the surface. Heath, forests. Mainly Pleistocene. Potential acid sulfate soil (PASS) = sulfidic material (Isbell 1996 p.122). No necessary analytical data are available but confidence is fair, based on a knowledge of similar soils in similar environments.
Coastal Acid Sulfate Soils	Low	Bu(p3)	Low probability of occurance (6-70% chance of occurrence in mapping unit). Unclassified - Insufficient landscape information available to classify map unit. Potential acid sulfate soil (PASS) = sulfidic material (Isbell 1996 p.122). No necessary analytical data are available but confidence is fair, based on a knowledge of similar soils in similar environments.
Inland Acid Sulfate Soils	Extremely Low	Ck(p4)	Extremely low probability of occurance (1-5% of mapping unit). with occurences in small areas. Subaqueous material in lakes, ASS material and/or MBO. Potential acid sulfate soil (PASS) = sulfidic material (Isbell 1996 p.122). No necessary analytical data are available and classifier has little knowledge or experience with ASS, hence classification is provisional.
Inland Acid Sulfate Soils	Extremely Low	Cl(p4)	Extremely low probability of occurance (1-5% of mapping unit). with occurences in small areas. Organosols, ASS generally within upper 1m in wet/riparian areas with Organosols (Isbell 1996). Potential acid sulfate soil (PASS) = sulfidic material (Isbell 1996 p.122). No necessary analytical data are available and classifier has little knowledge or experience with ASS, hence classification is provisional.
Inland Acid Sulfate Soils	Extremely Low	Cm(p4)	Extremely low probability of occurance (1-5% of mapping unit). with occurences in small areas. Hydrosols, ASS generally within upper 1m in wet/riparian areas with Hydrosols (Isbell 1996). Potential acid sulfate soil (PASS) = sulfidic material (Isbell 1996 p.122). No necessary analytical data are available and classifier has little knowledge or experience with ASS, hence classification is provisional.
Inland Acid Sulfate Soils	Low	Bl(p4)	Low probability of occurance (6-70% chance of occurrence in mapping unit). Organosols, ASS generally within upper 1m in wet/riparian areas with Organosols (Isbell 1996). Potential acid sulfate soil (PASS) = sulfidic material (Isbell 1996 p.122). No necessary analytical data are available and classifier has little knowledge or experience with ASS, hence classification is provisional.
Inland Acid Sulfate Soils	Low	Bm(p4)	Low probability of occurance (6-70% chance of occurrence in mapping unit). Hydrosols, ASS generally within upper 1m in wet/riparian areas with Hydrosols (Isbell 1996). Potential acid sulfate soil (PASS) = sulfidic material (Isbell 1996 p.122). No necessary analytical data are available and classifier has little knowledge or experience with ASS, hence classification is provisional.

For more information about Acid Sulfate Soils, please contact Land Management Enquiries.

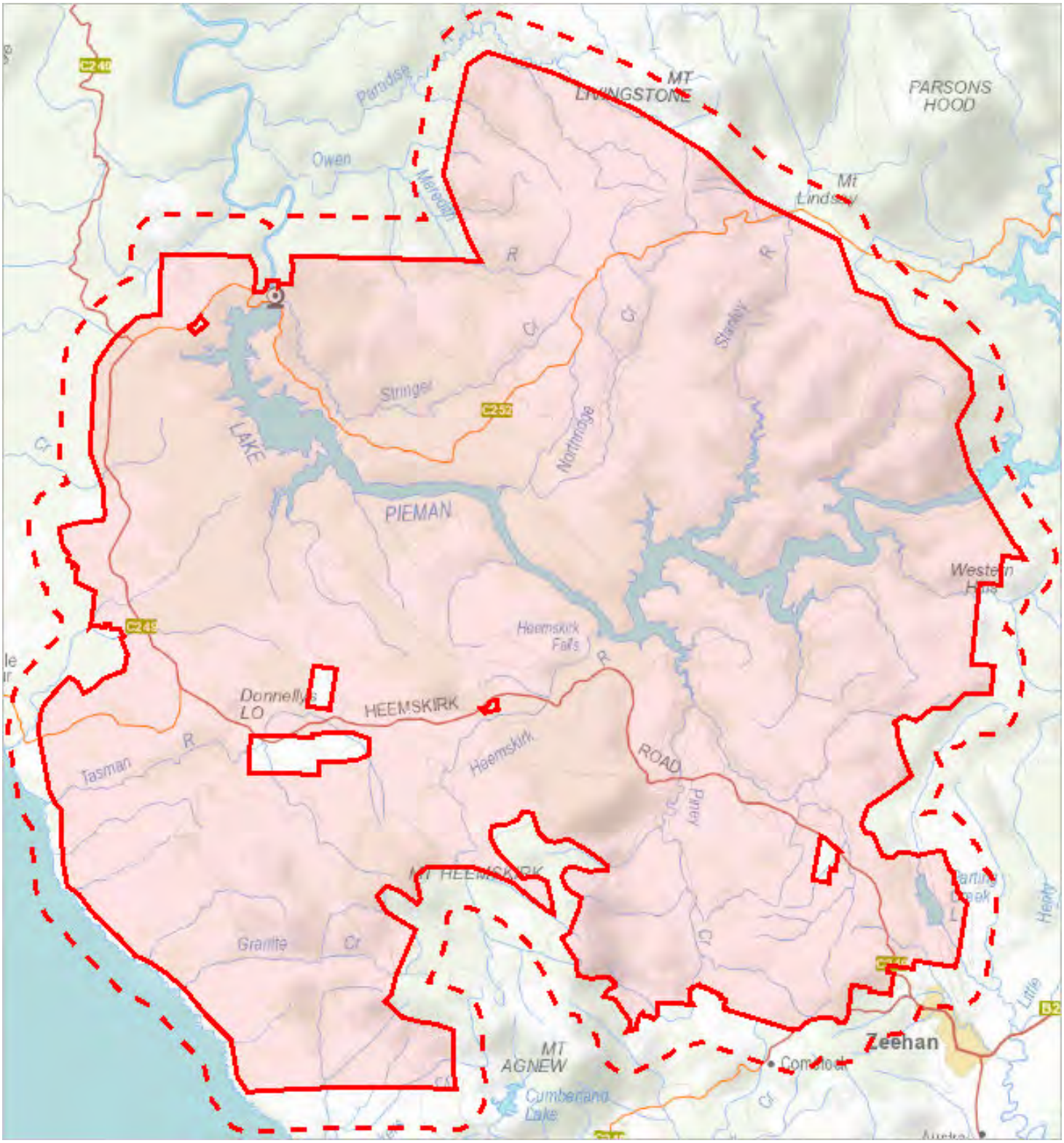
Telephone: (03) 6777 2227

Email: LandManagement.Enquiries@nre.tas.gov.au

Address: 171 Westbury Road, Prospect, Tasmania, Australia, 7250

TASVEG 4.0 Communities within 1000 metres

364809, 5386828



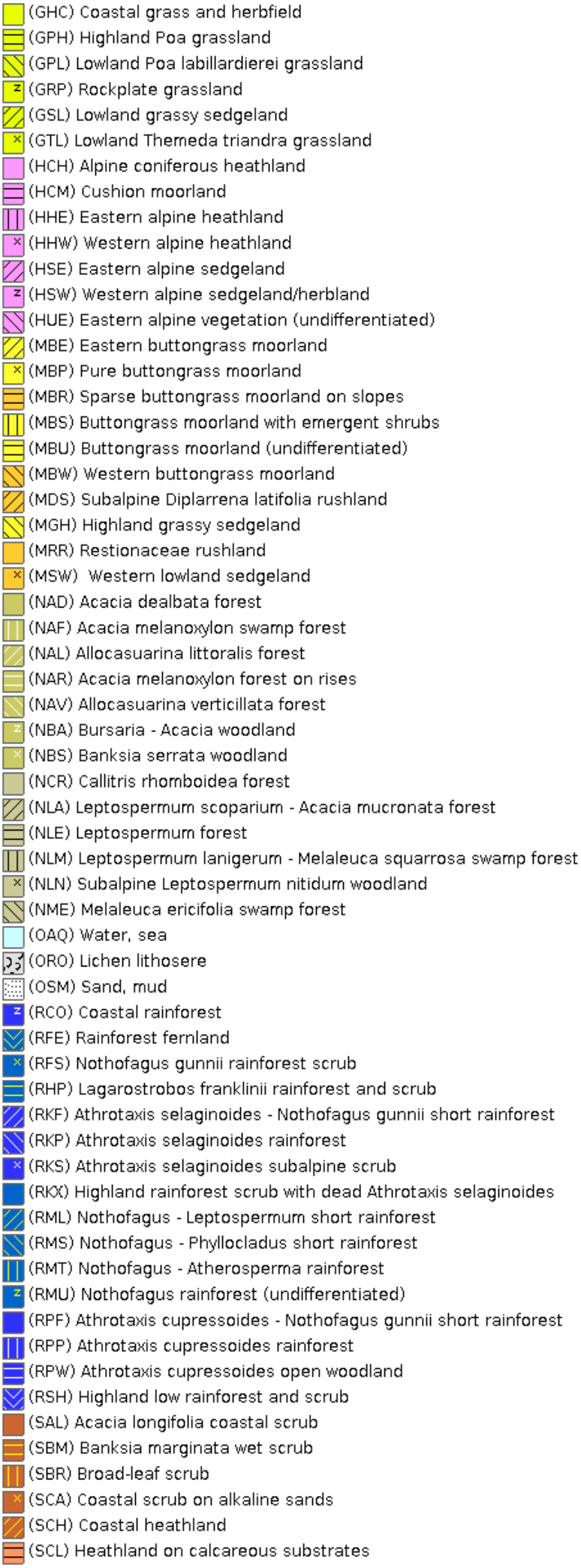
338040, 5358289

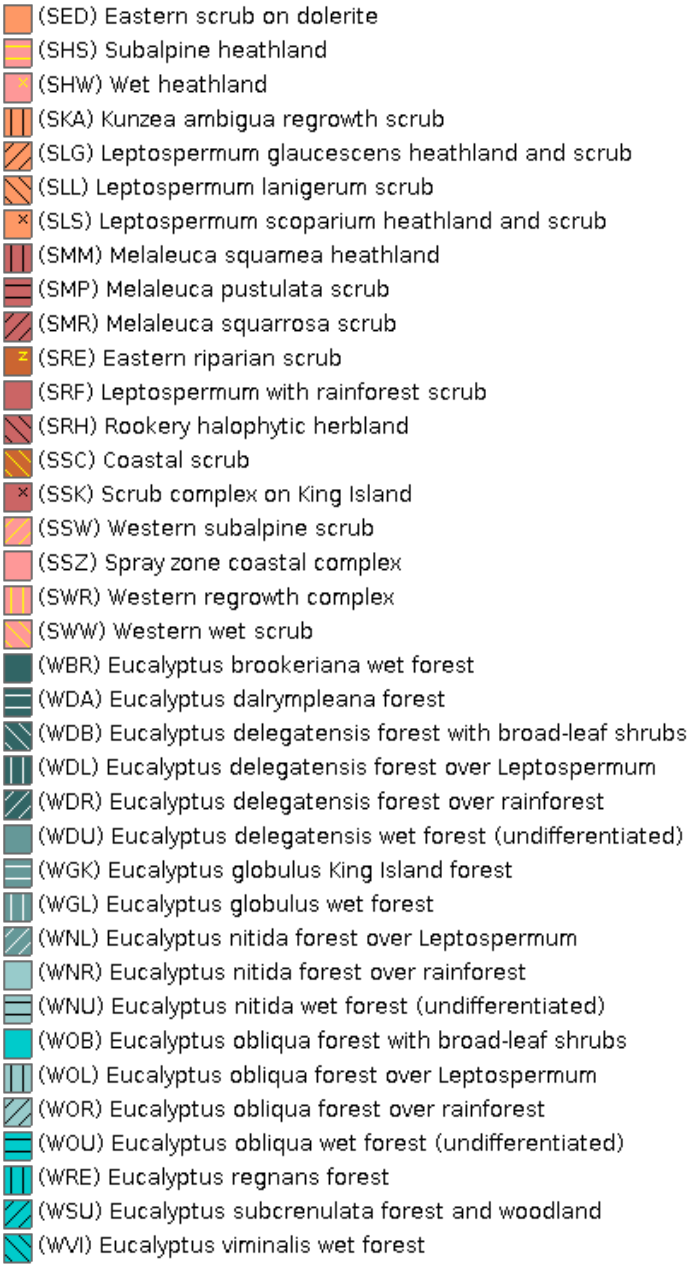
Please note that some layers may not display at all requested map scales

TASVEG 4.0 Communities within 1000 metres

Legend: TASVEG 4.0

TASVEG 4.0 Communities within 1000 metres





Legend: Cadastral Parcels

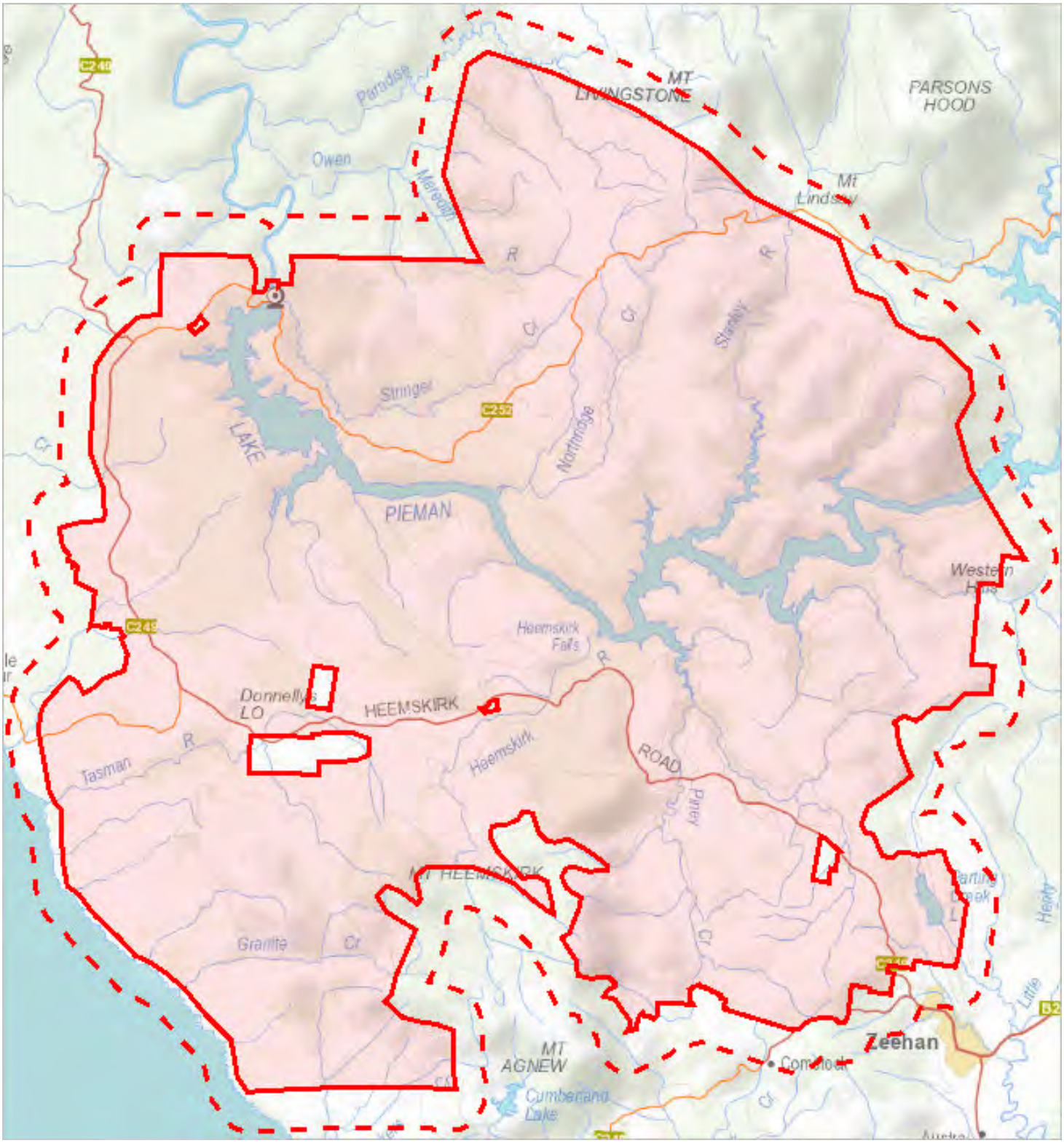
TASVEG 4.0 Communities within 1000 metres

Code	Community	Canopy Tree
DNI	(DNI) Eucalyptus nitida dry forest and woodland	
DOB	(DOB) Eucalyptus obliqua dry forest	
DOV	(DOV) Eucalyptus ovata forest and woodland	
FAG	(FAG) Agricultural land	
FPE	(FPE) Permanent easements	
FPF	(FPF) Pteridium esculentum fernland	
FRG	(FRG) Regenerating cleared land	
FUM	(FUM) Extra-urban miscellaneous	
FUR	(FUR) Urban areas	
FWU	(FWU) Weed infestation	
GHC	(GHC) Coastal grass and herbfield	
MBP	(MBP) Pure buttongrass moorland	
MBR	(MBR) Sparse buttongrass moorland on slopes	
MBS	(MBS) Buttongrass moorland with emergent shrubs	EN
MBS	(MBS) Buttongrass moorland with emergent shrubs	
MBU	(MBU) Buttongrass moorland (undifferentiated)	EN
MBU	(MBU) Buttongrass moorland (undifferentiated)	
MBW	(MBW) Western buttongrass moorland	
MRR	(MRR) Restionaceae rushland	
MSW	(MSW) Western lowland sedgeland	
NAD	(NAD) Acacia dealbata forest	
NAR	(NAR) Acacia melanoxylon forest on rises	
NLA	(NLA) Leptospermum scoparium - Acacia mucronata forest	
NLE	(NLE) Leptospermum forest	
NLM	(NLM) Leptospermum lanigerum - Melaleuca squarrosa swamp forest	
NME	(NME) Melaleuca ericifolia swamp forest	
OAQ	(OAQ) Water, sea	
ORO	(ORO) Lichen lithosere	
OSM	(OSM) Sand, mud	
RFS	(RFS) Nothofagus gunnii rainforest scrub	
RHP	(RHP) Lagarostrobos franklinii rainforest and scrub	
RML	(RML) Nothofagus - Leptospermum short rainforest	
RMS	(RMS) Nothofagus - Phyllocladus short rainforest	EN
RMS	(RMS) Nothofagus - Phyllocladus short rainforest	
RMT	(RMT) Nothofagus - Atherosperma rainforest	
SAL	(SAL) Acacia longifolia coastal scrub	
SBM	(SBM) Banksia marginata wet scrub	
SBR	(SBR) Broad-leaf scrub	EN
SBR	(SBR) Broad-leaf scrub	
SCH	(SCH) Coastal heathland	
SLL	(SLL) Leptospermum lanigerum scrub	EL
SLL	(SLL) Leptospermum lanigerum scrub	
SLS	(SLS) Leptospermum scoparium heathland and scrub	
SMM	(SMM) Melaleuca squamea heathland	
SMR	(SMR) Melaleuca squarrosa scrub	EN
SMR	(SMR) Melaleuca squarrosa scrub	
SRF	(SRF) Leptospermum with rainforest scrub	EN
SRF	(SRF) Leptospermum with rainforest scrub	
SSC	(SSC) Coastal scrub	
SWR	(SWR) Western regrowth complex	
SWW	(SWW) Western wet scrub	EN
SWW	(SWW) Western wet scrub	
WNL	(WNL) Eucalyptus nitida forest over Leptospermum	EN
WNL	(WNL) Eucalyptus nitida forest over Leptospermum	
WNR	(WNR) Eucalyptus nitida forest over rainforest	EN
WNR	(WNR) Eucalyptus nitida forest over rainforest	
WNU	(WNU) Eucalyptus nitida wet forest (undifferentiated)	
WOL	(WOL) Eucalyptus obliqua forest over Leptospermum	
WOR	(WOR) Eucalyptus obliqua forest over rainforest	
WOU	(WOU) Eucalyptus obliqua wet forest (undifferentiated)	

For more information contact: Coordinator, Tasmanian Vegetation Monitoring and Mapping Program.
Telephone: (03) 6165 4320
Email: TVMMPSupport@nre.tas.gov.au
Address: GPO Box 44, Hobart, Tasmania, Australia, 7000

Threatened Communities (TNVC 2020) within 1000 metres

364809, 5386828



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Please note that some layers may not display at all requested map scales

Threatened Communities (TNVC 2020) within 1000 metres

Legend: Threatened Communities

- 1 - Alkaline pans
- 2 - Allocasuarina littoralis forest
- 3 - Athrotaxis cupressoides/Nothofagus gunnii short rainforest
- 4 - Athrotaxis cupressoides open woodland
- 5 - Athrotaxis cupressoides rainforest
- 6 - Athrotaxis selaginoides/Nothofagus gunnii short rainforest
- 7 - Athrotaxis selaginoides rainforest
- 8 - Athrotaxis selaginoides subalpine scrub
- 9 - Banksia marginata wet scrub
- 10 - Banksia serrata woodland
- 11 - Callitris rhomboidea forest
- 13 - Cushion moorland
- 14 -Eucalyptus amygdalina forest and woodland on sandstone
- 15 - Eucalyptus amygdalina inland forest and woodland on cainozoic deposits
- 16 - Eucalyptus brookeriana wet forest
- 17 - Eucalyptus globulus dry forest and woodland
- 18 - Eucalyptus globulus King Island forest
- 19 - Eucalyptus morrisbyi forest and woodland
- 20 - Eucalyptus ovata forest and woodland
- 21 - Eucalyptus risdonii forest and woodland
- 22 - Eucalyptus tenuiramis forest and woodland on sediments
- 23 - Eucalyptus viminalis - Eucalyptus globulus coastal forest and woodland
- 24 - Eucalyptus viminalis Furneaux forest and woodland
- 25 - Eucalyptus viminalis wet forest
- 26 - Heathland on calcareous substrates
- 27 - Heathland scrub complex at Wingaroo
- 28 - Highland grassy sedgeland
- 29 - Highland Poa grassland
- 30 - Melaleuca ericifolia swamp forest
- 31 - Melaleuca pustulata scrub
- 32 - Notelaea - Pomaderris - Beyeria forest
- 33 - Rainforest fernland
- 34 - Riparian scrub
- 35 - Seabird rookery complex
- 36 - Sphagnum peatland
- 36A - Spray zone coastal complex
- 37 - Subalpine Diplarrena latifolia rushland
- 38 - Subalpine Leptospermum nitidum woodland
- 39 - Wetlands

Legend: Cadastral Parcels

Threatened Communities (TNVC 2020) within 1000 metres

Scheduled Community Id	Scheduled Community Name
20	Eucalyptus ovata forest and woodland
30	Melaleuca ericifolia swamp forest
9	Banksia marginata wet scrub

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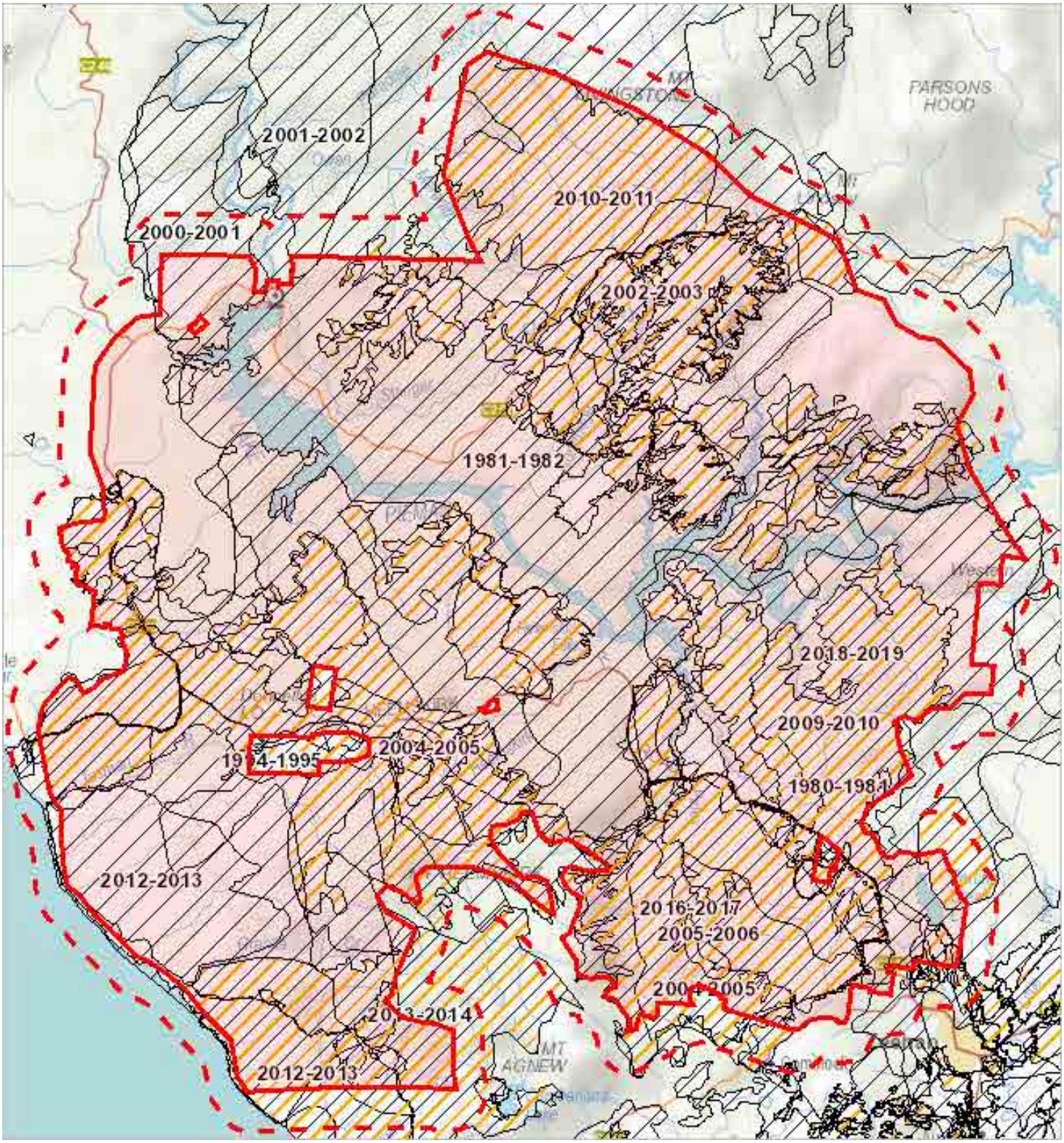
Fire History (All) within 1000 metres

364809, 5386828



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Fire History (All) within 1000 metres

Legend: Fire History All

Bushfire-Unknown Category

Bushfire

Completed Planned Burn

Legend: Cadastral Parcels

Fire History (All) within 1000 metres

Incident Number	Fire Name	Ignition Date	Fire Type	Ignition Cause	Fire Area (HA)
118794	Trial Harbour Rd	20-Jan-2006	Bushfire	Natural	3209.89170598
1405	Savage River	08-Feb-1982	Bushfire	Undetermined	53720.78380483
1407	Duck Creek Track	01-Jan-1991	Bushfire	Undetermined	311.4073445
1412	Oonah Hill	09-Mar-1999	Bushfire	Deliberate	68.17164012
1412	Piney Creek	01-Jan-1998	Bushfire	Undetermined	126.97364732
1414	Trial Harbour Road	13-Nov-1998	Bushfire	Deliberate	55.10877109
1419	Reece Dam	01-Jan-1995	Bushfire	Undetermined	57.64160583
1421	Piney Creek	01-Jan-1995	Bushfire	Undetermined	283.33420186
1708	Zeehan 2	20-Feb-2002	Bushfire	Deliberate	1.65842905
1709	Zeehan 1	20-Feb-2002	Bushfire	Deliberate	0.23020384
1712	Trial Harbour	01-Jan-2002	Bushfire	Undetermined	188.27098378
1713	Whyte River	15-Feb-2002	Bushfire	Undetermined	2612.99882487
1714	Whaleback Denison Tk	19-Feb-2002	Bushfire	Deliberate	214.23697086
19001107	12 Mile Creek, West Coast	12-Jan-2019	Bushfire	Accidental	0.09045881
19001658	Western Hills	15-Jan-2019	Bushfire	Natural	6492.13732475
199563	Zeehan Hwy	11-Nov-2012	Bushfire	Accidental	1313.79267225
200212	Granville Harbour Rd	29-Nov-2012	Bushfire	Accidental	1639.36992018
20025733	Heemskirk Road, West Coast	11-Sep-2020	Bushfire	Deliberate	16.8543994
20031090	Heemskirk Road, West coast	09-Nov-2020	Bushfire	Undetermined	10.78852791
205283	Climies Track	06-Apr-2013	Bushfire	Accidental	28.81771918
209246	Hurst St, Zeehan Dam	04-Sep-2013	Bushfire	Accidental	21.46101334
21019253	Climies Track campfire, Granville Harbour	02-Oct-2020	Bushfire	Deliberate	4.205E-4
213708	Heemskirk Rd	28-Jan-2014	Bushfire	Natural	737.93070042
214393	Granville Harbour Rd	12-Feb-2014	Bushfire	Natural	2.5E-7
215381	Mt Heemskirk	11-Mar-2014	Bushfire	Natural	459.62208005
22004239	Heemskirk Road, Granville Harbour	29-Jan-2022	Bushfire	Deliberate	0.4130383
22010478	Whaleback Ridge, West Coast	15-Mar-2022	Bushfire	Natural	4.54139132
235892	Heemskirk Road Zeehan	14-Jan-2016	Bushfire	Undetermined	83.96829075
235895	Heemskirk Road Corinna	14-Jan-2016	Bushfire	Undetermined	0.93799937
235923	Watsons Creek	13-Jan-2016	Bushfire	Natural	660.7146216
258798	Heemskirk Rd, Zeehan	22-Jan-2018	Bushfire	Undetermined	1.2011E-4
262911	Big Rocky Creek, Granville Harbour	24-Dec-2017	Bushfire	Accidental	1.0342E-4
600	Comstock Creek	16-Feb-1992	Bushfire	Deliberate	36.68175829
603	Pieman River	14-Jan-2001	Bushfire	Natural	1661.41926122
604	Granville harbour	14-Jan-1997	Bushfire	Undetermined	38.61112046
606	Pieman River	23-Jan-1995	Bushfire	Natural	10790.56162418
96357	Lake Cumberland	15-Nov-2003	Bushfire	Natural	47.07657328
96360	Climes Track	15-Nov-2003	Bushfire	Natural	12.33522573
CRRRR094SFR	CRRRR094SFR - Mount Zeehan	15-Jul-2020	Planned Burn	Planned Burn	942.26208791
MERRR041SFR	MERRR041SFR - Whaleback Ridge South	17-Mar-2020	Planned Burn	Planned Burn	1230.46488074
MERRR042SFR	MERRR042SFR - Whaleback Ridge East	12-May-2022	Planned Burn	Planned Burn	1091.3311143
MRRRSFR01	Whaleback Ridge MRRRSFR01	08-Apr-2011	Planned Burn	Planned Burn	2685.45371147
MTHRR008APZ	Granville Rd South MTHRR008APZ	22-Mar-2015	Planned Burn	Planned Burn	484.51867547
MTHRR010SFR	Heemskirk Rd South MTHRR010SFR	02-Jun-2016	Planned Burn	Planned Burn	845.51755706
MTHRR011APZ	Tasman River MTHRR011APZ	22-Mar-2015	Planned Burn	Planned Burn	559.18643085
MTHRR012ECO	Old Zeehan Woodyard - MTHRR012ECO	19-Apr-2016	Planned Burn	Planned Burn	2.49346728
MTHRR012SFR	Montana Flats MTHRR012SFR	29-Oct-2016	Planned Burn	Planned Burn	27.26945073
MTHRR012SFR	Montana Flats MTHRR012SFR/Piney Creek MTHRRSFR	27-Feb-2017	Planned Burn	Planned Burn	3408.38825308
MTHRR095SFR	Piney Creek South MTHRR095SFR	02-Jun-2016	Planned Burn	Planned Burn	100.13767112
MTHRREC047	Mt Heemskirk MTHRREC047	17-Apr-2014	Planned Burn	Planned Burn	2393.82155275
MTHRRECO47	Mt Heemskirk MTHRRECO47	06-Apr-2013	Planned Burn	Planned Burn	1306.85691901
TWZ108BU	Zeehan East FRB	17-Oct-2017	Planned Burn	Planned Burn	40.36839767
UNACL101APZ	Parting Creek UNACL101APZ	08-May-2014	Planned Burn	Planned Burn	82.87498955
UNACL101APZ	UNACL101APZ - Parting Creek	18-Sep-2020	Planned Burn	Planned Burn	102.73042048
UNACL103AP	UNACL103AP - Montana Hill	20-Nov-2021	Planned Burn	Planned Burn	10.89179417
UNACL103AP	UNACL103AP - Montana Hill	10-May-2022	Planned Burn	Planned Burn	9.88269538
UNACL103APZ	Montana Hill UNACL103APZ	29-Apr-2014	Planned Burn	Planned Burn	27.65447337
	FRBU Heemskirk	29-Oct-2004	Planned Burn	Planned Burn	291.52957906
	FRBU Heemskirk	29-Oct-2004	Planned Burn	Planned Burn	462.3703701
	FRBU Heemskirk	29-Oct-2004	Planned Burn	Planned Burn	3488.51267146
	FRBU Rocky Creek Nth	12-Nov-2013	Planned Burn	Planned Burn	557.69297234
	Heemskirk Falls	01-Jan-1990	Planned Burn	Planned Burn	274.96313697

Fire History (All) within 1000 metres

Incident Number	Fire Name	Ignition Date	Fire Type	Ignition Cause	Fire Area (HA)
	Montana Flats	07-May-2003	Planned Burn	Planned Burn	377.54333733
	Montana Flats	19-May-2005	Planned Burn	Planned Burn	85.52825743
	Montana Hill	01-Jan-2002	Planned Burn	Planned Burn	36.39910992
	Parting Creek	01-Jan-2002	Planned Burn	Planned Burn	92.57578624
	Parting Creek Lake	19-May-2005	Planned Burn	Planned Burn	386.73189521
	Piney Creek South	18-May-2005	Planned Burn	Planned Burn	1276.99788597
	Reece Dam	01-Jan-1996	Planned Burn	Planned Burn	540.69066174
	Trial Creek Track	08-Oct-1997	Planned Burn	Planned Burn	837.84372516
	Trial Creek Track East	19-Apr-2010	Planned Burn	Planned Burn	2168.66101416
	Watsons Creek north	01-Jan-1990	Planned Burn	Planned Burn	518.68139113
	Watsons Creek south	01-Jan-1995	Planned Burn	Planned Burn	371.64038545
	Whaleback Ridge	01-Jan-2001	Planned Burn	Planned Burn	1869.04695185
	Whaleback Ridge	01-May-2002	Planned Burn	Planned Burn	349.82120921
	Whaleback Ridge zone B	07-May-2003	Planned Burn	Planned Burn	1620.00304069
	Zeehan	28-Jan-1981	Bushfire	Undetermined	13526.7807773
	Zeehan Airport	08-May-2003	Planned Burn	Planned Burn	104.67595803
		09-Nov-2017	Unknown	Undetermined	5.99227678
		12-Jul-2019	Unknown	Undetermined	1.74423389
		29-Sep-2020	Unknown	Undetermined	3.53462022

For more information about Fire History, please contact the Manager Community Protection Planning, Tasmania Fire Service.
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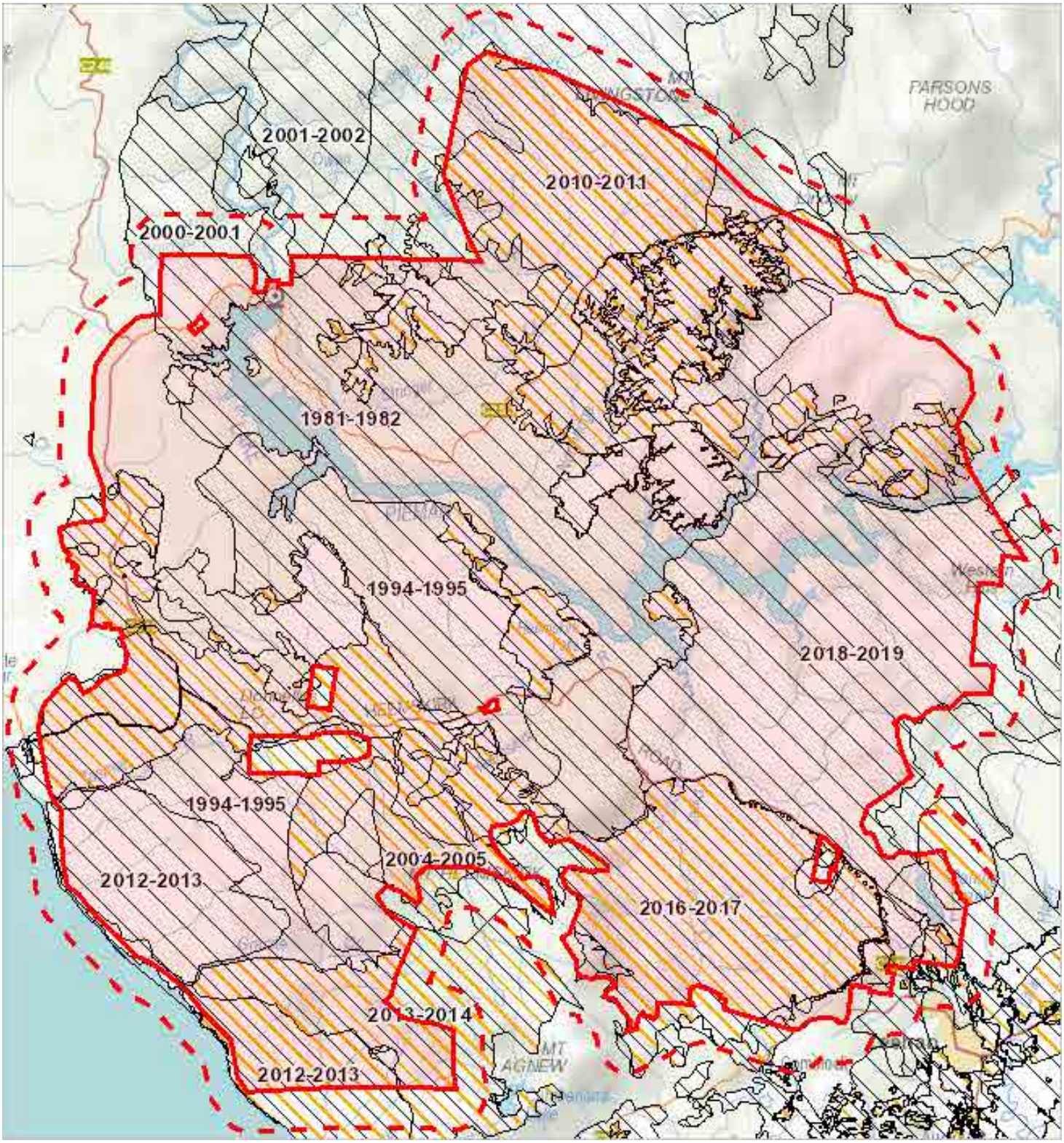
Email: planning@fire.tas.gov.au
Address: cnr Argyle and Melville Streets, Hobart, Tasmania, Australia, 7000

Fire History (Last Burnt) within 1000 metres

364809, 5386828



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Fire History (Last Burnt) within 1000 metres

Legend: Fire History Last

Bushfire-Unknown category

Bushfire

Completed Planned Burn

Legend: Cadastral Parcels

Fire History (Last Burnt) within 1000 metres

Incident Number	Fire Name	Ignition Date	Fire Type	Ignition Cause	Fire Area (HA)
118794	Trial Harbour Rd	20-Jan-2006	Bushfire	Natural	3209.89170598
1405	Savage River	08-Feb-1982	Bushfire	Undetermined	53720.78380483
1407	Duck Creek Track	01-Jan-1991	Bushfire	Undetermined	311.4073445
1412	Oonah Hill	09-Mar-1999	Bushfire	Deliberate	68.17164012
1414	Trial Harbour Road	13-Nov-1998	Bushfire	Deliberate	55.10877109
1419	Reece Dam	01-Jan-1995	Bushfire	Undetermined	57.64160583
1421	Piney Creek	01-Jan-1995	Bushfire	Undetermined	283.33420186
1708	Zeehan 2	20-Feb-2002	Bushfire	Deliberate	1.65842905
1709	Zeehan 1	20-Feb-2002	Bushfire	Deliberate	0.23020384
1712	Trial Harbour	01-Jan-2002	Bushfire	Undetermined	188.27098378
1713	Whyte River	15-Feb-2002	Bushfire	Undetermined	2612.99882487
1714	Whaleback Denison Tk	19-Feb-2002	Bushfire	Deliberate	214.23697086
19001107	12 Mile Creek, West Coast	12-Jan-2019	Bushfire	Accidental	0.09045881
19001658	Western Hills	15-Jan-2019	Bushfire	Natural	6492.13732475
200212	Granville Harbour Rd	29-Nov-2012	Bushfire	Accidental	1639.36992018
20025733	Heemskirk Road, West Coast	11-Sep-2020	Bushfire	Deliberate	16.8543994
20031090	Heemskirk Road, West coast	09-Nov-2020	Bushfire	Undetermined	10.78852791
205283	Climies Track	06-Apr-2013	Bushfire	Accidental	28.81771918
209246	Hurst St, Zeehan Dam	04-Sep-2013	Bushfire	Accidental	21.46101334
21019253	Climies Track campfire, Granville Harbour	02-Oct-2020	Bushfire	Deliberate	4.205E-4
213708	Heemskirk Rd	28-Jan-2014	Bushfire	Natural	737.93070042
215381	Mt Heemskirk	11-Mar-2014	Bushfire	Natural	459.62208005
22004239	Heemskirk Road, Granville Harbour	29-Jan-2022	Bushfire	Deliberate	0.4130383
22010478	Whaleback Ridge, West Coast	15-Mar-2022	Bushfire	Natural	4.54139132
235892	Heemskirk Road Zeehan	14-Jan-2016	Bushfire	Undetermined	83.96829075
235895	Heemskirk Road Corinna	14-Jan-2016	Bushfire	Undetermined	0.93799937
235923	Watsons Creek	13-Jan-2016	Bushfire	Natural	660.7146216
258798	Heemskirk Rd, Zeehan	22-Jan-2018	Bushfire	Undetermined	1.2011E-4
262911	Big Rocky Creek, Granville Harbour	24-Dec-2017	Bushfire	Accidental	1.0342E-4
600	Comstock Creek	16-Feb-1992	Bushfire	Deliberate	36.68175829
603	Pieman River	14-Jan-2001	Bushfire	Natural	1661.41926122
604	Granville harbour	14-Jan-1997	Bushfire	Undetermined	38.61112046
606	Pieman River	23-Jan-1995	Bushfire	Natural	10790.56162418
CRRRR094SFR	CRRRR094SFR - Mount Zeehan	15-Jul-2020	Planned Burn	Planned Burn	942.26208791
MERRR041SFR	MERRR041SFR - Whaleback Ridge South	17-Mar-2020	Planned Burn	Planned Burn	1230.46488074
MERRR042SFR	MERRR042SFR - Whaleback Ridge East	12-May-2022	Planned Burn	Planned Burn	1091.3311143
MRRRSFR01	Whaleback Ridge MRRRSFR01	08-Apr-2011	Planned Burn	Planned Burn	2685.45371147
MTHRR008APZ	Granville Rd South MTHRR008APZ	22-Mar-2015	Planned Burn	Planned Burn	484.51867547
MTHRR010SFR	Heemskirk Rd South MTHRR010SFR	02-Jun-2016	Planned Burn	Planned Burn	845.51755706
MTHRR011APZ	Tasman River MTHRR011APZ	22-Mar-2015	Planned Burn	Planned Burn	559.18643085
MTHRR012ECO	Old Zeehan Woodyard - MTHRR012ECO	19-Apr-2016	Planned Burn	Planned Burn	2.49346728
MTHRR012SFR	Montana Flats MTHRR012SFR	29-Oct-2016	Planned Burn	Planned Burn	27.26945073
MTHRR012SFR	Montana Flats MTHRR012SFR/Piney Creek MTHRRSFR	27-Feb-2017	Planned Burn	Planned Burn	3408.38825308
MTHRR095SFR	Piney Creek South MTHRR095SFR	02-Jun-2016	Planned Burn	Planned Burn	100.13767112
MTHRREC047	Mt Heemskirk MTHRREC047	17-Apr-2014	Planned Burn	Planned Burn	2393.82155275
MTHRRECO47	Mt Heemskirk MTHRRECO47	06-Apr-2013	Planned Burn	Planned Burn	1306.85691901
TWZ108BU	Zeehan East FRB	17-Oct-2017	Planned Burn	Planned Burn	40.36839767
UNACL101APZ	Parting Creek UNACL101APZ	08-May-2014	Planned Burn	Planned Burn	82.87498955
UNACL101APZ	UNACL101APZ - Parting Creek	18-Sep-2020	Planned Burn	Planned Burn	102.73042048
UNACL103AP	UNACL103AP - Montana Hill	20-Nov-2021	Planned Burn	Planned Burn	10.89179417
UNACL103AP	UNACL103AP - Montana Hill	10-May-2022	Planned Burn	Planned Burn	9.88269538
UNACL103APZ	Montana Hill UNACL103APZ	29-Apr-2014	Planned Burn	Planned Burn	27.65447337
	FRBU Heemskirk	29-Oct-2004	Planned Burn	Planned Burn	291.52957906
	FRBU Heemskirk	29-Oct-2004	Planned Burn	Planned Burn	462.3703701
	FRBU Heemskirk	29-Oct-2004	Planned Burn	Planned Burn	3488.51267146
	FRBU Rocky Creek Nth	12-Nov-2013	Planned Burn	Planned Burn	557.69297234
	Heemskirk Falls	01-Jan-1990	Planned Burn	Planned Burn	274.96313697
	Montana Flats	07-May-2003	Planned Burn	Planned Burn	377.54333733
	Montana Hill	01-Jan-2002	Planned Burn	Planned Burn	36.39910992
	Parting Creek	01-Jan-2002	Planned Burn	Planned Burn	92.57578624
	Parting Creek Lake	19-May-2005	Planned Burn	Planned Burn	386.73189521
	Piney Creek South	18-May-2005	Planned Burn	Planned Burn	1276.99788597

Fire History (Last Burnt) within 1000 metres

Incident Number	Fire Name	Ignition Date	Fire Type	Ignition Cause	Fire Area (HA)
	Reece Dam	01-Jan-1996	Planned Burn	Planned Burn	540.69066174
	Trial Creek Track	08-Oct-1997	Planned Burn	Planned Burn	837.84372516
	Trial Creek Track East	19-Apr-2010	Planned Burn	Planned Burn	2168.66101416
	Watsons Creek north	01-Jan-1990	Planned Burn	Planned Burn	518.68139113
	Whaleback Ridge	01-Jan-2001	Planned Burn	Planned Burn	1869.04695185
	Whaleback Ridge	01-May-2002	Planned Burn	Planned Burn	349.82120921
	Whaleback Ridge zone B	07-May-2003	Planned Burn	Planned Burn	1620.00304069
	Zeehan	28-Jan-1981	Bushfire	Undetermined	13526.7807773
	Zeehan Airport	08-May-2003	Planned Burn	Planned Burn	104.67595803
		09-Nov-2017	Unknown	Undetermined	5.99227678
		12-Jul-2019	Unknown	Undetermined	1.74423389
		29-Sep-2020	Unknown	Undetermined	3.53462022

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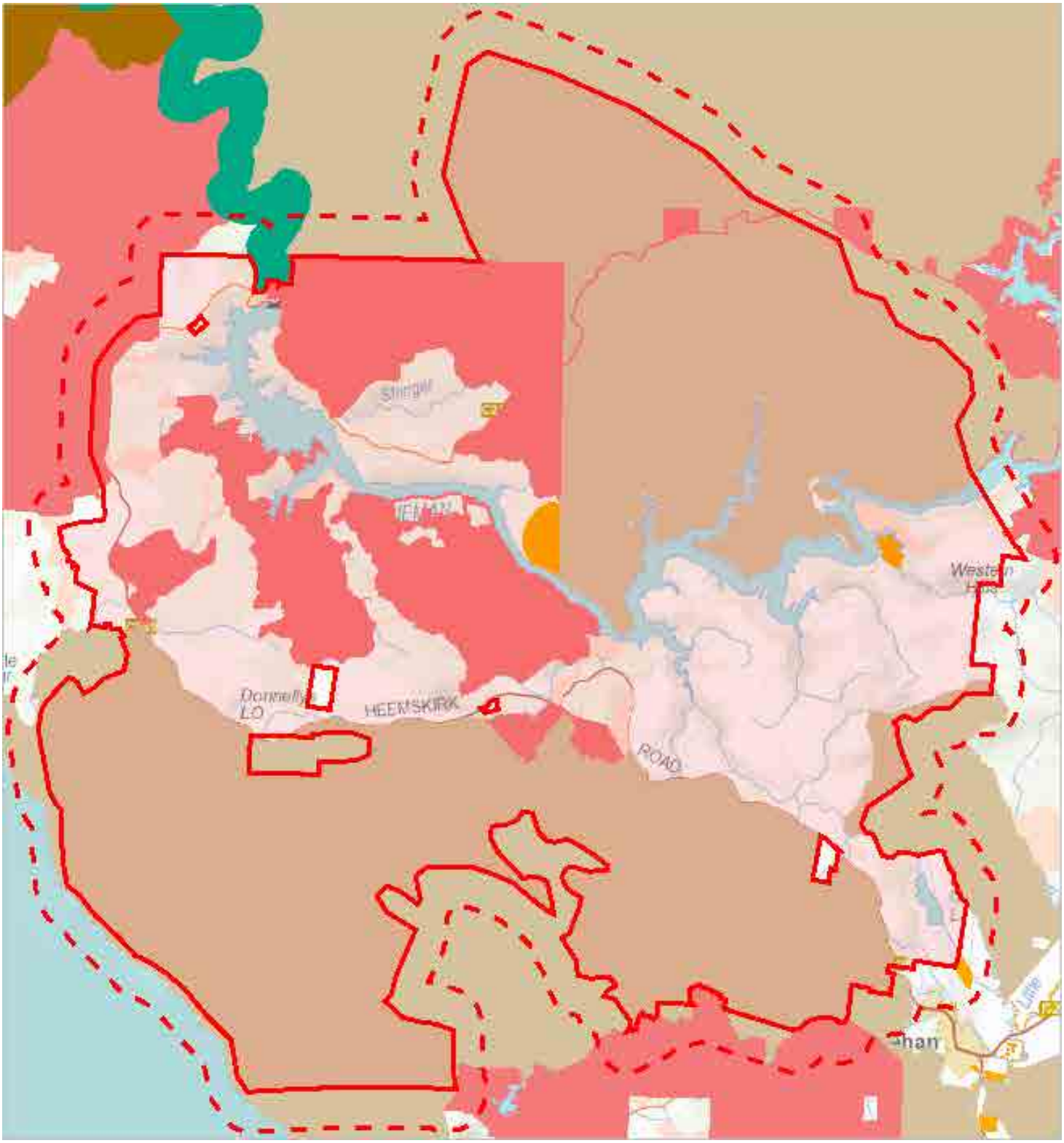
Reserves within 1000 metres

364809, 5386828



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Please note that some layers may not display at all requested map scales

Reserves within 1000 metres

Legend: Tasmanian Reserve Estate

- Conservation Area
- Conservation Area and Conservation Covenant (NCA)
- Game Reserve
- Historic Site
- Indigenous Protected Area
- National Park
- Nature Reserve
- Nature Recreation Area
- Regional Reserve
- State Reserve
- Wellington Park
- Public authority land within WHA
- Future Potential Production Forest
- Informal Reserve on Permanent Timber Production Zone Land or STT managed land
- Informal Reserve on other public land
- Roadside Conservation Site
- Conservation Covenant (NCA)
- Private Nature Reserve and Conservation Covenant (NCA)
- Private Sanctuary and Conservation Covenant (NCA)
- Private Sanctuary
- Private land within WHA
- Management Agreement
- Stewardship Agreement
- Part 5 Agreement (Meander Dam Offset)
- Other Private Reserve

Legend: Cadastral Parcels

Reserves within 1000 metres

Name	Classification	Status	Area (HA)
Crotty Ridge Regional Reserve	Regional Reserve	Other Formal Reserve	3125.11709532
Meredith Range Regional Reserve	Regional Reserve	Other Formal Reserve	7666.15342902
Meredith Range Regional Reserve	Regional Reserve	Other Formal Reserve	63728.6602921
Mount Heemskirk Regional Reserve	Regional Reserve	Other Formal Reserve	0.01008449
Mount Heemskirk Regional Reserve	Regional Reserve	Other Formal Reserve	0.01046062
Mount Heemskirk Regional Reserve	Regional Reserve	Other Formal Reserve	0.0106001
Mount Heemskirk Regional Reserve	Regional Reserve	Other Formal Reserve	0.01086336
Mount Heemskirk Regional Reserve	Regional Reserve	Other Formal Reserve	0.01108414
Mount Heemskirk Regional Reserve	Regional Reserve	Other Formal Reserve	0.01121511
Mount Heemskirk Regional Reserve	Regional Reserve	Other Formal Reserve	0.01185921
Mount Heemskirk Regional Reserve	Regional Reserve	Other Formal Reserve	0.01277996
Mount Heemskirk Regional Reserve	Regional Reserve	Other Formal Reserve	0.01282786
Mount Heemskirk Regional Reserve	Regional Reserve	Other Formal Reserve	0.01340075
Mount Heemskirk Regional Reserve	Regional Reserve	Other Formal Reserve	0.01386227
Mount Heemskirk Regional Reserve	Regional Reserve	Other Formal Reserve	0.01417689
Mount Heemskirk Regional Reserve	Regional Reserve	Other Formal Reserve	0.01449229
Mount Heemskirk Regional Reserve	Regional Reserve	Other Formal Reserve	0.01450732
Mount Heemskirk Regional Reserve	Regional Reserve	Other Formal Reserve	0.01455749
Mount Heemskirk Regional Reserve	Regional Reserve	Other Formal Reserve	0.0152339
Mount Heemskirk Regional Reserve	Regional Reserve	Other Formal Reserve	0.0155938
Mount Heemskirk Regional Reserve	Regional Reserve	Other Formal Reserve	0.01561373
Mount Heemskirk Regional Reserve	Regional Reserve	Other Formal Reserve	0.01624546
Mount Heemskirk Regional Reserve	Regional Reserve	Other Formal Reserve	0.01796055
Mount Heemskirk Regional Reserve	Regional Reserve	Other Formal Reserve	0.01853161
Mount Heemskirk Regional Reserve	Regional Reserve	Other Formal Reserve	0.01854883
Mount Heemskirk Regional Reserve	Regional Reserve	Other Formal Reserve	0.01878139
Mount Heemskirk Regional Reserve	Regional Reserve	Other Formal Reserve	0.01927071
Mount Heemskirk Regional Reserve	Regional Reserve	Other Formal Reserve	0.02008495
Mount Heemskirk Regional Reserve	Regional Reserve	Other Formal Reserve	0.0203314
Mount Heemskirk Regional Reserve	Regional Reserve	Other Formal Reserve	0.02176027
Mount Heemskirk Regional Reserve	Regional Reserve	Other Formal Reserve	0.02255649
Mount Heemskirk Regional Reserve	Regional Reserve	Other Formal Reserve	0.0228373
Mount Heemskirk Regional Reserve	Regional Reserve	Other Formal Reserve	0.02432079
Mount Heemskirk Regional Reserve	Regional Reserve	Other Formal Reserve	0.02559061
Mount Heemskirk Regional Reserve	Regional Reserve	Other Formal Reserve	0.02591619
Mount Heemskirk Regional Reserve	Regional Reserve	Other Formal Reserve	0.03008748
Mount Heemskirk Regional Reserve	Regional Reserve	Other Formal Reserve	0.03186686
Mount Heemskirk Regional Reserve	Regional Reserve	Other Formal Reserve	0.03323385
Mount Heemskirk Regional Reserve	Regional Reserve	Other Formal Reserve	0.03373141
Mount Heemskirk Regional Reserve	Regional Reserve	Other Formal Reserve	0.03390831
Mount Heemskirk Regional Reserve	Regional Reserve	Other Formal Reserve	0.03470254
Mount Heemskirk Regional Reserve	Regional Reserve	Other Formal Reserve	0.03491176
Mount Heemskirk Regional Reserve	Regional Reserve	Other Formal Reserve	0.03522023
Mount Heemskirk Regional Reserve	Regional Reserve	Other Formal Reserve	0.03531049
Mount Heemskirk Regional Reserve	Regional Reserve	Other Formal Reserve	0.03569001
Mount Heemskirk Regional Reserve	Regional Reserve	Other Formal Reserve	0.03982602
Mount Heemskirk Regional Reserve	Regional Reserve	Other Formal Reserve	0.04524843
Mount Heemskirk Regional Reserve	Regional Reserve	Other Formal Reserve	0.04552068
Mount Heemskirk Regional Reserve	Regional Reserve	Other Formal Reserve	0.04723361
Mount Heemskirk Regional Reserve	Regional Reserve	Other Formal Reserve	0.05074835
Mount Heemskirk Regional Reserve	Regional Reserve	Other Formal Reserve	0.05525827
Mount Heemskirk Regional Reserve	Regional Reserve	Other Formal Reserve	0.06752907
Mount Heemskirk Regional Reserve	Regional Reserve	Other Formal Reserve	0.0735169
Mount Heemskirk Regional Reserve	Regional Reserve	Other Formal Reserve	0.07507492
Mount Heemskirk Regional Reserve	Regional Reserve	Other Formal Reserve	0.08194641
Mount Heemskirk Regional Reserve	Regional Reserve	Other Formal Reserve	0.09049867
Mount Heemskirk Regional Reserve	Regional Reserve	Other Formal Reserve	0.09179082
Mount Heemskirk Regional Reserve	Regional Reserve	Other Formal Reserve	0.11856749
Mount Heemskirk Regional Reserve	Regional Reserve	Other Formal Reserve	0.13506558
Mount Heemskirk Regional Reserve	Regional Reserve	Other Formal Reserve	0.18477237
Mount Heemskirk Regional Reserve	Regional Reserve	Other Formal Reserve	0.18619334
Mount Heemskirk Regional Reserve	Regional Reserve	Other Formal Reserve	0.22923067

Reserves within 1000 metres

Name	Classification	Status	Area (HA)
Mount Heemskirk Regional Reserve	Regional Reserve	Other Formal Reserve	0.24084163
Mount Heemskirk Regional Reserve	Regional Reserve	Other Formal Reserve	0.2673796
Mount Heemskirk Regional Reserve	Regional Reserve	Other Formal Reserve	0.40189757
Mount Heemskirk Regional Reserve	Regional Reserve	Other Formal Reserve	0.66431472
Mount Heemskirk Regional Reserve	Regional Reserve	Other Formal Reserve	1.49868052
Mount Heemskirk Regional Reserve	Regional Reserve	Other Formal Reserve	1.79779059
Mount Heemskirk Regional Reserve	Regional Reserve	Other Formal Reserve	2.13416473
Mount Heemskirk Regional Reserve	Regional Reserve	Other Formal Reserve	4.21731506
Mount Heemskirk Regional Reserve	Regional Reserve	Other Formal Reserve	6.34584799
Mount Heemskirk Regional Reserve	Regional Reserve	Other Formal Reserve	16701.6374578
Parting Creek Regional Reserve	Regional Reserve	Other Formal Reserve	1880.68239802
Pieman River State Reserve	State Reserve	Dedicated Formal Reserve	3561.82182595
	Future Potential Production Forest	Informal Reserve	17.7028158
	Future Potential Production Forest	Informal Reserve	34.24752236
	Future Potential Production Forest	Informal Reserve	229.77613773
	Future Potential Production Forest	Informal Reserve	294.08471237
	Future Potential Production Forest	Informal Reserve	634.18933313
	Future Potential Production Forest	Informal Reserve	1254.67920256
	Future Potential Production Forest	Informal Reserve	1565.13749131
	Future Potential Production Forest	Informal Reserve	3292.79956834
	Future Potential Production Forest	Informal Reserve	6411.49318939
	Future Potential Production Forest	Informal Reserve	14408.9003706
	Informal Reserve on Permanent Timber Production Zone Land or STT managed land	Informal Reserve	0.0164817
	Informal Reserve on Permanent Timber Production Zone Land or STT managed land	Informal Reserve	0.01664607
	Informal Reserve on Permanent Timber Production Zone Land or STT managed land	Informal Reserve	0.0169609
	Informal Reserve on Permanent Timber Production Zone Land or STT managed land	Informal Reserve	0.01751819
	Informal Reserve on Permanent Timber Production Zone Land or STT managed land	Informal Reserve	0.01796289
	Informal Reserve on Permanent Timber Production Zone Land or STT managed land	Informal Reserve	0.01823347
	Informal Reserve on Permanent Timber Production Zone Land or STT managed land	Informal Reserve	0.01906902
	Informal Reserve on Permanent Timber Production Zone Land or STT managed land	Informal Reserve	0.02131758
	Informal Reserve on Permanent Timber Production Zone Land or STT managed land	Informal Reserve	0.02287428
	Informal Reserve on Permanent Timber Production Zone Land or STT managed land	Informal Reserve	0.02301881
	Informal Reserve on Permanent Timber Production Zone Land or STT managed land	Informal Reserve	0.02849083
	Informal Reserve on Permanent Timber Production Zone Land or STT managed land	Informal Reserve	0.03180671
	Informal Reserve on Permanent Timber Production Zone Land or STT managed land	Informal Reserve	0.03314119
	Informal Reserve on Permanent Timber Production Zone Land or STT managed land	Informal Reserve	0.03424951
	Informal Reserve on Permanent Timber Production Zone Land or STT managed land	Informal Reserve	0.03497781
	Informal Reserve on Permanent Timber Production Zone Land or STT managed land	Informal Reserve	0.03498118
	Informal Reserve on Permanent Timber Production Zone Land or STT managed land	Informal Reserve	0.03569109
	Informal Reserve on Permanent Timber Production Zone Land or STT managed land	Informal Reserve	0.03605223
	Informal Reserve on Permanent Timber Production Zone Land or STT managed land	Informal Reserve	0.0364178
	Informal Reserve on Permanent Timber Production Zone Land or STT managed land	Informal Reserve	0.03750231

Reserves within 1000 metres

Name	Classification	Status	Area (HA)
	Informal Reserve on Permanent Timber Production Zone Land or STT managed land	Informal Reserve	0.0388905
	Informal Reserve on Permanent Timber Production Zone Land or STT managed land	Informal Reserve	0.0407423
	Informal Reserve on Permanent Timber Production Zone Land or STT managed land	Informal Reserve	0.04110271
	Informal Reserve on Permanent Timber Production Zone Land or STT managed land	Informal Reserve	0.04365375
	Informal Reserve on Permanent Timber Production Zone Land or STT managed land	Informal Reserve	0.04373034
	Informal Reserve on Permanent Timber Production Zone Land or STT managed land	Informal Reserve	0.04672552
	Informal Reserve on Permanent Timber Production Zone Land or STT managed land	Informal Reserve	0.05123018
	Informal Reserve on Permanent Timber Production Zone Land or STT managed land	Informal Reserve	0.05561039
	Informal Reserve on Permanent Timber Production Zone Land or STT managed land	Informal Reserve	0.05846568
	Informal Reserve on Permanent Timber Production Zone Land or STT managed land	Informal Reserve	0.0596724
	Informal Reserve on Permanent Timber Production Zone Land or STT managed land	Informal Reserve	0.06355821
	Informal Reserve on Permanent Timber Production Zone Land or STT managed land	Informal Reserve	0.06689972
	Informal Reserve on Permanent Timber Production Zone Land or STT managed land	Informal Reserve	0.07582936
	Informal Reserve on Permanent Timber Production Zone Land or STT managed land	Informal Reserve	0.07742495
	Informal Reserve on Permanent Timber Production Zone Land or STT managed land	Informal Reserve	0.08548
	Informal Reserve on Permanent Timber Production Zone Land or STT managed land	Informal Reserve	0.087562
	Informal Reserve on Permanent Timber Production Zone Land or STT managed land	Informal Reserve	0.11616282
	Informal Reserve on Permanent Timber Production Zone Land or STT managed land	Informal Reserve	0.12433181
	Informal Reserve on Permanent Timber Production Zone Land or STT managed land	Informal Reserve	0.13450204
	Informal Reserve on Permanent Timber Production Zone Land or STT managed land	Informal Reserve	0.14691828
	Informal Reserve on Permanent Timber Production Zone Land or STT managed land	Informal Reserve	0.15630425
	Informal Reserve on Permanent Timber Production Zone Land or STT managed land	Informal Reserve	0.16544433
	Informal Reserve on Permanent Timber Production Zone Land or STT managed land	Informal Reserve	0.16788276
	Informal Reserve on Permanent Timber Production Zone Land or STT managed land	Informal Reserve	0.17658394
	Informal Reserve on Permanent Timber Production Zone Land or STT managed land	Informal Reserve	0.20087599
	Informal Reserve on Permanent Timber Production Zone Land or STT managed land	Informal Reserve	0.21870075
	Informal Reserve on Permanent Timber Production Zone Land or STT managed land	Informal Reserve	0.22100457
	Informal Reserve on Permanent Timber Production Zone Land or STT managed land	Informal Reserve	0.25424899
	Informal Reserve on Permanent Timber Production Zone Land or STT managed land	Informal Reserve	0.25602872
	Informal Reserve on Permanent Timber Production Zone Land or STT managed land	Informal Reserve	0.2629889
	Informal Reserve on Permanent Timber Production Zone Land or STT managed land	Informal Reserve	0.35989629
	Informal Reserve on Permanent Timber Production Zone Land or STT managed land	Informal Reserve	0.39910409
	Informal Reserve on Permanent Timber Production Zone Land or STT managed land	Informal Reserve	0.41128693
	Informal Reserve on Permanent Timber Production Zone Land or STT managed land	Informal Reserve	0.4293636
	Informal Reserve on Permanent Timber Production Zone Land or STT managed land	Informal Reserve	0.43425439
	Informal Reserve on Permanent Timber Production Zone Land or STT managed land	Informal Reserve	0.52810676
	Informal Reserve on Permanent Timber Production Zone Land or STT managed land	Informal Reserve	0.54088485
	Informal Reserve on Permanent Timber Production Zone Land or STT managed land	Informal Reserve	0.67575185

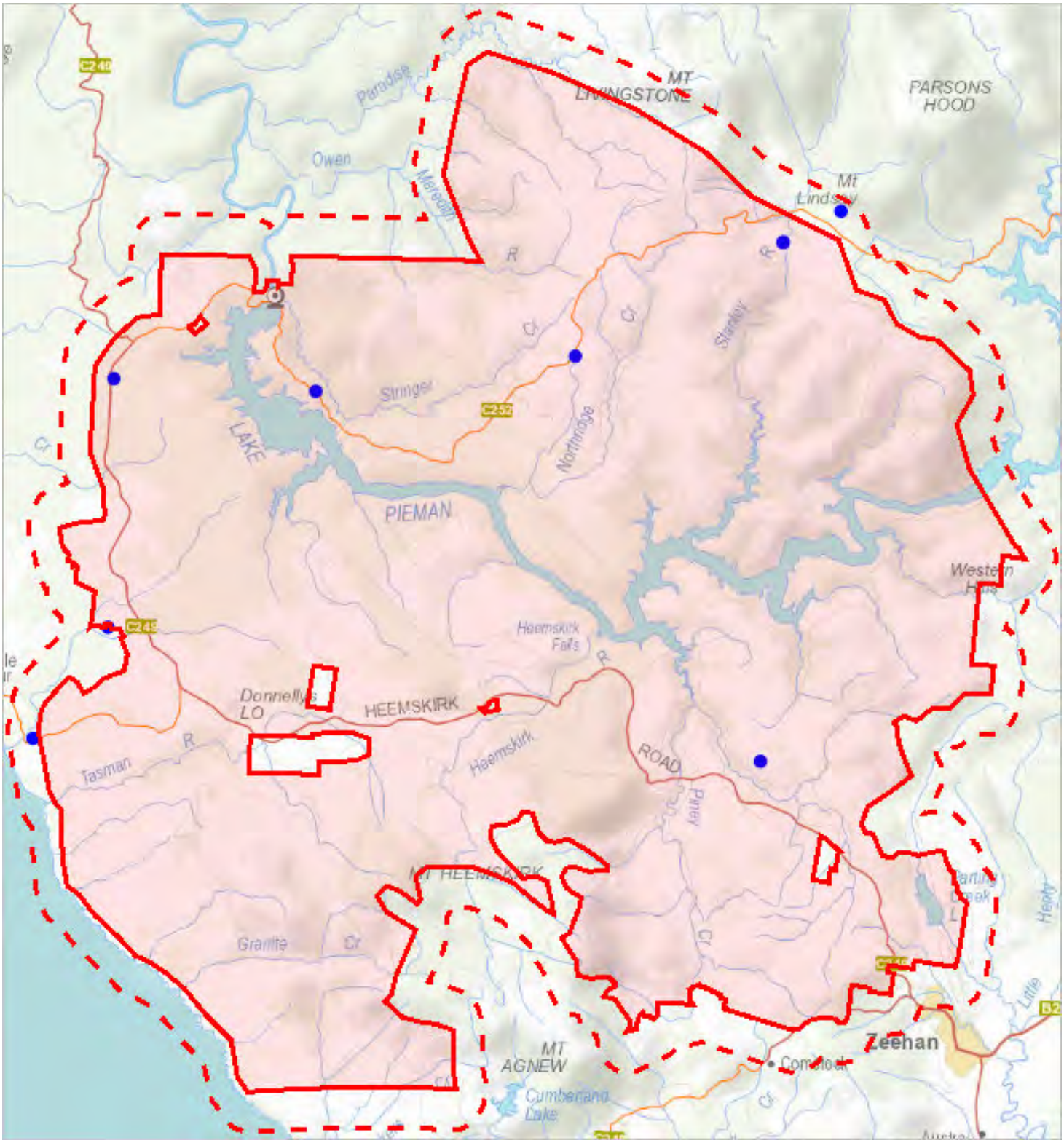
Reserves within 1000 metres

Name	Classification	Status	Area (HA)
	Informal Reserve on Permanent Timber Production Zone Land or STT managed land	Informal Reserve	7.20732919
	Informal Reserve on Permanent Timber Production Zone Land or STT managed land	Informal Reserve	7.68572823
	Informal Reserve on Permanent Timber Production Zone Land or STT managed land	Informal Reserve	16.36455851
	Informal Reserve on Permanent Timber Production Zone Land or STT managed land	Informal Reserve	29.14340507
	Informal Reserve on Permanent Timber Production Zone Land or STT managed land	Informal Reserve	29.21840654
	Informal Reserve on Permanent Timber Production Zone Land or STT managed land	Informal Reserve	30.01879992
	Informal Reserve on Permanent Timber Production Zone Land or STT managed land	Informal Reserve	31.59431752
	Informal Reserve on Permanent Timber Production Zone Land or STT managed land	Informal Reserve	55.79967878
	Informal Reserve on Permanent Timber Production Zone Land or STT managed land	Informal Reserve	56.76274271
	Informal Reserve on Permanent Timber Production Zone Land or STT managed land	Informal Reserve	65.12034926
	Informal Reserve on Permanent Timber Production Zone Land or STT managed land	Informal Reserve	85.26835911
	Informal Reserve on Permanent Timber Production Zone Land or STT managed land	Informal Reserve	111.2871293
	Informal Reserve on Permanent Timber Production Zone Land or STT managed land	Informal Reserve	1582.20832118
	Informal Reserve on other public land	Informal Reserve	0.14013636
	Informal Reserve on other public land	Informal Reserve	0.21863518
	Informal Reserve on other public land	Informal Reserve	0.30970807
	Informal Reserve on other public land	Informal Reserve	0.5090632
	Informal Reserve on other public land	Informal Reserve	1.02813185
	Informal Reserve on other public land	Informal Reserve	1.54268183
	Informal Reserve on other public land	Informal Reserve	18.74422607
	Informal Reserve on other public land	Informal Reserve	34.29748657
	Informal Reserve on other public land	Informal Reserve	125.8009851

For more information about the Tasmanian Reserve Estate, please contact the Natural Values Science Services Branch.
Email: LandManagement.Enquiries@nre.tas.gov.au
Address: GPO Box 44, Hobart, Tasmania, Australia, 7000

Known biosecurity risks within 1000 meters

364809, 5386828



338040, 5358289

Please note that some layers may not display at all requested map scales

Known biosecurity risks within 1000 meters

Legend: Biosecurity Risk Species

- Point Verified
- Point Unverified
- Line Verified
- Line Unverified
- Polygon Verified
- Polygon Unverified

Legend: Hygiene infrastructure

- Location Point Verified
- Location Point Unverified
- Location Line Verified
- Location Line Unverified
- Location Polygon Verified
- Location Polygon Unverified

Legend: Cadastral Parcels

Known biosecurity risks within 1000 meters

Verified Species of biosecurity risk

Species Name	Common Name	Prescription	Observation Count	Last Recorded
Phytophthora cinnamomi	root rot or water mould		9	23-Mar-2017

Unverified Species of biosecurity risk

No unverified species of biosecurity risk found within 1000 metres

Generic Biosecurity Guidelines

The level and type of hygiene protocols required will vary depending on the tenure, activity and land use of the area. In all cases adhere to the land manager's biosecurity (hygiene) protocols. As a minimum always Check / Clean / Dry (Disinfect) clothing and equipment before trips and between sites within a trip as needed https://www.nre.tas.gov.au/invasive-species/weeds/weed-hygiene/keeping-it-clean-a-tasmanian-field-hygiene-manual

On Reserved land, the more remote, infrequently visited and undisturbed areas require tighter biosecurity measures.

In addition, where susceptible species and communities are known to occur, tighter biosecurity measures are required.

Apply controls relevant to the area / activity:

- Don't access sites infested with pathogen or weed species unless absolutely necessary. If it is necessary to visit, adopt high level hygiene protocols.
- Consider not accessing non-infested sites containing known susceptible species / communities. If it is necessary to visit, adopt high level hygiene protocols.
- Don't undertake activities that might spread pest / pathogen / weed species such as deliberately moving soil or water between areas.
- Modify / restrict activities to reduce the chance of spreading pest / pathogen / weed species e.g. avoid periods when weeds are seeding, avoid clothing/equipment that excessively collects soil and plant material e.g. Velcro, excessive tread on boots.
- Plan routes to visit clean (uninfested) sites prior to dirty (infested) sites. Do not travel through infested areas when moving between sites.
- Minimise the movement of soil, water, plant material and hitchhiking wildlife between areas by using the Check / Clean / Dry (Disinfect when drying is not possible) procedure for all clothing, footwear, equipment, hand tools and vehicles https://www.nre.tas.gov.au/invasive-species/weeds/weed-hygiene
- Neoprene and netting can take 48 hours to dry, use non-porous gear wherever possible.
- Use walking track boot wash stations where available.
- Keep a hygiene kit in the vehicle that includes a scrubbing brush, boot pick, and disinfectant https://www.nre.tas.gov.au/invasive-species/weeds/weed-hygiene/keeping-it-clean-a-tasmanian-field-hygiene-manual
- Dispose of all freshwater away from natural water bodies e.g. do not empty water into streams or ponds.
- Dispose of used disinfectant ideally in town though a treatment or septic system. Always keep disinfectant well away from natural water systems.
- Securely contain any high risk pest / pathogen / weed species that must be collected and moved e.g. biological samples.

Hygiene Infrastructure

No known hygiene infrastructure found within 1000 metres

Appendix 3: EPBC Act Protected Matters Report (11th May 2023)

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 11-May-2023

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	1
Wetlands of International Importance (Ramsar	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	1
Listed Threatened Ecological Communities:	4
Listed Threatened Species:	53
Listed Migratory Species:	39

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at https://www.dcceew.gov.au/parks-heritage/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	59
Whales and Other Cetaceans:	12
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	10
Regional Forest Agreements:	1
Nationally Important Wetlands:	None
EPBC Act Referrals:	13
Key Ecological Features (Marine):	None
Biologically Important Areas:	18
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

National Heritage Places [Resource Information]

Name	State	Legal Status	Buffer Status
Indigenous			
Western Tasmania Aboriginal Cultural Landscape	TAS	Listed place	In buffer area only

Commonwealth Marine Area [Resource Information]

Approval is required for a proposed activity that is located within the Commonwealth Marine Area which has, will have, or is likely to have a significant impact on the environment. Approval may be required for a proposed action taken outside a Commonwealth Marine Area but which has, may have or is likely to have a significant impact on the environment in the Commonwealth Marine Area.

Feature Name	Buffer Status
EEZ and Territorial Sea	In buffer area only

Listed Threatened Ecological Communities [Resource Information]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.
Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text	Buffer Status
Alpine Sphagnum Bogs and Associated Fens	Endangered	Community likely to occur within area	In feature area
Giant Kelp Marine Forests of South East Australia	Endangered	Community may occur within area	In feature area
Tasmanian Forests and Woodlands dominated by black gum or Brookers gum (Eucalyptus ovata / E. brookeriana)	Critically Endangered	Community likely to occur within area	In feature area
Tasmanian white gum (Eucalyptus viminalis) wet forest	Critically Endangered	Community likely to occur within area	In feature area

Listed Threatened Species [Resource Information]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.
Number is the current name ID.

Scientific Name	Threatened Category	Presence Text	Buffer Status
BIRD			
Aquila audax fleayi			
Tasmanian Wedge-tailed Eagle, Wedge-tailed Eagle (Tasmanian) [64435]	Endangered	Breeding likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat may occur within area	In feature area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat may occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
Ceyx azureus diemenensis Tasmanian Azure Kingfisher [25977]	Endangered	Breeding known to occur within area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea antipodensis gibsoni Gibson's Albatross [82270]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Fregetta grallaria grallaria White-bellied Storm-Petrel (Tasman Sea), White-bellied Storm-Petrel (Australasian) [64438]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area	In feature area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
Limosa lapponica baueri Nunivak Bar-tailed Godwit, Western Alaskan Bar-tailed Godwit [86380]	Vulnerable	Species or species habitat may occur within area	In feature area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In feature area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Neophema chrysogaster Orange-bellied Parrot [747]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat known to occur within area	In feature area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Pterodroma leucoptera leucoptera Gould's Petrel, Australian Gould's Petrel [26033]	Endangered	Species or species habitat may occur within area	In feature area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Breeding likely to occur within area	In feature area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche bulleri platei Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area	In feature area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Thalassarche salvini			
Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche steadi			
White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
Thinornis cucullatus cucullatus			
Eastern Hooded Plover, Eastern Hooded Plover [90381]	Vulnerable	Species or species habitat known to occur within area	In feature area
Tyto novaehollandiae castanops (Tasmanian population)			
Masked Owl (Tasmanian) [67051]	Vulnerable	Species or species habitat known to occur within area	In feature area
FISH			
Prototroctes maraena			
Australian Grayling [26179]	Vulnerable	Species or species habitat known to occur within area	In feature area
Seriolella brama			
Blue Warehou [69374]	Conservation Dependent	Species or species habitat known to occur within area	In feature area
Thunnus maccoyii			
Southern Bluefin Tuna [69402]	Conservation Dependent	Species or species habitat likely to occur within area	In feature area
MAMMAL			
Balaenoptera borealis			
Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Balaenoptera musculus			
Blue Whale [36]	Endangered	Species or species habitat likely to occur within area	In feature area
Balaenoptera physalus			
Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Dasyurus maculatus maculatus (Tasmanian population)]			
Spotted-tail Quoll, Spot-tailed Quoll, Tiger Quoll (Tasmanian population) [75183]	Vulnerable	Species or species habitat known to occur within area	In feature area
[Eubalaena australis]			
Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area	In feature area
[Sarcophilus harrisii]			
Tasmanian Devil [299]	Endangered	Species or species habitat likely to occur within area	In feature area
PLANT			
[Caladenia dienema]			
Windswept Spider-orchid [64858]	Endangered	Species or species habitat may occur within area	In feature area
[Epacris glabella]			
Funnel Heath, Smooth Heath [24010]	Endangered	Species or species habitat known to occur within area	In feature area
[Hiya distans listed as Hypolepis distans]			
Scrambling Ground-fern [92548]	Endangered	Species or species habitat may occur within area	In feature area
[Pseudocephalozia paludicola]			
Alpine Leafy Liverwort [66441]	Vulnerable	Species or species habitat known to occur within area	In feature area
[Pterostylis ziegeleri]			
Grassland Greenhood, Cape Portland Greenhood [64971]	Vulnerable	Species or species habitat may occur within area	In feature area
REPTILE			
[Chelonia mydas]			
Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area	In buffer area only
SHARK			
[Carcharodon carcharias]			
White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area	In feature area
[Galeorhinus galeus]			
School Shark, Eastern School Shark, Snapper Shark, Tope, Soupfin Shark [68453]	Conservation Dependent	Species or species habitat may occur within area	In feature area

Listed Migratory Species			[Resource Information]
Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
Ardenna carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area	In feature area
Ardenna grisea Sooty Shearwater [82651]		Species or species habitat likely to occur within area	In feature area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In feature area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In feature area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area	In feature area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
Migratory Marine Species			
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat likely to occur within area	In feature area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour may occur within area	In feature area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area	In feature area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Eubalaena australis as Balaena glacialis australis Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area	In feature area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat may occur within area	In feature area
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat likely to occur within area	In feature area
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat known to occur within area	In feature area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area	In buffer area only
Migratory Terrestrial Species			
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Myiagra cyanoleuca			
Satin Flycatcher [612]		Species or species habitat likely to occur within area	In feature area
Migratory Wetlands Species			
Actitis hypoleucos			
Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
Calidris acuminata			
Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area	In feature area
Calidris canutus			
Red Knot, Knot [855]	Endangered	Species or species habitat may occur within area	In feature area
Calidris ferruginea			
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
Calidris melanotos			
Pectoral Sandpiper [858]		Species or species habitat may occur within area	In feature area
Charadrius leschenaultii			
Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Gallinago hardwickii			
Latham's Snipe, Japanese Snipe [863]		Species or species habitat known to occur within area	In feature area
Limosa lapponica			
Bar-tailed Godwit [844]		Species or species habitat may occur within area	In feature area

Other Matters Protected by the EPBC Act

Listed Marine Species			[Resource Information]
Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			

Scientific Name	Threatened Category	Presence Text	Buffer Status
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
Ardenna carneipes as Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area	In feature area
Ardenna grisea as Puffinus griseus Sooty Shearwater [82651]		Species or species habitat likely to occur within area	In feature area
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area	In feature area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat may occur within area overfly marine area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea antipodensis gibsoni as Diomedea gibsoni Gibson's Albatross [82270]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In feature area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat known to occur within area overfly marine area	In feature area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Breeding known to occur within area	In feature area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat may occur within area	In feature area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In feature area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat likely to occur within area overfly marine area	In feature area
Neophema chrysogaster Orange-bellied Parrot [747]	Critically Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area
Pachyptila turtur Fairy Prion [1066]		Species or species habitat likely to occur within area	In feature area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Stercorarius skua as Catharacta skua Great Skua [823]		Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche bulleri platei as Thalassarche sp. nov. Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area	In feature area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
Thinornis cucullatus as Thinornis rubricollis Hooded Plover, Hooded Dotterel [87735]		Species or species habitat known to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Thinornis cucullatus cucullatus as Thinornis rubricollis rubricollis](#)			
Eastern Hooded Plover, Eastern Hooded Plover [90381]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area
Fish			
[Heraldia nocturna](#)			
Upside-down Pipefish, Eastern Upside-down Pipefish, Eastern Upside-down Pipefish [66227]		Species or species habitat may occur within area	In feature area
[Hippocampus abdominalis](#)			
Big-belly Seahorse, Eastern Potbelly Seahorse, New Zealand Potbelly Seahorse [66233]		Species or species habitat may occur within area	In feature area
[Histiogamphelus briggsii](#)			
Crested Pipefish, Briggs' Crested Pipefish, Briggs' Pipefish [66242]		Species or species habitat may occur within area	In feature area
[Hypselognathus rostratus](#)			
Knifesnout Pipefish, Knife-snouted Pipefish [66245]		Species or species habitat may occur within area	In feature area
[Maroubra perserrata](#)			
Sawtooth Pipefish [66252]		Species or species habitat may occur within area	In feature area
[Mitotichthys semistriatus](#)			
Halfbanded Pipefish [66261]		Species or species habitat may occur within area	In feature area
[Notiocampus ruber](#)			
Red Pipefish [66265]		Species or species habitat may occur within area	In feature area
[Phyllopteryx taeniolatus](#)			
Common Seadragon, Weedy Seadragon [66268]		Species or species habitat may occur within area	In feature area
[Pugnaso curtirostris](#)			
Pugnose Pipefish, Pug-nosed Pipefish [66269]		Species or species habitat may occur within area	In feature area
[Solegnathus robustus](#)			
Robust Pipehorse, Robust Spiny Pipehorse [66274]		Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Stigmatopora argus			
Spotted Pipefish, Gulf Pipefish, Peacock Pipefish [66276]		Species or species habitat may occur within area	In feature area
Stigmatopora nigra			
Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area	In feature area
Urocampus carinirostris			
Hairy Pipefish [66282]		Species or species habitat may occur within area	In feature area
Vanacampus phillipi			
Port Phillip Pipefish [66284]		Species or species habitat may occur within area	In feature area
Vanacampus poecilolaemus			
Longsnout Pipefish, Australian Long-snout Pipefish, Long-snouted Pipefish [66285]		Species or species habitat may occur within area	In feature area
Mammal			
Arctocephalus forsteri			
Long-nosed Fur-seal, New Zealand Fur-seal [20]		Species or species habitat may occur within area	In feature area
Arctocephalus pusillus			
Australian Fur-seal, Australo-African Fur-seal [21]		Species or species habitat may occur within area	In feature area
Reptile			
Chelonia mydas			
Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area	In buffer area only

Whales and Other Cetaceans			[Resource Information]
Current Scientific Name	Status	Type of Presence	Buffer Status
Mammal			
Balaenoptera acutorostrata			
Minke Whale [33]		Species or species habitat may occur within area	In feature area
Balaenoptera borealis			
Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only

Current Scientific Name	Status	Type of Presence	Buffer Status
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat likely to occur within area	In feature area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour may occur within area	In feature area
Delphinus delphis Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area	In feature area
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area	In feature area
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area	In feature area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat may occur within area	In feature area
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat known to occur within area	In feature area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area	In buffer area only
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area	In feature area

Extra Information

State and Territory Reserves [Resource Information]

Protected Area Name	Reserve Type	State	Buffer Status
Bernafai Ridge	Conservation Area	TAS	In buffer area only
Crotty Ridge	Regional Reserve	TAS	In feature area
Four Mile Beach	Regional Reserve	TAS	In buffer area only
Lake Pieman	Regional Reserve	TAS	In buffer area only
Meredith Range	Regional Reserve	TAS	In feature area
Mount Heemskirk	Regional Reserve	TAS	In feature area
Ocean Beach	Conservation Area	TAS	In buffer area only
Parting Creek	Regional Reserve	TAS	In feature area
Pieman River	State Reserve	TAS	In feature area
Trial Harbour	State Reserve	TAS	In buffer area only

Regional Forest Agreements [Resource Information]

Note that all areas with completed RFAs have been included.

RFA Name	State	Buffer Status
Tasmania RFA	Tasmania	In feature area

EPBC Act Referrals [Resource Information]

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Venture Minerals Mt Lindsay Tin-tungsten-magnetite-copper Mine Project	2021/9132		Assessment	In feature area
Controlled action				
DSO Hematite Mine	2012/6339	Controlled Action	Post-Approval	In buffer area only
DSO Hematite Mine, Livingstone	2012/6342	Controlled Action	Completed	In feature area
Heemskirk Windfarm Development	2002/678	Controlled Action	Completed	In feature area
Mount Lindsay tin-tungsten-magnetite-copper mine	2011/6178	Controlled Action	Completed	In feature area
Not controlled action				
2D seismic survey, Petroleum Exploration Permit Area T/36P	2004/1787	Not Controlled Action	Completed	In feature area

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action				
Capture of Juvenile Tasmanian Devils for Conservation Purposes	2007/3261	Not Controlled Action	Completed	In feature area
Capture of Tasmanian Devils from Disease-Free Areas	2007/3883	Not Controlled Action	Completed	In feature area
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area
Tenth Legion magnetite open pit mining project, Tas	2014/7165	Not Controlled Action	Completed	In feature area
Not controlled action (particular manner)				
Granville Wind Farm, TAS	2012/6585	Not Controlled Action (Particular Manner)	Post-Approval	In feature area

Referral decision				
Livingstone DSO Hematite Mine Project	2021/9131	Referral Decision	Referral Publication	In feature area
Tenth Legion Mine Western Tasmania	2021/9017	Referral Decision	Referral Publication	In feature area

Biologically Important Areas

Scientific Name	Behaviour	Presence	Buffer Status
Seabirds			
Ardenna tenuirostris Short-tailed Shearwater [82652]	Breeding	Known to occur	In buffer area only
Ardenna tenuirostris Short-tailed Shearwater [82652]	Foraging	Known to occur	In feature area
Diomedea exulans (sensu lato) Wandering Albatross [1073]	Foraging	Known to occur	In buffer area only
Diomedea exulans antipodensis Antipodean Albatross [82269]	Foraging	Known to occur	In buffer area only
Pelecanoides urinatrix Common Diving-petrel [1018]	Foraging	Known to occur	In feature area
Pterodroma mollis Soft-plumaged Petrel [1036]	Foraging	Known to occur	In feature area

Scientific Name	Behaviour	Presence	Buffer Status
Thalassarche bulleri Bullers Albatross [64460]	Foraging	Known to occur	In buffer area only
Thalassarche cauta cauta Shy Albatross [82345]	Foraging likely	Likely to occur	In feature area
Thalassarche chlororhynchos bassi Indian Yellow-nosed Albatross [85249]	Foraging	Known to occur	In buffer area only
Thalassarche melanophris Black-browed Albatross [66472]	Foraging	Known to occur	In buffer area only
Thalassarche melanophris impavida Campbell Albatross [82449]	Foraging	Known to occur	In buffer area only
Sharks			
Carcharodon carcharias White Shark [64470]	Distribution	Known to occur	In buffer area only
Carcharodon carcharias White Shark [64470]	Distribution (low density)	Likely to occur	In buffer area only
Carcharodon carcharias White Shark [64470]	Known distribution	Known to occur	In buffer area only
Whales			
Balaenoptera musculus brevicauda Pygmy Blue Whale [81317]	Distribution	Known to occur	In feature area
Balaenoptera musculus brevicauda Pygmy Blue Whale [81317]	Foraging	Likely to be present	In feature area
Eubalaena australis Southern Right Whale [40]	Connecting habitat	Known to occur	In feature area
Eubalaena australis Southern Right Whale [40]	Known core range	Known to occur	In feature area

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact us page.

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Appendix C Whaleback Ridge Renewable Energy Project Bird and Bat Assessments

Whaleback Ridge Wind Farm

Bird and Bat Assessments 2021–2022

Prepared for
Westcoast Renewable Energy Pty Ltd

August 2023
Report No. 20209.2 (1.3)

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1. Executive summary

Westcoast Renewable Energy Pty Ltd (WRE) engaged Nature Advisory Pty Ltd (Nature Advisory) to conduct bird and bat surveys for the proposed Whaleback Ridge Wind Farm on the west coast of Tasmania. WRE is proposing a wind farm with up to 500 turbines generators and associated infrastructure is proposed for the study area.

The Whaleback Ridge Wind Farm is proposed to be located on the West Coast of Tasmania between Zeehan, Trial Harbour and Granville Harbour. The study area is located within Mount Heemskirk Regional Reserve, Meredith Range Regional Reserve and heathland north and south of Pieman Lake. Trial Harbour is located to the south of the study area, on the coast, while the town of Zeehan occurs to the south-east. Mount Heemskirk, a granitic mountain some 700 metres above sea level, lies to the south of the study area.

The study area is dominated by Buttongrass moorland with areas of heathy vegetation and Smithton Peppermint (*Eucalyptus nitida*) forest within the gullies interspersing the higher plateaus of Buttongrass moorland. Lake Pieman is located in the centre of the site and larger woodland areas occur adjacent to the north and east of the site.

WRE selected the site for a number of reasons including the anticipated low risk of impacts to avifauna. Site selection was informed by previous studies of the adjacent Granville Harbour Wind Farm, Heemskirk Wind Farm and a general understanding that the main soil and vegetation types in the area were not very likely to provide high quality habitat for threatened, diverse or abundant bird life. In 2020 WRE engaged Nature Advisory to commence bird and bat surveys to provide a detailed understanding of the avifauna utilising the area so that early planning and design for the project could avoid, minimise or mitigate the risk of impacts where possible.

This report details the survey work carried out between 2021 and 2022. The survey work included four avifauna investigations over two seasons including bird utilisation surveys (BUS), targeted raptor surveys, bat surveys and targeted surveys for Orange-bellied Parrot.

The bird utilisation surveys found that the number of species (diversity) was very low compared to other wind farms in Tasmania, likely due to the homogenous structure of the main vegetation type, buttongrass moorland. The surveys also found that the overall density of bird life was very low with the relative abundance of birds the lowest ever recorded by Nature Advisory compared to other wind farms in Tasmania or Mainland Australia. Of the birds observed during the bird utilisation survey the majority (more than 92%) were recorded flying below the Rotor Swept Area (RSA) of the proposed turbines demonstrating that the majority of bird species utilising the area are unlikely to be at risk of collision with operational turbines.

Three threatened bird species were observed during the fixed point counts of the bird utilisation surveys being the White-throated Needletail (*Hirundapus caudacutus caudacutus)* listed as Vulnerable under the Commonwealth *Environmental Protection of Biodiversity and Conservation Act 1999 (EPBC Act),* Blue-winged Parrot *(Neophema chrysostoma)* listed as vulnerable under the EPBC Act and the Tasmanian Wedge-tailed Eagle *(Aquila audax fleayi)*, listed as endangered under the EPBC Act and the Tasmanian *Threatened Species Conservation Act 1995*.

The White-throated Needletail is a trans-equatorial migrant to Tasmania and their risk of mortality from collision with turbines is considered a low severity threat given their presence in Southern Tasmania is only for a short period of time and collision affecting only a small number of birds. The observations made of the White-throated Needletails in the study area were during the autumn

surveys which is consistent with the species anticipated peak presence in Tasmania, generally occurring for a short time during February and March.

The Tasmanian Wedge-tailed Eagle observations were considered very low particularly in comparison to other operating wind farms. During the targeted raptor surveys only four flights of one or two birds were observed within the proposed wind farm site in the autumn survey and one flight of one bird in the wind farm site during the summer survey, with an additional eight incidental observations of one or two birds (in-between surveys) in autumn and one incidental observation of two birds in summer 2022. Utilisation rates for Wedge-tailed Eagles on the wind farm site was very low which is consistent with results of the aerial nest surveys conducted May/June 2022 where no nests were found in the proposed wind farm area (Mooney 2022).

Multiple targeted Orange-bellied Parrot surveys along the coast and up to 5km inland were conducted over two years during the period of the parrot's northerly migration to mainland Australia. One Orange-bellied Parrot was observed on the coastline of the study area. This is consistent with data collected for Granville Harbour Wind Farm, Heemskirk Wind Farm and the surrounding historical surveys where observations suggest that few if any Orange-bellied Parrots migrate beyond 150m meters from coastal waters along this section of coastline. A 1.5km turbine exclusion zone from the coast has been proposed by WRE as a precaution to further minimise risk.

Bat surveys were undertaken by placing songmeters during extended periods in Autumn 2021 and spring/summer 2021 recording calls of six species and two species complexes. All of the recorded bat calls were from common, secure and widespread species that occur in farmland and woodland habitats throughout Tasmania.

The key conclusions and recommendations of the avifauna surveys particularly in relation to observations of threatened species are:

- Species diversity and abundance of birds was very low during both bird utilisation surveys (autumn and summer) with predominantly heathland adapted bird species being observed at the wind farm site.
- The habitat at Whaleback Ridge Wind Farm does not support high densities of diverse or threatened avifauna.
- Wedge-tailed Eagles utilising Whaleback Ridge Wind Farm are in very low numbers with no nests identified in the study area.
- The two seasons of Orange-bellied Parrot surveys did not find any Orange-bellied parrots beyond 50m of the coastline. A 1.5km coastal turbine exclusion zone has been established to ensure the Orange-bellied Parrot migration path along the coast is not at risk from turbine collision.
- All bat species recorded during the survey were common species, mostly known to fly close to the ground or within canopy heights and at low risk of collision impact.

2. Introduction

Westcoast Renewable Energy Pty Ltd (WRE) engaged Nature Advisory Pty Ltd (Nature Advisory) to conduct bird and bat surveys for the proposed Whaleback Ridge Wind Farm on the west coast of Tasmania, proposing a wind farm with up to 500 turbines. The specific area investigated, referred to herein as the 'study area', comprised about 400 square kilometres between Zeehan and Granville Harbour. Nature Advisory also prepared a Desktop Flora and Fauna Assessment to identify flora and fauna species as well as listed ecological communities that could be susceptible to impacts from the project (Nature Advisory 2023).

Up to 500 turbines are proposed to be built, but the final number will depend on the generating capacity of the Wind Turbine Generators (WTG) selected. The currently proposed turbine dimensions comprise a turbine blade diameter of 155 metres and a tower height of 165 metres, resulting in a Rotor Swept Area height (RSA) from 87.5 metres to 242.5 metres above ground.

This investigation was commissioned to assist with informing the layout of the proposed wind farm and provide information for a Major Project Proposal an EPBC Act Referral. This report outlines any implications under relevant national, state and local legislation and policy frameworks.

Specifically, the scope of the investigation included the following:

- Bird Utilisation Surveys (BUS);
- Raptor Surveys;
- Orange-bellied Parrot (OBP) surveys; and
- Bat surveys.

This report is divided into the following sections.

Section 3 details the methods and results of the bird utilisation surveys.

Section 4 provides information on the methodology and results of the raptor surveys.

Section 5 presents the methods and results of the targeted surveys for the Orange-bellied Parrot.

Section 6 provides details on the methodology and results of the bat surveys.

Section 7 discusses the conclusions and recommendations for the proposed wind farm.

This investigation was undertaken by a team from Nature Advisory comprising Khalid Al-Dabbagh (Senior Zoologist), Peter Lansley (Senior Zoologist), Curtis Doughty (Senior Zoologist), Andrew McVinish (Zoologist), Guille Mayor (Zoologist), Amy Tipton (Zoologist), Emma Wagner (Senior GIS Analyst), Dr Inga Kulik (Senior Ecologist and Project Manager/Director) and Brett Lane (Managing Director).

3. Bird Utilisation Survey

3.1. Introduction

The bird utilisation surveys were undertaken consistent with the requirements for a "Level One" bird risk assessment in accordance with Best Practice Guidelines for Wind Energy Developments in Australia issued by the Clean Energy Council (2018).

The current report provides the results of two surveys, namely, autumn 2021 (3th to 13th March 2021) and summer 2022 surveys (19th to 26th January 2022).

3.2. Site description

The wind farm is proposed to be located on the West Coast of Tasmania between Zeehan, Trial Harbour and Granville Harbour. The proposed study areas and concept location of the wind turbines have been selected so that no clearing of native trees will be required for the construction of turbines.

The study area is located within Mount Heemskirk Regional Reserve, Meredith Range Regional Reserve and heathland north and south of Pieman Lake and was divided into two major sections to make it possible for two zoologists to undertake the Bus Utilisation Surveys (BUS) within reasonable time. The two sections were:

- Section 1 – North of Lake Pieman extending north and south across Pieman Road; and
- Section 2 – South of Lake Pieman between Granville Harbour, Trail Harbour and Zeehan, extending mainly north and south of Heemskirk Road.

The study area is dominated by Buttongrass moorland (MBU) with areas of heathy vegetation and Smithton Peppermint (*Eucalyptus nitida*) forest within the gullies interspersing the higher plateaus of Buttongrass moorland. Lake Pieman separates the sites and larger woodland areas are located adjacent to the north and east of the site.

The Natural Values Atlas (DPIPWE) identifies that seven Vegetation Groups occur within the study area. These are:

- Moorland, sedgeland and rushland (most of the study area)
- Wet eucalypt forest and woodland (within gullies)
- Rainforest and related scrub (within gullies and lower lying areas)
- Scrub, heathland and coastal complexes (closer to the coast and in gullies)
- Dry eucalypt forest and woodland (smaller areas on ridges)
- Non eucalypt forest and woodland (one very small area in the northeast)
- Other natural environments (Lake Pieman)
- Modified land (dams, quarries, etc)

Below is a representative view of the study area on which both of the BUS and raptor surveys were undertaken (Photograph 1).

Photograph 1: Typical Buttongrass moorland habitat at the proposed Whaleback Ridge Wind Farm

3.3. Methods

The method used for the bird utilisaton surveys was based on the standards for assessing the risks to birds from wind farms in Australia, outlined in the "Best Practice Guidelines for the Implementation of Wind Energy Projects in Australia" (Clean Energy Council 2018).

The bird utilisation survey is the most commonly used method for generating quantitative data on bird use at a proposed wind farm site. The results of bird utilisation surveys provide a ranked abundance of species use of the site at varying heights, including wind turbine rotor swept area (RSA) height. The method provides the following information:

- Bird species (diversity) utilising the study area;
- The frequency of activity and relative density of birds on site;
- Flight patterns and heights in relation to wind turbine heights;
- The broad distribution of bird species across the wind farm site.

Two pre-construction bird utilisation surveys were undertaken by Nature Advisory to account for seasonal differences in bird activity and migration. The current report comprises the combined results of the autumn period of 2021 and the summer period of 2022.

The two bird utilisaton surveys were undertaken by experienced zoologists and were designed to collect baseline data to allow for bird utilisation comparisons with post-construction data (BACI design). The survey design has been reviewed by Symbolix (2020) and was concluded to be statistically robust and supports a BACI design.

3.3.1. Fixed-point count

The fixed-point count method involved an observer stationed at a survey point for 15 minutes to record the presence and activity of birds. The period of 15 minutes adopted in the bird utilisation surveys was considered adequate to generate representative data on the bird species in the area during the surveys.

During the 15 minutes, all bird species and numbers of individual birds observed within 200 metres were recorded. The species, the number of birds and the height of the bird when first observed was documented. For species of concern (threatened species, raptors and waterbirds), the minimum and maximum heights were recorded.

Flight height is then categorised as below, at or above RSA height.

A = Below RSA (< 87.5 metres above ground)

B = At RSA (87.5 to 242.5 metres above ground)

C = Above RSA (> 242.5 metres above ground)

A total of 20 fixed survey points were established. Eighteen were considered impact points and were located within the wind farm area, and two were reference points (R1 and R2) and located outside the wind farm site in habitat that, as closely as possible, resembles those of the impact points (Figure 1). During the survey, eight replicate counts were taken at each survey point. Counts were taken at different times of the day to allow for time-of-day differences in bird movements and activity.

The wind farm was divided into two sections. The southern section (south of the Pieman Lake) included the points 1, 3, 5, 6, 7, 4, 8, 9, 10, 11; and the northern section (north of the Pieman Lake), including the points 2, 14, 15, 16, R1, 17, 18, 19, 20, R2. Two zoologists undertook the survey by working concurrently and dividing the effort between them. Surveys at each section lasted four days, with a total effort of eight days by the two zoologists at each section, and consequently 16 days of survey effort over the entire wind farm per survey period.

Table 1 below provides an example of when each point was counted during a survey period. Scheduling ensured that all points were visited equally at different times of day to allow for time-of-day differences in bird movements and activity. The schedule was not literally followed as changes had to be made due to access limitation and severe rainy days resulting in flooding of some access tracks during autumn 2021.

Table 1: Example of times when points were counted during a survey period

Days	Zoologist 1 - Week 1									
	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00
1	1	3	5	6	7	1	3	5	6	7
2	6	7	1	3	5	6	7	1	3	5
3	7	1	3	5	6	7	1	3	5	6
4	5	6	7	1	3	5	6	7	1	3
Days	Zoologist 2 - Week 1									
	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00
1	4	8	9	10	11	4	8	9	10	11
2	11	4	8	9	10	11	4	8	9	10
3	9	10	11	4	8	9	10	11	4	8
4	8	9	10	11	4	8	9	10	11	4
Days	Zoologist 1 - Week 2									
	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00
1	17	18	19	20	R2	17	18	19	20	R2
2	19	20	R2	17	18	19	20	R2	17	18
3	R2	17	18	19	20	R2	17	18	19	20
4	18	19	20	R2	17	18	19	20	R2	17
Days	Zoologist 2 - Week 2									
	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00
1	2	14	R1	15	16	2	14	R1	15	16

Days	Zoologist 1 - Week 1									
	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00
1	1	3	5	6	7	1	3	5	6	7
2	R1	15	16	2	14	R1	15	16	2	14
3	16	15	2	14	R1	15	16	2	14	15
4	14	R1	15	16	2	14	R1	15	16	2

Notes: R = Reference point

3.3.2. Locations of survey points

The survey points were distributed as evenly as possible across the wind farm (subject to access constraints) to maximise coverage in areas where wind turbines are likely to be sited (Figure 1). Impact points were positioned as far as possible on elevated ground, allowing a clear view in all directions.

Table 2 provides a description of the habitats associated with each survey point. The points were located in a selection of habitat types representative of those across the study area.

Table 2 Habitat descriptions for survey points.

BUS Points	Habitat Description
BUS 1	Along Granville Road among Buttongrass moorland on an elevated spot with some high tea trees and few small eucalypts along the road.
BUS 2	Very high point on the site. Buttongrass moorland with some heath. Sparse and short vegetation.
BUS 3	On top of a hill (trig hill) among Buttongrass moorland with some heath, a patch of large eucalypts and high growth of tee trees and melaleuca.
BUS 4	Buttongrass moorland, with some heathy species. Sparse and short vegetation. Non restricted views 360 degrees.
BUS 5	Buttongrass moorland with some heath, low and sparse vegetation. A gully nearby with some eucalypts. Was burnt in 2019 fires.
BUS 6	Buttongrass moorland with some heath, low and sparse vegetation.
BUS 7	Buttongrass moorland with some heath, low and sparse vegetation.
BUS 8	Buttongrass moorland on a small ridge (hill) with few eucalypt trees.
BUS 9	Buttongrass moorland dominated by tea-tree and Buttongrass. Some short eucalypt trees in gullies.
BUS 10	Located on top of hill. Buttongrass moorland, heath in gullies down the hill, eucalypt woodland in low lying areas surrounding hill.
BUS 11	On top of hill. Buttongrass moorland, very short and sparse, small rocks present.
BUS 12 (R1)	On top of a hill. Buttongrass moorland dominated by tea-tree and Buttongrass, some small eucalypt trees but mainly treeless.
BUS 13 (R2)	On top of a hill. Buttongrass moorland dominated by tea-tree, heath and Buttongrass. Woodland nearby to the east.
BUS 14	On top of hill. Buttongrass moorland, with few low banksias along the slopes.
BUS 15	Buttongrass flat ridge, no trees in the counting area.
BUS 16	Buttongrass flat ridge, no trees in the counting area.
BUS 17	On top of hill among Buttongrass moorland with heath. No large trees in the surroundings
BUS 18	On top of hill among Buttongrass moorland with heath. No large trees in the surroundings.
BUS 19	On top of hill among Buttongrass moorland with heath. No large trees in the surroundings.

BUS Points	Habitat Description
BUS 20	On top of hill among Buttongrass moorland with heath. Patches of woodlands surrounding the point at about 200 m away.

3.3.3. Incidental observations

In addition to observations during fixed-point counts, incidental observations of birds of concern (threatened species and raptors) were made whilst travelling throughout the study area. Notes were also made on birds observed in remnant woodlands and any early morning and evening roosting movements. Emphasis was placed on observing birds that were moving through the study area at RSA height.

3.3.4. Limitations

The bird utilisation survey was undertaken to collect a range of data and include migratory birds that may only occur at certain times of the year.

The flight height data used for this assessment was generated from the height the bird was flying when the observer first sighted the bird. In some instances, the bird would then ascend or descend.

The visual estimation of bird flight heights depends on the experience of the observer. Nature Advisory ornithologists have years of experience undertaking BUS and raptor surveys estimating flight heights. Usually, reference heights or clues from objects in the field are used to estimate heights, such as tree canopy heights, fence posts and telegraph poles. The margin of error in such estimation is acceptable and a precautionary approach is applied for estimations of birds flying at greater heights. However, the majority of birds observed flew close to the ground, or within the tree canopies in their habitats.

The first bird utilisation survey was undertaken the first half of March 2021. A time considered an optimal time for BUS surveys, since at this time of year, most migratory bird species would be present in Tasmania. Therefore, the survey was appropriately timed for detecting most bird species likely to be present on the site.

The second bird utilisation survey was undertaken in January 2022. A time when the habitat (ridges) was undergoing a dry spell and bird movements were accordingly limited and representing conditions during the summer months.

The utilisation rates and species abundances recorded during the survey were considered to be representative of the site in summer and early autumn. They were also considered to provide a reasonable basis from which to assess the bird risks associated with the proposed Whaleback Ridge Wind Farm.

Figure 1: BUS survey points location

Project: Whaleback Ridge Renewable Energy Project
Client: Westcoast Renewable
Date: 2/11/2022

Legend
- Wind farm boundary
- Turbine exclusion zone
- BUS points

BUS 16
BUS 2
BUS 15
(R2)
BUS 17
BUS 14
BUS 18
(R1)
BUS 19
BUS 20
BUS 7
BUS 6
BUS 10
BUS 3
BUS 4
BUS 1
BUS 5
BUS 9
BUS 8
BUS 11

Tasman Sea
Granville Harbour
Trial Harbour
Zeehan
Renison Bell
Zeehan Recreation Reserve

N

Metres
0 1,600

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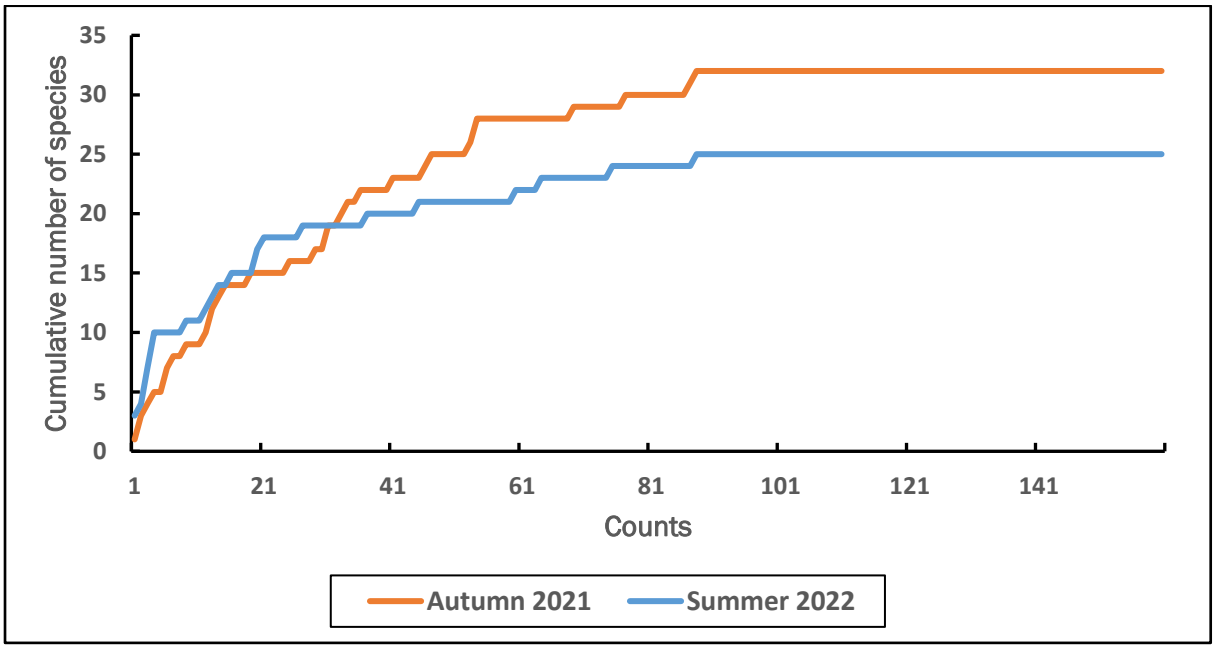
3.4. Results

3.4.1. Survey suitability

The cumulative number of species observed from consecutive impact survey points conducted during the autumn 2021 and summer 22 survey periods has been plotted in Figure 2.

Figure 2 revealed that the number of new species observed at the wind farm sites almost levelled off at approximately 40 counts, after which the occasional new species was found. Over 75% of species were found after 25% of the replicates were counted. The shape of the curve was remarkably similar, except for the number of species recorded between autumn and summer surveys. This suggested that the surveys collectively provided a representative picture of the diversity of bird species flying over the wind farm site during the survey period.

Figure 2: The cumulative number of bird species recorded during consecutive counts at impact points at Whaleback Ridge Wind Farm.



3.4.2. Species and abundance

A total of 39 species of birds were recorded at and near the proposed Whaleback Wind farm. The actual number of these bird species recorded at the impact points was lower, with 32 species recorded during autumn 2021, or 82% of all recorded species, and 28 species during summer 2022, or 72% of all birds (Table 3). A similar trend was recorded at the reference points with 13 and 8 species during autumn 2021 and summer 2022, respectively.

Species recorded were predominantly Buttongrass and Heathland adapted species with very few records of raptors. Some of the species present within the wind farm sites, such as Green Rosella, and honeyeaters, were mostly restricted to the gullies and hardly flew over the ridges where the observation points were located. This was more evident during the summer 2022 compared to autumn 2021 survey.

Table 3: Number of species recorded at observation sites

Season	Number of species at observation points	
	Impact	Reference
Autumn 21	32	13
Summer 22	28	8

Species diversity was low with the number of species counted at each of the impact points varying between the two seasons. In autumn 2021, the number of species recorded at the impact points ranged between 1 (at point 18) or 2 (at points 15, 16) to 15 species (at point 8), with 3 to 13 species recorded at the remaining sites; in summer 2022, species numbers ranged between 1 (at several points, namely: 2, 10, 15, 17, 18) to 7 species (at point 3) and 8 species (at point 8), with 2 to 6 species recorded at the remaining sites (Table 3).

Species diversity (richness) was very low and consistent at the impact survey points. Analysis of variance or ANOVA was used to compare the means of bird numbers and numbers of species between the two observations seasons. There were no significant differences between number of birds counted at the observation points during autumn 2021 (Single factor ANOVA, $F = 0.8467$, $P<0.05$) or summer 2022 (Single factor ANOVA, $F = 0.8342$, $P<0.05$). Similarly, there were no significant differences between species diversity (number of species) between the two seasons of the surveys (Single factor ANOVA, $F = 0.418265$, $P<0.05$).

In general, the number of species (diversity) found utilising the observation points (the entire ridge) was very low compared to other wind farms in Tasmania (Nature Advisory; unpubl. Data). The low species diversity is most likely related to the habitat structure, where heathland's homogenous structure offers little habitat varieties that could attract more species than the ones recorded. Species diversity could also be affected by prevailing weather conditions; during summer 2022, the wind farm ridges were very dry and lacked water pools or small rain accumulated ponds compared to autumn 2021, and hence the lower diversity, though not significantly different, between the two seasons.

The species observed utilising the impact and reference observation points, their abundance and height distribution are summarised in Table 4 (Impact points) and Table 5 (Reference points). The detailed data from each of the 18 impact and two reference sites are presented in Appendix 1. Both tables include a list of the species observed during the BUS as well as the number of individuals per species recorded at each of the three height zones (below 87.5 m [A], at 87.5–242.5 [B] and above 242.5 m [C] RSA height). During BUS, none of the birds were observed flying above RSA height.

The relative abundance of birds, roughly estimated as the total number of individual birds seen at the 18 impact observation points during the formal BUS counts, was very low, particularly when compared to numbers recorded at other wind farms with similar habitats in Tasmania (Table 4). Notwithstanding the paucity of bird on the ridges, numbers recorded at almost all the observation points was clearly influenced by availability of food and water. During summer 2022 survey, bird numbers were less than half that recorded during autumn 2021 survey (Table 4). The poor bird life in summer 2022 was most likely driven by lack of enough water on the ridges and lack of flowering plants, such as banksias which provide nectar for honeyeaters.

On a seasonal basis, the abundance of birds (number individuals counted at each point) varied between the observation points. In autumn 2021, the number of individuals counted varied between 1 bird at point no. 18 to 69 birds at point 3, while these numbers varied between 1 bird at point 18 to 37 birds at point 3 during the summer 2022 survey (see Appendix 1). Within seasons, abundance was not significantly different between the observation points (Single factor ANOVA, autumn 2021, F= 1.4790; P > 0.05, summer 2022, F= 0.7230; P > 0.05). However, the single factor analysis for differences between the points during autumn 2021 excluded the records of a flock of the White-throated Needletail. The bird counts (BUS) coincided with the passage of a flock of the needletails flying over the wind farm ridges while in their usual travels over south Tasmania at this time of year.

Aside from the White-throated Needletail numbers counted in the autumn 2021 BUS, the bird abundance was relatively stable when compared between the seasons, and no significant difference was detected (Single factor ANOVA, F=1.8847; P> 0.05; not significant).

Table 4: Count and height distribution of bird species at impact survey points

Species	Autumn 21		Summer 22		Totals			% Imp.
	A	B	A	B	A	B	Total	
White-throated Needletail	109	18	0	0	109	18	127	17.7
Crescent Honeyeater	104	0	14	0	118	0	118	16.5
Striated Fieldwren	27	0	48	0	75	0	75	10.5
Australian Pipit	27	0	17	0	44	0	44	6.1
Welcome Swallow	19	0	20	0	39	0	39	5.4
Tasmanian Thornbill	28	0	10	0	38	0	38	5.3
Yellow-throated Honeyeater	20	0	18	0	38	0	38	5.3
Superb Fairywren	21	0	10	0	31	0	31	4.3
Southern Emu-wren	10	0	20	0	30	0	30	4.2
Dusky Robin	15	0	6	0	21	0	21	2.9
Forest Raven	6	9	3	0	9	9	18	2.5
Tree Martin	15	0	3	0	18	0	18	2.5
Green Rosella	13	0	1	0	14	0	14	2.0
Beautiful Firetail	9	0	3	0	12	0	12	1.7
New Holland Honeyeater	10	0	1	0	11	0	11	1.5
Blue-winged Parrot	1	5	3	0	4	5	9	1.3
Grey Shrike-thrush	3	0	6	0	9	0	9	1.3
Ground Parrot	6	0	3	0	9	0	9	1.3
Brown Falcon	2	1	4	0	6	1	7	1.0
Eastern Spinebill	3	0	3	0	6	0	6	0.8
Yellow-tailed Black Cockatoo	2	2	2	0	4	2	6	0.8
Swamp Harrier	0	2	3	0	3	2	5	0.7
Tasmanian Scrubwren	4	0	1	0	5	0	5	0.7
Flame Robin	4	0	0	0	4	0	4	0.6
Black Currawong	2	0	1	0	3	0	3	0.4
European Goldfinch	1	0	2	0	3	0	3	0.4
Grey Fantail	3	0	0	0	3	0	3	0.4
Olive whistler	3	0	0	0	3	0	3	0.4

Species	Autumn 21		Summer 22		Totals			% Imp.
	A	B	A	B	A	B	Total	
Black-faced Cuckoo-shrike	0	0	2	0	2	0	2	0.3
Silvereye	2	0	0	0	2	0	2	0.3
Wedge-tailed Eagle	1	0	0	1	1	1	2	0.3
White-fronted Chat	0	0	2	0	2	0	2	0.3
Brown Goshawk	1	0	0	0	1	0	1	0.1
Brush Bronzewing	1	0	0	0	1	0	1	0.1
Collared Sparrowhawk	1	0	0	0	1	0	1	0.1
Total	473	37	206	1	679	38	717	100.0

Note: A = below RSA height; B = at RSA height; no birds were recorded above RSA height.

Table 5: Count and height distribution of bird species at Reference survey points

Birds	Autumn 2021		Summer 2022		Grand total			Percentage importance
	A	B	A	B	A	B	Tot.	
Crescent Honeyeater	36	0	4	0	40	0	40	41.6
Yellow-throated Honeyeater	9	0	0	0	9	0	9	9.4
Southern Emu-wren	7	0	1	0	8	0	8	8.3
Superb Fairywren	4	0	5	0	9	0	9	9.4
Australian Pipit	3	0	0	0	3	0	3	3.1
Green Rosella	3	0	2	0	5	0	5	5.2
Striated Fieldwren	3	0	3	0	6	0	6	6.3
Yellow-tailed Black-Cockatoo	3	0	0	0	3	0	3	3.1
Dusky Robin	2	0	0	0	2	0	2	2.1
Black Currawong	1	0	0	0	1	0	1	1.0
Flame Robin	1	0	0	0	1	0	1	1.0
Ground Parrot	1	0	1	0	2	0	2	2.1
Wedge-tailed Eagle	1	0	0	0	1	0	1	1.0
Grey Fantail	0	0	2	0	2	0	2	2.1
Tree Martin	0	0	4	0	4	0	4	4.2
Total	74	0	22	0	96	0	96	100.0

Note: A = below RSA height; B = At RSA height; No bird recorded above RSA height.

The five most common species at the impact and reference survey points are presented in Table 6 from most to least abundant. The five most common species recorded during both seasons at the impact survey points comprised over 60 percent of all birds and at the reference survey points comprised over 79 percent of all birds observed. The combined list of the dominant species (Table 4) is almost identical to autumn 2021 list, but less so compared to summer 2022 list. Dominant species utilising the wind farm ridge were almost the same throughout the year.

The species dominating the bird life at the wind farm site were a selection of heathland adapted species. Bird species dominating the reference sites were similar to those at the impact sites being mainly heathland adapted species.

The migratory White-throated Needletail (dominant in autumn 2021) was not recorded during the summer 2022 survey.

Table 6: Commonly recorded species at both impact and reference sites

Autumn 2021		Summer 2022	
Impact survey points	Reference survey points	Impact survey points	Reference survey points
White-throated Needletail	Crescent Honeyeater	Striated Fieldwren	Superb Fairywren
Crescent Honeyeater	Yellow-throated Honeyeater	Southern Emu-wren	Crescent Honeyeater
Tasmanian Thornbill	Southern Emu Wren	Welcome Swallow	Tree Martin
Striated Fieldwren	Superb Fairywren	Yellow-throated Honeyeater	Striated Fieldwren
Australian Pipit	Australian Pipit	Australian Pipit	Green Rosella

Table 7 summarises the distribution of bird numbers (relative abundance) and their height distribution among the survey points. The table also provides details of the density of birds (number of birds per hectare per hour) utilising the observation points.

The relative abundance of birds at the impact points was rather similar without important differences between the points. This trend reflected the similar habitat at the observation points; however, few of the points recorded slightly higher number of birds mainly due to presence of woodland trees within the counting area (for example, points 3 and 8).

The low abundance could be clearly seen in the low estimates of density (Table 7). The overall relative density (birds per hectare per hour calculated for combined seasons) varied between 0.08 to 4.26 birds per hectare per hour with an overall average for the whole windfarm estimated at 1.58 birds per hectare per hour. The relative abundance at Whaleback Ridge Wind farm is the lowest ever recorded by Nature Advisory compared to other wind farms in Tasmania or Mainland Australia (Nature Advisory; unpubl. data).

Table 7: Summary of the number, height distribution and density of bird at the impact and reference points.

Observation Sites	autumn 21		summer 22		Grand Total			Percentage importance	Density No./ha/hr
	A	B	A	B	A	B	Total		
1	47	17	23		68	19	87	12.1	3.46
2	16	1	4		20	1	21	2.9	0.84
3	57	12	37	1	94	13	107	14.9	4.26
4	27		16		43	0	43	6.0	1.71
5	19		7		26	0	26	3.6	1.03
6	42		17		59	0	59	8.2	2.35
7	23	2	18		41	2	43	6.0	1.71
8	46		33		79	0	79	11.0	3.14
9	29		5		34	0	34	4.7	1.35

Observation Sites	autumn 21		summer 22		Grand Total			Percentage importance	Density No./ha/hr
	A	B	A	B	A	B	Total		
10	37		3		40	0	40	5.6	1.59
11	25		16		41	0	41	5.7	1.63
14	24		3		27	0	27	3.8	1.07
15	18		2		20	0	20	2.8	0.80
16	22		4		26	0	26	3.6	1.03
17	7		2		9	0	9	1.3	0.36
18		1	1		1	1	2	0.3	0.08
19	14	3	3		17	3	20	2.8	0.80
20	19	2	12		31	2	33	4.6	1.31
Impact points	473	37	206	1	679	38	717	Av. density	1.58
R1	20		8		28	0	28	29.2	1.11
R2	54		14		68	0	68	70.8	2.70
Reference points	74	0	22	0	96	0	96	Av. density	1.91

Note: A = below RSA height; B = at RSA height; no birds were recorded above RSA height.

3.4.3. Flight Heights

Bird heights were classified as below (< 87.5 metres), at (87.5–242.5 metres) and above (> 242.5 metres) Rotor Swept Area (RSA) height.

A majority of birds were recorded flying below RSA heights. The percentage of birds recorded flying below, at, and above RSA heights at the impact sites were as follows:

Autumn 2021: 92.2% below, 7.8% at, and 0% above RSA height.

Summer 2022: 99.5% below, 0.5% at, and 0% above RSA height.

The detailed height distribution of birds over the wind farm site is shown in Figure 3. The height distribution confirms that most birds flew below RSA height or were either on the ground or in trees (from 1 to 20 metres height), therefore reducing collision risks between birds and operational wind turbines.

The most common birds recorded flying at RSA heights, comprised large birds such as Ravens and Raptors. In autumn 2021, several species were recorded, though in small numbers, flying at RSA height (Table 8). In summer 2022, a single Wedge-tailed Eagle was seen flying at RSA height. The paucity of birds flying at RSA height during the summer 2022 survey was mainly due to the lack of large birds flying over the wind farm site, either due to the dry condition on the ridges or being a migratory species, which would have already left Tasmania.

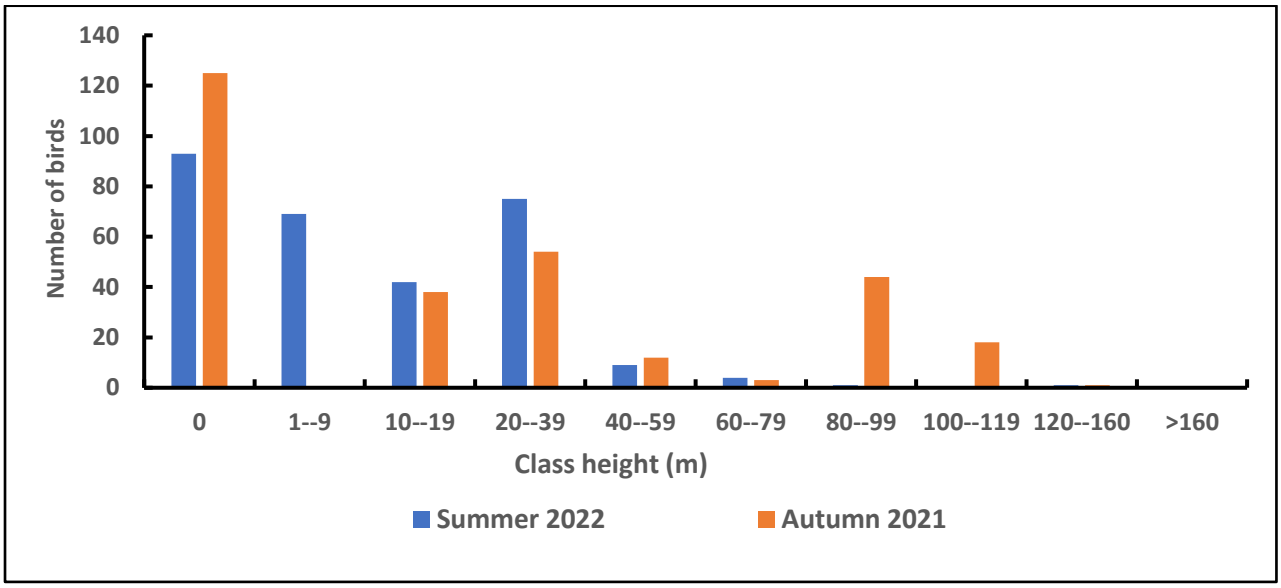
At the reference points, no birds were recorded flying at the RSA heights in both seasons of the surveys.

Table 8: Species flying at rotor swept area (RSA) at the impact sites during autumn 2021 BUS

Species flying at RSA	Birds flying at			Total observations	%	% RSA of
	A	B	C		At RSA	All Birds
White-throated Needletail	109*	18	0	127	48.6	3.8
Forest Raven	6	9	0	15	24.3	1.9
Blue-winged Parrot	1	5	0	6	16.2	1.1
Yellow-tailed Black-Cockatoo	2	2	0	4	10.8	0.4
Brown Falcon	2	1	0	3	8.1	0.2
Swamp Harrier	0	2	0	2	5.4	0.4
All Birds Total	473	37	0	510		7.8

Note: A = below RSA height; B = at RSA height; C = above RSA height.
** max. flock number at any single observation was 30 birds*

Figure 3: The height distribution of birds flying at the observation points



3.4.4. Birds of concern (Raptors and Waterbirds)

Five raptor species were recorded in low numbers during the fixed-point counts at impacts points (all five in autumn 2021, three in summer 2022), comprising 16 observations (8 in each season) in total (Table 9). One of the raptor species observed, namely the Tasmanian sub-species of the Wedge-tailed Eagle *(Aquila audax fleayi)* is listed as endangered under both the Commonwealth *Environment Protection of Biodiversity Conservation Act 1999* (EPBC Act) and the Tasmanian *Threatened Species Protection Act 1995* (TSP Act).

All five observed species were rather uncommon and recorded at only few occasions. The most common raptors at the wind farm were the Brown Falcon and the Swamp Harrier, a small number of which were seen flying at RSA height (Table 9). The Wedge-tailed Eagle was recorded once during autumn 2021 flying below RSA height, and again once during summer 2022 flying at RSA height. These two observations constituted 0.2 percent and 0.5 percent of all birds observed flying at RSA heights.

At both of the two survey seasons, no species of waterbirds were recorded at the wind farm site during BUS. Most of the large waterbirds, such as ducks and herons, were restricted in their presence along the coastal areas.

Table 9: Numbers and percentage of birds of prey observations

Species of raptors	Autumn raptors					Summer raptors				
	A	B	Total	% of RSA birds	% RSA of all birds	A	B	Total	% of RSA birds	%RSA of all birds
Brown Falcon	2	1	3	2.7	0.2	4	0	4	0.0	0.0
Swamp Harrier	0	2	2	5.4	0.4	3	0	3	0.0	0.0
Wedge-tailed Eagle	1	0	1	0.0	0.0	0	1	1	100.0	0.5
Collared Sparrowhawk	1	0	1	0.0	0.0					
Brown Goshawk	1	0	1	0.0	0.0					
Total raptors	5	3	8	8.1	0.6	7	1	8	100	0.5
Total (all birds)	473	37	510			206	1	207		

Note: A = below RSA height; B = at RSA height.

3.4.5. Threatened and migratory species

The majority of birds found to utilise the study area were common, widespread birds. Three threatened bird species were observed during the fixed-point counts namely, **Blue-winged Parrot** with six individuals during autumn 2021 and three during summer 2022, **Wedge-tailed Eagle,** which was recorded only once in both seasons, and **White-throated Needletail** which was recorded in autumn 2021, but not in the summer 2022 survey during the formal BUS count. Two individuals were seen incidentally outside the wind farm study area in summer 2022.

Wedge-tailed Eagle

Tasmanian Wedge-tailed Eagle is listed as endangered under the Commonwealth EPBC Act and endangered under the Tasmanian *Threatened Species Protection Act 1995* (TSP Act). It is a distinct subspecies (*fleayi*) of the Wedge-tailed Eagle of Australia and southern New Guinea.

The Tasmanian Wedge-tailed Eagle is found throughout most of Tasmania and near shore islands and the Furneaux group (islands northeast of Tasmania). It is said to be more abundant in the north and east of the state (Marchant and Higgins 1993).

There were two observations of the Wedge-tailed Eagle during the two seasonal BUS (one observation per season, table 9), constituting a value of 0.04 eagle per hectare per hour (in each season) as a utilisation rate for the eagles over the wind farm site. This utilisation rate is considered very low in comparison with such rates in other operating wind farms. The eagles were not recorded at the neighbouring Granville Harbour Wind farm during BUS undertaken by Nature Advisory (formerly Brett Lane & Associates). Similarly, at Jim's Plain Wind farm (north-west Tasmania) with a similar Button-grass Heathland habitat, the eagles were only recorded once during four seasons of BUS. At other wind farms in Victoria and Southern South-east Australia, the rates varied between 0.01–0.44 eagles per hectare per hour (Nature Advisory; unpubl. Data).

Separate raptor surveys have been undertaken at the proposed Whaleback Ridge Wind Farm site and more information on the eagles is provided in Section 4 of this report.

Blue-winged Parrot

Blue-winged Parrots breed in hollow branches of eucalypts in Tasmania, coastal South Australia and southern Victoria. Before migrating from Tasmania in autumn, many birds congregate on saltmarshes and agricultural land before departing north, they occupy coastal, subcoastal and inland habitats ranging into semi-arid zones and inhabits grasslands, grassy woodlands and forest (Higgins 1999). They generally move in small flocks and while crossing open land they fly mostly at heights below 30 metres but occasionally at RSA heights.

This species was observed in small numbers during the BUS surveys with six individuals during autumn 2021 and three during summer 2022.

White-throated Needletail

This White-throated Needletail *(Hirundapus caudacutus caudacutus)* is widespread in eastern and south-eastern Australia and large numbers usually appear in Victoria and south-east NSW in December and later peak in Tasmania during February to March. In Tasmania, the number of birds of this species begins to increase in January, becoming common in February with most sightings occurring in March. This subspecies is a trans-equatorial migrant that breeds in the Northern Hemisphere summer and migrates south for the Southern Hemisphere summer. The White-throated Needletail is mostly aerial in Australia, flying at heights of less than one metre up to more than 1000 metres above the ground (Higgins 1999; Threatened Species Scientific Committee 2019).

This species is almost exclusively aerial in Australia, usually moves around in flocks, and occurs over most habitat types. It is most often recorded above wooded areas, including open forest and rainforest, and may also fly below the canopy between trees or in clearings. When flying above farmland, it is more often recorded above partly cleared pasture, plantations or remnant vegetation at the edge of paddocks. Many observations found needletails preceding or arriving with or soon after a frontal weather change or other atmospheric disturbance (Higgins 1999; Threatened Species Scientific Committee 2019).

White-throated Needletails have been reported to roost in foliage at night in Australia. There are descriptions of these swifts roosting (Corben *et al*. 1982; Day 1993; Tarburton, MK 1993), but few recorded instances. White-throated Needletail roosting habitat is considered to be absent from the development area. However, large trees suitable for roosting could be found within the vast tracts of forests surrounding the Pieman Lake.

White-throated Needletail was observed on 10 occasions during the formal BUS in autumn 2021. Its presence coincided with the passage of a flock of the birds within the time of its peak presence in Tasmania comprising up to 30 birds. A group of 6 and another group of 12 birds of this species were observed at RSA height (from a total count of 127 observations). Two additional birds were recorded incidentally outside the wind farm boundaries during the summer 2022 BUS.

The recorded number constituted 17.7 percent of all birds recorded from the two seasonal surveys, or 24.9 percent of birds recorded during the autumn 2021 survey. Of the total number of needletail recorded in autumn 2021, 18 were recorded at RSA height (46.2% of all birds observed at RSA height, or 3.5% of all birds recorded at the wind farm site in autumn 2021 (Table 8)).

Notwithstanding the relatively high number of needletails in autumn 2021 compared to the other birds on the wind farm site, this dominance was only short term. The count of birds during the BUS period coincided with the period of maximum presence of the needletails in Tasmania. Such number would only prevail for a short period of mostly two or three weeks. Furthermore, the

needletails do not necessarily visit the wind farm site regularly during their presence in Southern Tasmania. Their presence is governed by weather fronts and other atmospheric conditions or merely a chance event.

White-throated Needletail mortality from collision with wind turbines within Australia is known to occur, although is a low severity threat, it affects a small number of birds (Hull *et al*. 2013; Nature Advisory, unpubl. data). Over a a period of 10 years, an estimate of 22 birds collided with turbines at Bluff Point and Studland Bay Wind Farms in Tasmania (Hull *et al*. 2013). At the time of the current BUS, no needletail casualty was recorded at the neighbouring Granville Harbour Wind Farm (Personal Communication).

3.5. Conclusions and Recommendations

The conclusions from the autumn 2021 and summer 2022 bird utilisation surveys at the proposed Whaleback Ridge Wind Farm site are presented below.

- The majority of the study area consists of Buttongrass moorland (MBU) with areas of heathy vegetation over undulating hilly grounds and Eucalyptus Forest within the gullies interspersing the higher plateaus of Buttongrass moorland. These habitat types support an average diversity and abundance of common, predominantly heathland adapted bird species within the study area.
- The ridge heath cover was dry with little water available for birds in summer 2022 compared to autumn 2021. This condition resulted in a relative low bird relative density in summer 2022, particularly when comparing numbers with those recorded during the autumn 2021 BUS surveys.
- Species richness at the 18 impact survey points was relatively consistent and characterised by very low diversity with a total of 32 and 28 species of birds recorded during the autumn 2021 and summer 2022 BUS, respectively.
- Total abundance at impact and reference survey points was low over the two weeks of BUS with a total of 510 and 74 counts in autumn 2021, and 207 and 2022 counts of individual birds in summer 2021, respectively. Relative abundance was consistent across the wind farm site.
- The overall relative density (birds per hectare per hour calculated for combined seasons) varied between 0.08 to 4.26 birds per hectare per hour with an overall average for the whole windfarm estimated at 1.58 birds per hectare per hour, which is very low.
- Flight heights at rotor swept area (87.5 to 242.5 metres above ground) were restricted 7.8 percent of counts in autumn 2021, and to 0.5 percent of counts at impact survey points in summer 2022 surveys. No counts at RSA heights were made at any of the reference points.
- During the BUS, the study area supported comparatively few raptors and no waterbirds.
- Two threatened species were recorded during the two seasons of BUS, namely, Wedge-tailed Eagle (recorded only once in both seasons), and the White-throated Needletail (recorded only during autumn 21 survey) was recorded.
- The Wedge-tailed Eagle was recorded on one occasion during BUS at impact sites in both of the two seasons of the survey, and constituted a very low utilization rate over the wind farm site (0.04 birds/ha/hour).
- White-throated Needletail was observed on 10 occasions and its presence coincided with the passage of a flock of the birds within the time of its peak presence in Tasmania comprising up

to 30 birds. A group of 6 and another group of 12 birds of this species was observed at impact survey points at RSA height (from a total count of 127 birds).

- The results from the bird utilisation surveys are statistically robust and support a Before-After-Control-Impact (BACI).
- The selection of the current site for the establishment of a wind farm would create very low adverse effects on the bird population in the area as bird density was very low and over 92% of the observed birds flew below RSA height.

Recommendations

The BUS data strongly suggests that the habitat is uniform and bird abundance is very low at Whaleback Ridge Wind Farm.

The number of birds at the wind farm site were basically resident birds well adapted to the habitat conditions of the ridges. Few summer visitors arrive to the area during the summer months including birds such as the migratory White-throated Needletail.

Bird numbers and diversity at the study site are not primarily determined by changes in migratory bird species arrival or departure, but mainly determined, as the BUS data showed, by the availability of food, especially nectar for honeyeaters (a common species at the wind farm site) and presence of water. These could vary between years based on weather and climate conditions.

There was no obvious change in bird diversity between the autumn and summer seasons as little change was expected from the resident birds, with the occasional migratory summer visitor in Southwest Tasmania. Migratory birds will be present in the late summer/autumn season and therefore the autumn survey was adequate to observe these migratory birds before leaving the area.

4. Raptor Surveys

4.1. Introduction

Raptor surveys were undertaken in early autumn 2021 (2-14 March 2021), and in summer 2022 (19-26 January 2022). The purpose of the raptor surveys was to assist with understanding the level of activity of raptors across the site to inform potential risk of impact to threatened species. This report provides the method and results of raptor surveys conducted during autumn 2021 and summer 2022.

4.2. Methods

4.2.1. Existing Information

Existing records of threatened raptor species including observations and historical nest records were obtained from an area termed the 'search region', defined here as an area with a radius of ten kilometres from the boundary of the study area. The records in the search region were obtained from the *Natural Values Atlas* (NVA), a database administered by the Department of Primary Industries, Parks, Water and Environment (DPIPWE). The following previous reports containing raptor survey results in areas overlapping or contiguous with the study area were also reviewed prior to the surveys.

- Granville Harbour Wind Farm – Matter of National Environmental Significance (Brett Lane & Associates Pty Ltd, 2012)
- Heemskirk Wind Farm – Avifauna Monitoring Study (Biosis Research Pty Ltd, 2002)
- Preliminary Eagle Nest Search (Mooney 2022)

4.2.2. Fixed-point count method

The fixed–point count method was implemented for the raptor survey. The autumn 2021 survey conducted in March captured a time when young would have generally fledged from their nest and still remained in their parents' territories. The summer 2022 survey conducted in January captured the time just at the end of the breeding season when young would have been preparing to or recently fledged from their nest. Eight replicates were carried out at each of the 18 survey sites (Figure 4).

Survey points were chosen based on vantage points with at least 180-degree views in accessible areas. All survey sites were visited equally at different times of day to allow for time-of-day differences in raptor movements and activity. The times the surveys were undertaken during the survey period are outlined in Table 10. The survey effort across the study area equated to 16 survey days by having two zoologists conducting raptor surveys at separate points simultaneously during an 8-day survey period.

The survey points were the same points used for BUS, but numbered differently. Point 17 of the autumn 2021 survey was not visited in summer 2022, instead point 4 was used in the summer 2022 survey.

The fixed-point count method involved an observer stationed at a survey point for 20 minutes. All raptor species and number of individual raptors observed as far as the eye could see (with the help of binoculars) were recorded. The species, the number of birds and the height of the bird when first observed was documented. Nature Advisory ornithologists have years of experience undertaking BUS and raptor surveys and are proficient in visually estimating flight heights of birds

by using reference points in the field to determine the distance and height from the ground of an observed bird (see also Section 3.3).

Flights paths of all observed raptors were plotted on a map. In the circumstance where a pair of raptors were observed flying in the same direction and moving closely with each other, these were plotted as one flight path (though recorded as two observations in the results). This accounts for discrepancies between number of observations and number of flight paths.

Incidental observations of raptors were recorded while moving between survey points within and outside the study area.

Table 10: Survey schedule of raptor surveys

Days*	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00
1	9	10	11	12	13	9	10	11	12	13
	4	14	15	16	18	4	14	15	16	18
2	12	13	9	10	11	12	13	9	10	11
	18	4	14	15	16	18	4	14	15	16
3	13	9	10	11	12	13	9	10	11	12
	15	16	18	4	14	15	16	18	4	14
4	11	12	13	9	10	11	12	13	9	10
	14	15	16	18	4	14	15	16	18	4
5	2	3	4	5		2	3	4	5	
	1	8		7	6	1	8		7	6
6	4	5		2	3	4	5		2	3
		7	6	1	8		7	6	1	8
7		2	3	4	5		2	3	4	5
	7	6	1	8		7	6	1	8	
8	3	4	5		2	3	4	5		2
	8		7	6	1	8		7	6	1

* The two lines at each day of the survey were carried out by two zoologists

4.2.3. Location of survey points

A total of 18 survey points were located across the Whaleback Ridge Wind Farm on the ridges or vantage points where turbines were proposed. The survey points were distributed as evenly as possible (subject to access constraints), were at least two kilometres apart and were positioned as far as possible on elevated ground, allowing a clear view in all directions (Figure 4).

Table 11 provides a description of the locations of each fixed-point raptor survey point. Typically, turbines are proposed along the ridges in treeless landscapes. Heathland dominated by Buttongrass (*Gymnoschoenus sphaerocephalus*) was the dominant habitat at the study area locally known as Buttongrass moorland. The Buttongrass moorland was growing from infertile quartzite soils. The landscape was uniform throughout, with Buttongrass moorland on the ridges and eucalypt woodlands on the slopes and gullies.

Table 11: Description of habitat at each raptor fixed-point survey

Survey site	Habitat description
1	Very high point on the site. Buttongrass moorland with some heath. Sparse and short vegetation.
2	Very high point on the site. 360 degrees view for far distances in all directions. Buttongrass moorland with some heath. Sparse and short vegetation.

Survey site	Habitat description
3	Located on top of a high ridge, 360-degree views for far distances. Buttongrass moorland with some heath, sparse and low vegetation.
4	Buttongrass moorland, with some heathy species. Sparse and short vegetation. Non restricted views 360 degrees.
5	Buttongrass moorland with some heath, low and sparse vegetation. A gully nearby with some eucalypts. Was burnt in 2019 fires.
6	Buttongrass moorland along flat ridge, no trees in the counting area.
7	Buttongrass moorland along flat ridge, no trees in the counting area.
8	On top of hill. Buttongrass moorland, with few low banksias along the slopes.
9	Buttongrass moorland dominated by tea-tree and Buttongrass. Some short eucalypt trees in gullies.
10	Located on top of hill at Donnelly's lookout, 360-degree views, can see more then 10km in each direction. Buttongrass moorland, heath in gullies down the hill, eucalypt woodland in low lying areas surrounding hill.
11	On top of hill, 360 degree views out to 2-5 kms. Buttongrass moorland, very short and sparse, small rocks present.
12	On top of a hill 360 degree views out to 5km. Buttongrass moorland dominated by tea-tree and Buttongrass, some small eucalypt trees but mainly treeless.
13	On top of a hill, 360 degree views out to 1-5km. Buttongrass moorland dominated by tea-tree, heath and Buttongrass. Woodland nearby to the east, some dead trees which make good perching sites for raptors.
14	Hill top between to two larger hills, lows trees running north down slope to water course, Buttongrass moorland along slope to the south.
15	Ridge Top, Buttongrass moorland. Strip of dead shrubs ~1m in height along road and Buttongrass becoming shorter down slopes.
16	Ridge top, Buttongrass moorland along road, becoming shorter down slope. Few dead shrubs along roadside.
17	Ridge top, Buttongrass moorland with low shrubs. Taller dead shrubs along road and extending down slopes.
18	Undulating hills down to the coast, low grass and a few Silver Banksia (*Banksia Marginata*) with pockets of eucalyptus in the gullies.

4.2.4. Limitations

Due to the site being remote, conditions of the surveying permit to only access the study area along formed tracks and some tracks being inaccessible, not all areas of the proposed Whaleback Ridge were accessible. Every effort was made to spatially distribute survey points evenly across the study area. The survey design is considered appropriate to gain an understanding of how raptors are utilising the study area. Access to the observation points was easier in summer than in autumn as the ridges were dry.

Figure 4: Raptor survey points and flight paths

Project: Whaleback Ridge Renewable Energy Project
Client: Westcoast Renewable
Date: 28/11/2022

- Wind farm boundary
- Turbine exclusion zone
- Raptor survey points
- Brown Falcon (perched)
- Brown Falcon
- Brown Goshawk
- Collared Sparrowhawk
- Swamp Harrier
- Unidentified large raptor

Observations in Summer 2022
Observations in Autumn 2021

N

Metres
0 1,800

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4.3. Results

4.3.1. Overall Raptor survey results

Six raptor species were observed at the wind farm and surrounding area during the two survey periods with 53 sightings of raptors, including 27 incidental observations recorded outside the formal raptor surveys. Table 12 summarises results from both survey seasons, and Appendix 2 provides the details of field assessments.

In addition, incidental observations of raptors were made in and adjacent to the wind farm site during the aerial nest surveys undertaken by Moonee in October 2022 (7 Grey Goshawk, 6 Wedge-tailed Eagle and 3 White-bellied Sea-eagle, (Moonee 2022)).

The number of raptors recorded during the formal survey time varied between species and seasons. Numbers recorded and importance of species are summarised as follows:

- **Autumn 2021**: In total, 24 observations were recorded from five raptor species at the wind farm site and the surrounding area during the survey period. Eleven of these observations were during the formal surveys and 13 were incidental sightings while traversing between survey points and outside of formal surveys.
- **Summer 2022**: In total, 29 observations were recorded from five raptor species at the wind farm and the surrounding area during the monitoring period. Fifteen of these observations were during the formal surveys and 14 were incidental sightings.

Overall raptor numbers and activity across the site was low. Of the six raptor species observed, all were common with the exception of two species, the Tasmanian Wedge-tailed Eagle which is endangered under the Commonwealth EPBC and Tasmanian TSP Act and the White-bellied Sea Eagle which is vulnerable under the TSP Act. Detailed review of existing information and the survey results for these two threatened species are provided in the following sections.

Table 12: Summary of raptors recorded at the proposed Whaleback Ridge Wind Farm and surrounds

Raptors	Autumn 2021			Summer 2022			Grand total
	No. raptors observed at			No. raptors observed at			
	Survey	Incidental	Total	Survey	Incidental	Total	
Wedge-tailed Eagle	7	11	18	1	2	3	21
Brown Falcon	1	1	2	7	5	12	14
Swamp Harrier	2		2	7	2	9	11
Brown Goshawk	1		1				1
Collared Sparrowhawk		1	1				1
White-bellied Sea-Eagle					4	4	4
Unidentified (Goshawk or Sparrowhawk)					1	1	1
Grand Total	11	13	24	15	14	29	53

4.3.2. Tasmanian Wedge-tailed Eagle

Background information

The Tasmanian Wedge-tailed Eagle is a sub-species of the mainland Wedge-tailed Eagle (*Aquila audax audax*) and is listed as endangered under both the commonwealth EPBC Act and the Tasmanian TSP Act. This species is listed as threatened species due to estimated low number of

breeding pairs and breeding success and the high rate of mortality from unnatural causes including shooting, poisoning and electrocution. Key threats include loss of nesting habitat, disturbance of nesting birds, collision with man-made structures and persecution (Starker Leopold & Wolf 1970, Gaffney and Mooney 1992, Melbourne University 2004).

The sub-species occurs in a wide range of habitats including wooded and forested lands to open country. Their breeding sites are quite specific and require nests in emergent trees in sheltered patches of old-growth native forest (Brown and Mooney 1997). Trees selected for nesting are usually greater than 27 metres in height, on a slope with an eastern, south-eastern or southern aspect and the position of the nest is usually below the ridge to the windward side within the forest canopy (Threatened Species Section DPIW 2006). The Wedge-tailed Eagle are known to have several historical nests in their territory and typically rotate their use from year to year.

Foraging requirements are less specific, with the Tasmanian Wedge-tailed Eagle being generalists and opportunistic predators who will forage where their prey is accessible. The diet is varied, consuming both live prey and carrion including Rabbit (*Oryctolagus cuniculus*), European Brown Hare (*Lepus europaeus*), Cat (*Felis catus*), Red-necked Wallaby (*Notamacropus rufogriseus subsp. rufogriseus*), Tasmanian Pademelon (*Thylogale billardierii*), Short-beaked Echidna (*Tachyglossus aculeatus*), possums, birds, reptiles and occasionally domestic stock (University of Melbourne 2004).

Wedge-tailed Eagle are monogamous and are paired for life, only being replaced if one dies. Established pairs are territorial and live in the one area throughout the year. The pair will defend their nesting territory from other eagles and raptors. Surrounding their nesting territories are large home ranges that the pair do not defend but rather use for hunting (University of Melbourne 2004).

Immature and sub-adult birds are considered to be nomadic (Marchant and Higgins 1993). The mainland population is known to travel vast areas in search of food and eventually a mate and its own territory.

Distribution in Tasmania

Tasmania's western bioregion has been documented as having lower densities of Wedge-tailed Eagle than other areas across the State. Previous surveys and impact assessments for Granville Harbour Wind Farm and Heemskirk Wind Farm document that Wedge-tailed eagle densities in the western parts of the state are estimated to be around one pair per 120,000 ha (Bell and Mooney 1999; Smales and Muir 2005). This is compared with the estimated density for lowland eastern and northern Tasmania of approximately one pair per 2,000 - 3,000 ha (DCCEEW, 2022). The project area for Whaleback Ridge is 40,000ha, a fraction of their estimated home range in Western Tasmania.

During survey efforts for Granville Harbour Wind Farm, adjacent to the Whaleback Ridge Project, no Wedge-tailed Eagles were observed and no nests were found during aerial nest surveys (Pitt and Sherry, 2013). Similarly, during the survey efforts for Heemskirk Wind Farm (a wind farm previously approved in an overlapping section along the coast of the Whaleback Ridge Project), site utilisation by raptors was confirmed to be low in comparison to other wind farm sites (Biosis Research, 2002). Granville Harbour Wind Farm has had 31 wind turbine generators operations for almost two years with no mortality of Wedge-tailed Eagle or White-bellied Sea Eagle reported to date (personal information from Granville Harbour Wind Farm landholder).

Desktop review of the Natural Values Atlas (DPIPWE 2021) indicated that within the search region there were low numbers of historical observations of both Wedge-tailed Eagle and White-bellied Sea Eagles.

The review of existing information, NVA records (DPIPWE 2021), indicated that within the search region there were five historical nesting sites of the Tasmanian Wedge-tailed Eagle. Off the five historical nesting records, The Pieman Lake nest was the only nest within the wind farm study area (Figure 5). No active eagle nests were observed during aerial eagle nest surveys of the study area completed in May-June 2022 which included checking of historic nest locations near Pieman Lake and historic nest records within 5km of the study area (Mooney 2022, Table 13).

Table 13: Results of eagle nest observations (Mooney 2022)

Survey Date	Easting/Northing	Nest Number	Notes	Location
13/5/2022	145.13981/ -41.70771	663	Not found	North of project area (outside)
13/5/2022	145.26881/ -41.77115	714	Not found	North of Pieman Lake within project area
30/6/2022	145.37861/ -41.73861	1809	Not found	Northeast of project area (outside)
30/6/2022	145.23385/ -41.93053	1771	Nest re-located. Looked unused for several years, no eagles seen, viable.	South of project area (outside)
30/6/2022	145.03830/ -41.93053	n/a	New nest found, no eagles seen, suspect White-bellied Sea-eagle nest. Prime.	West of project area (outside)

Survey Results

Over a survey effort equivalent to 16 survey days (8 days x 2 zoologists) a total of 18 Wedge-tailed Eagle flights were observed, 15 within the wind farm study area and 3 outside. As a high-level comparison this is equivalent to a rate of 0.5 Wedge-tailed Eagles observed per day making it the lowest observation rates in Tasmania other than Granville Harbour Wind Farm.

The number of flights of the Wedge-tailed Eagle for both survey periods are detailed in Table 12 Table 14 and Figure 5.

Table 14: Wedge-tailed Eagles observations

Wedge-tailed Eagle	During Survey	Incidental
No. of flights within the wind farm study area	7	8
No. of flights outside of study area	0	3

The average number of flights observed per survey day was 0.44 during the official raptor surveys. Compared to other wind farms in Tasmania (Table 15 the average number of WTE flights per survey days is very low.

Table 15: Average number of WTE flights observed per survey day at wind farms in Tasmania (GHD 2021)

Wind farm site	Average number of flights per survey day
Granville Harbour (west coast)	No flights recorded
Jim's Plain (north-west)	0.6
Port Latta (north-west)	1.15
Robbins Island (north-west)	2.68
Musselroe (north-east)	4
Bluff Point and Studland Bay (north-west)	4
Low Head (north-east)	10
Cattle Hill (central highlands)	12

Wedge-tailed Eagle was observed in much lower numbers utilising the wind farm area during the summer 2022 surveys compared to the autumn 2021 surveys. It seemed probable that eagle numbers suffered similar reduction in its abundance or activity as that observed among other species of birds (see BUS Section 3.4.4). Summer 2022 was very dry and might have resulted in an unsuccessful breeding season, and hence less eagles utilising the study area and its surroundings. No nesting sites were observed during the summer 2022 surveys and no nests were located within the wind farm area during the eagle nest searching May- June 2022 (Mooney, 2022).

The pattern of use of the wind farm site by WTE is demonstrated in Figure 5. No real pattern or high-risk areas were identified. Three flight paths of WTE were recorded over Lake Pieman and three incidental observations of WTE were made near Zeehan. These paths are away from proposed turbine development areas. Four WBSE observations were made near Trial Harbour along the coast and outside of the study area. Due to the lack of nests within the study area found during surveys, the very large range of eagles in the Western bioregion of Tasmania and the lack of clear pattern of eagle flight paths observed the study area is believed to be inhabited by very few Wedge-tailed Eagle and is likely to be part of the territory of one pair that is breeding away from the wind farm site. This is consistent with the understanding of the homogenous and exposed habitat within the study area that does not support an abundance of food for raptors.

4.3.3. White-bellied Sea-Eagle

Background information

The White-bellied Sea-eagle *(Haliaeetus leucogaster)* is listed as vulnerable under the Tasmanian TSP Act and inhabits maritime habitats, terrestrial large wetlands and coastal lands of tropical and temperate Australia and offshore islands, ranging far inland only over large rivers and wetlands. The eagles usually breed on the coast and offshore islands and inland beside large lakes or rivers, usually in tall trees in or near water, also in cliffs, rock pinnacles and escarpments (Marchant & Higgins 1993).

Survey Results

White-bellied Sea-eagle were not observed during the formal raptor surveys in autumn 2021 and summer 2022. Three incidental observations were made in summer 2022 outside the study area near Trial Harbour close to the coast with two single observations and one observation capturing two birds (overall four birds).

Table 16: White-bellied Sea-eagle observations

White-bellied Sea-eagle	During Survey	Incidental
No. of flights within the wind farm study area	0	0
No. of flights outside of study area	0	4

The eagle nest survey undertaken in May and June 2022 found one eagle nest north of Granville Harbour outside the proposed wind farm site that is suspected to be used by White-bellied Sea-eagle (Mooney 2022).

The low number of White-bellied Sea-eagle observations, with no observations within the study area and a suspected nest close to the coast and outside the wind farm site means that the risk of the proposed wind farm to this species would be very low.

4.4. Conclusions and recommendations

The conclusions from the Raptor surveys are detailed below.

- Utilisation rates of raptors, and in particular threatened species, was very low across the study area.
- Two of the six observed raptor species are listed as threatened species, the White-bellied Sea-eagle is listed as vulnerable under the TSP Act and the Tasmanian Wedge-tailed Eagle is listed as endangered under the commonwealth EPBC Act and Tasmanian TSP Act.
- The observations of Wedge-tailed Eagle flights per survey day (0.44) are the lowest of any wind farm compared to other wind farms in Tasmania with the exception of the neighbouring Granville Harbour Wind Farm.
- No areas with high risk of collision or impact were identified within the study area given the low utilisation rate of Wedge-tailed Eagle, lack of active nesting sites and lack of observations of the White-bellied Sea-eagle within the study area.

Figure 5: Wedge-tailed Eagle and White-bellied Sea-eagle flight paths

Project: Whaleback Ridge Renewable Energy Project
Client: Westcoast Renewable
Date: 28/06/2023

- Wind farm boundary
- Turbine exclusion zone
- Historical eagle nests
- Raptor survey points
- Wedge-tailed Eagle
- White-bellied Sea-eagle

Observations in Summer 2022

Observations in Autumn 2021

663
New nest
1809
714
1771

N

Metres
0 2,000

Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

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5. Orange-bellied Parrot

5.1. Introduction

Targeted surveys for Orange-Bellied Parrots were undertaken on three occasions throughout March 2021 and April 2022 to provide information on the presence or otherwise of the threatened Orange-bellied Parrot (*Neophema chrysogastera*) at the proposed Whaleback Ridge Wind Farm and nearby coast and outline any implications under various national, state and local legislation and policy.

This section of the report presents the findings of the Orange-bellied Parrot assessment and provides recommendations and mitigation options.

5.2. Background information – Orange-bellied Parrot biology

5.2.1. Description

The Orange-bellied Parrot is a small (at *c.* 46 grams), bright green parrot with dark blue in the outer wing, a small blue patch on the forehead and a yellow abdomen with a bright orange patch that is particularly evident in adult males. Females and juveniles are slightly duller, but brighter green in all plumages than closely related species that may share its range, such as Blue-winged Parrot (*Neophema chrysostoma*) in Tasmania. The species has a distinctive buzzing alarm call which enables instant recognition. This call is quite different to the musical twittering that other *Neophema* species (e.g., Blue-winged Parrot) may give.

Orange-bellied Parrot may be distinguished from Blue-winged Parrot by the brighter shade of green (grass green as compared to dull olive-green), smaller area of blue on the wing, and presence of an obvious orange patch on the belly of adult males and some adult females (although adult male Blue-winged Parrot sometimes have an orange belly patch). The vocalisations can be diagnostic.

5.2.2. Habitat

In its breeding range in south-west Tasmania the Orange-bellied Parrot inhabits a forest and heath mosaic, with creek lines containing paperbark (*Melaleuca* spp.) and tea tree (*Leptospermum* spp.) and open areas dominated by Buttongrass, heath and sedges. It generally nests in hollow limbs or trunks of Smithton Peppermint (*Eucalyptus nitida*), although Black Gum (*E. ovata*) has been used at least once (Orange-bellied Parrot Recovery Team, 2006).

On passage in north-western Tasmania and King Island, and on the wintering grounds on mainland Australia, Orange-bellied Parrots primarily use Coastal Saltmarsh and beach dune communities. They also utilise nearby paddocks, pastures, brackish and saline swamp margins and sewage lagoons. The species regularly occurs on golf courses where these areas abut saltmarsh near the coast. These open habitats are often backed by paperbark or tea tree, in which the species roosts at night (Higgins, 1999).

5.2.3. Distribution

The Orange-bellied Parrot breeds in coastal south-west Tasmania, from Birches Inlet south to Melaleuca. Since 2007, the population around Birches Inlet no longer resides here, leaving the only significant breeding population located within 20 kilometres of Melaleuca (Orange-bellied Parrot Recovery Team, 2006; R. Sims pers. comm., June 2010).

From March to May, there is a protracted migration to mainland south-eastern Australia, through western Bass Strait where regularly visited sites include King Island. In some years a few birds remain on King Island throughout winter. The majority of the population spends winter between

central Victoria and the Coorong region in South Australia. Occasional individuals stray as far as Maroubra near Sydney, New South Wales and Adelaide, South Australia (Birdata database; Orange-bellied Parrot Recovery Team, 2006).

5.2.4. Threats

Threats to the Orange-bellied Parrot are not clearly understood. Reasons for their decline are thought to include the following (after Brown and Wilson 1980; Higgins, 1999; Orange-bellied Parrot Recovery Team, 2006; Garnett et al., 2011).

- Habitat fragmentation and alteration, including
    - Coastal development
    - Urbanisation
    - Grazing and agriculture
    - Altered estuarine and saltmarsh hydrology.
- Wind farms
- Altered fire regimes (in Tasmania)
- Introduced predators (e.g., Red Fox and Feral Cat)
- Changes in abundance of native predators
- Competition for nest sites by introduced species such as Common Starling (*Sturnus vulgaris*), Sugar Glider (*Petaurus breviceps*) and European Honey Bee (*Apis mellifera*)
- Competition for foraging resources from Blue-winged Parrot and seed-eating birds such as finches and sparrows) and House Mice (*Mus musculus*) (on migration and in winter)
- Brightly lit fishing boats affecting navigation during migration
- Disease (e.g., Psittacine Circoviral Disease, PCD).

For some of these perceived threats there is no empirical evidence to support the proposition that they are detrimentally affecting the Orange-bellied Parrot.

5.2.5. Legislative protection

The Orange-bellied Parrot is listed as critically endangered under the Commonwealth EPBC Act and endangered under the Tasmanian TSC Act.

5.3. Methods

5.3.1. Existing information

Existing information on the status of the Orange-bellied Parrot was obtained from Tasmania's Natural Values Atlas - database held by the DPIPWE (Tasmanian Government). These records were obtained from an area, termed the 'search region' defined for this assessment as a polygon extending north to the Pieman River, inland to Reece Dam, south to Zeehan and Strahan and including all the coastline between Pieman River and the entrance to Macquarie Harbour.

The likelihood of suitable habitat in the study area for nationally threatened fauna species was ascertained through a search of the online *Environment Protection and Biodiversity Conservation Act 1999* Protected Matters Search Tool (DAWE 2021) using the same search region.

The following previous reports in areas overlapping or contiguous with the study area were reviewed prior to the current site inspection.

- Granville Harbour Wind Farm – Matter of National Environmental Significance (Brett Lane & Associates Pty Ltd, 2012)
- Heemskirk Wind Farm – Avifauna Monitoring Study (Biosis Research Pty Ltd, 2002).

5.3.2. Habitat assessment

Along each transect of coast and accessible tracks inland to 5 km, the vegetation type, structure and habitat quality were examined prior to or during the survey period. These habitat components, considered important in influencing the distribution of the threatened Orange-bellied Parrot, were assessed for each different survey transect.

5.3.3. Field methodology

Roaming surveys and point count surveys were undertaken from 22nd to 25th March 2021, 12th to 15th April 2022 and 25th to 28th April 2022 by a team from Nature Advisory including Khalid Al-Dabbagh (Senior Zoologist), Guille Mayor (Ecologist) and Peter Lansley (Senior Zoologist), all experienced ornithologists. Two ornithologists participated in each survey.

In 2021, transects were walked or slowly driven, according to accessibility by vehicle, from Granville Harbour south-east to Trial Harbour and extending up to five kilometres inland, during conditions suitable for detecting Orange-bellied Parrot. During the search, coastal vegetation was scanned by binoculars and the species' distinctive buzzing alarm call listened for. Additionally, nearby areas outside the extent of the wind farm boundary were also surveyed by driving slowly (e.g., Granville Harbour north along the coast to area of sand dunes and Newdegate Creek). Two observers covered different parts of the study area simultaneously to achieve maximum coverage.

Transects were possible only in corridors close to accessible coastline and tracks accessible by Utility Task Vehicle (UTV [buggies]). *Neophema* parrots within 30 metres of observers or vehicles are likely to be flushed from cover. Binoculars were used to extend the search coverage in areas where viewing conditions allowed, such as from elevated vantage points like hilltops.

In March 2021, weather conditions varied during the surveys from fine, mild, overcast and almost calm with some light rain to cool and sunny with a moderate westerly breeze. Conditions during this autumn survey were rather benign, varying from approximately 8° to 17°C. Orange-bellied Parrot were not likely to be overlooked in the areas surveyed, due to the large extent of open habitat or short vegetation (<2 metres, and often, <1 metre high) preferred by *Neophema* parrots when feeding.

Similarly, in April 2022 conditions were generally benign. One or two short heavy showers occurred on 12th April, otherwise fine, cool to mild conditions prevailed. Temperatures ranged from 6° to 16°C. Winds were usually light and varied from all directions. During one early morning point count, fresh to strong south-west winds occurred, but conditions for detecting Orange-bellied Parrot remained good.

In April 2022, almost the entire length of Climies Track, and several minor track offshoots, were covered by two observers travelling in separate UTVs. Embedded within this roaming survey were 40-point counts, mostly of 15 minutes duration, carried out by each observer (see Figure 7 and Appendix 4 for transects and points surveyed). Several of these counts were of 30 minutes duration. These covered a variety of distances from the coast to approximately 5 km inland in areas with good viewing of, in most cases, 360 degrees. Further, both observers walked an area of coast south from Trial Harbour on 14th April 2022 and a similar area checked for Orange-bellied Parrot and their habitat, north from Granville Harbour on 26th April 2022 (one observer) and 27th April 2022 (two observers). At all times during these surveys the observers were watching and listening

for Orange-bellied Parrot. Finally, two point-counts of over an hours' duration were conducted by both observers simultaneously on 27th April 2022 from coastal headlands in the early morning and late afternoon, to cover more thoroughly this time period when Orange-bellied Parrot may be passing through.

The targeted survey was conducted along the strandline, in coastal tussock grassland, coastal heath vegetation and low heath/Buttongrass plain (see Section 5.4.2 for more detail). Generally, vegetation rarely exceeded three metres in height; more frequently it was less than one metre tall. Along some creek lines, taller vegetation dominated by Smithton Peppermint was evident.

5.3.4. Limitations of field assessment

The timing of the Orange-bellied Parrot survey, its duration and the weather conditions under which surveying was undertaken, were considered suitable for detecting the species.

During transects covered by UTV (buggy), aural detection was reduced due to engine noise and wearing safety helmets. Similarly, there is a slight reduction in field of view from buggies. To counter this, all point counts were conducted standing clear of the buggies at sites offering maximum field of view, in most cases 360°.

Part of the Climies Track between Granville Harbour and Trial Harbour (www.tassietrails.org/routesandtrails/mountain-bike/granville-trial-harbour) was inaccessible due to degradation of the track. Nonetheless, in 2021 approximately one-half of the distance of this 17.8 kilometre-long track was covered by a combination of slow driving in UTVs and walking. In 2022 all but < 1km of the track, which was deemed too dangerous for traversing by buggies (steep creek crossing), was covered, in addition to offshoots to the coast and inland. Much of coastline between Trial and Granville Harbours is rocky habitat (see Figure 6). This habitat type is considered unsuitable habitat for Orange-bellied Parrot (although, the species must past through or around these areas on migration).

Although it cannot be ruled out that not all suitable areas for Orange-bellied Parrot were covered, a large sample of the geographical extent of the study area (coast to 5 km inland between Granville Harbour and Trial Harbour) was covered effectively during the 2021 and 2022 surveys combined.

The overall survey effort was considered sufficient to detect Orange-bellied Parrot in the study area at the time of the surveys. It is possible that some Orange-bellied Parrot had not yet migrated north at the time of the surveys, or had already migrated, however the timing of the surveys was believed to be optimum for detecting migration of Orange-bellied Parrot through the study area. Orange-bellied Parrot are known to have a leisurely northward migration spanning six weeks or more, from late February to mid-May when they traverse the west coast of Tasmania towards King Island where most birds will have arrived by June (Higgins 1999). All surveys were conducted following confirmed sitings of Orange-bellied Parrots on the mainland meaning the migration period was underway during the survey period.

Wherever appropriate, a precautionary approach has been adopted in the discussion of implications. That is, where insufficient evidence is available on the occurrence or likelihood of occurrence of a species, it is assumed that it could be in an area of habitat, if suitable, and the implications under legislation and policy are considered accordingly.

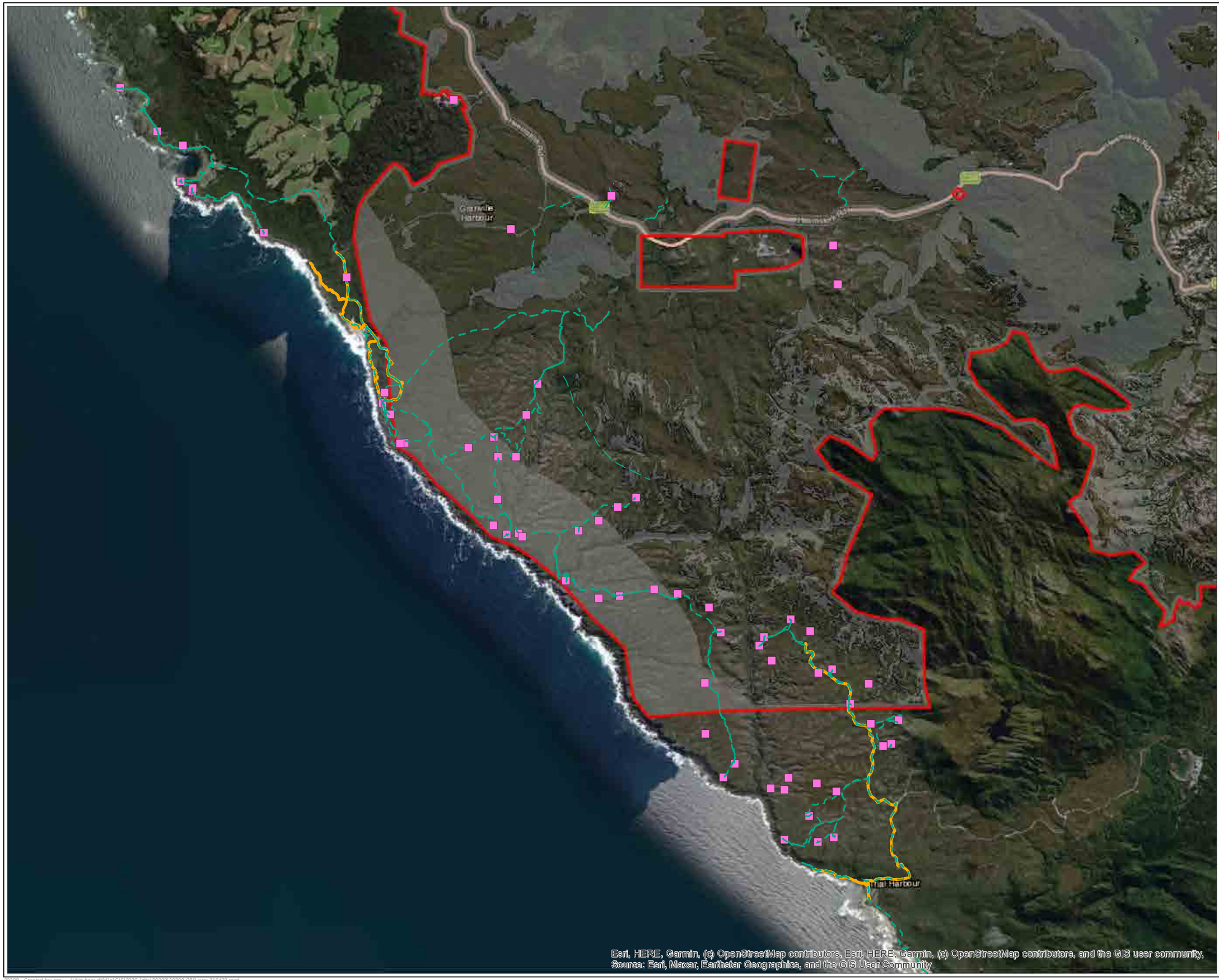

Figure 6: Orange-bellied Parrot targeted survey tracks and points 2021/2022

Project: Whaleback Ridge Renewable Energy Project
Client: Westcoast Renewable
Date: 26/11/2022

- Wind farm boundary
- Turbine exclusion zone
- Orange-bellied Parrot survey sites (2022)
- Tracks (2022)
- Tracks (2021)

N

Metres
0 1,000

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5.4. Results

5.4.1. Existing information

This sub-section provides a summary of the review of existing information including databases, previous reports in the search region and textbooks.

Tasmania's Natural Values Atlas

Tasmania's Natural Values Atlas (DPIPWE, 2021) was reviewed for records of Orange-bellied Parrot within the search region. Twenty records were documented from this database Appendix 3, extending from the Pieman River in the north to Strahan in the south. The records were dated from 1974 to 2021. Two records were away from the coast, including one from along the Pieman River and an isolated record inland from south-west of Corinna (Coordinates: zone 55G, easting 336412 northing 5379383 (stated accuracy 100 metres)), 4.7km from the coast (labelled as Granville Harbour, although 13km north of that location). There are a cluster of five records close to Strahan Aerodrome, 1-1.5km from the coast. All other records were strictly coastal (Figure 7).

Other previous targeted surveys

Heemskirk Wind Farm proposal - spring 2001 and autumn 2002 (Biosis Research Pty Ltd, 2002).

- This work concentrated on two sites, (a) one in the north near Granville and one in the south at Heemskirk between Granville Harbour and Trial Harbour. These surveys were conducted during the main northward (autumn) and southward (spring) migration of Orange-bellied Parrot.
- Precise limits of the 2001-02 study were (a) between Tasman River in the north, the ridgeline of the Heemskirk Range to the east and Granite Creek to the south; and (b) from Trial Harbour Road in the south, east to the ridgeline of the Heemskirk Range, and north to the intersection of South Gap Creek and Granville Harbour [Climies] Track. These limits are entirely within the study area used for Orange-bellied Parrot searches during this 2021/2022 study.
- No confirmed Orange-bellied Parrot observations during the study.

Granville Harbour Wind Farm (BL&A, 2012).

- These targeted Orange-bellied Parrot surveys were carried out during April 2012 over three full days, covering an area along the coast from Pieman River mouth to the south of Granville Harbour ('The Cannonball') and to about 5.5 km inland in accessible cleared areas or vehicular tracks.
- No Orange-bellied Parrots were recorded during the 2012 field work. Small numbers of Blue-winged Parrots were found at Granville Farm. BL&A (2012) found there was little or no risk to Orange-bellied Parrot from the wind farm, and no Orange-bellied Parrot casualties have been recovered by daily searches under turbines at Granville Wind farm since operations commenced (A. Simpson pers. comm. March 2021).

Handbook of Australian, New Zealand and Antarctic Birds

At least one historical published record exists from the Whaleback Ridge Wind Farm search region, at Trial Harbour (Higgins, 1999).

Recent population trend

After active management of this critically endangered species leading into the 2020-21 breeding season, 192 Orange-bellied Parrot were present at the breeding grounds at Melaleuca prior to

expected departure on northward migration from February to April 2021. This is the highest post-breeding population since records began in the early 1990s (Wildcare Tasmania, 2021). A comparable population at Melaleuca from 1992 to 1997 was estimated to be stable with around 100 breeding birds (Higgins, 1999) and from 1994 to 2004 with 71-116 birds (Garnett et al., 2011). More recently the population dropped to 35 birds post-breeding in 2016 (BirdLife International, 2021), before recovering in the past four years with active management of populations both on the breeding grounds and at wintering sites.

Surveys were carried out by 11 volunteers from the Friends of the Orange-bellied Parrot under co-ordination of the national Orange-bellied Parrot Recovery Team, on 10 April 2021, between Strahan and Granville Harbour. Four Orange-bellied Parrot were found within a two-kilometre radius of Strahan Aerodrome. The birds were in a group of two and two single birds (DPIPWE, 2021; Wildcare Tasmania, 2021).

Figure 7 shows the location of records of Orange-bellied Parrot from the Natural Value Atlas (DPIPWE, 2021) from the search region.

5.4.2. Habitat assessment

Suitable habitat for Orange-bellied Parrot was limited in the study area. Orange-bellied Parrot habitat observed in the study area is described below.

Strandline

Located on the primary dune where present, this habitat comprises mainly Marram Grass (*Ammophila arenaria*) and Sea Rocket (*Cakile maritima*). This habitat type was only found in small patches between Granville Harbour and Trial Harbour where the coastline is dominated by rocky substrates such as granite boulders. In the study area, it was concentrated on the north side of the Tasman River mouth.

Coastal tussock grassland

Mainly tussocks of Tussock-grass *(Poa poiformis)* and/or Prickly Spear-grass *(Austrostipa stipoides)* with some low herbs. Coastal tussock grassland was patchily distributed in a narrow zone between strandline and coastal scrub.

Coastal Scrub

Comprising Coast Tea-tree (*Leptospermum laevigatum*), Silver Banksia (*Banksia marginata*), Scented Paperbark (*Melaleuca squarrosa*), Coast Beard-Heath *(Leucoopgon parviflorus*) and others. This habitat was widespread in the zone between the coast and low heath/button-grass plain, extending inland along sheltered gullies with deeper soil.

Low heath / button-grass plain

Comprised of Buttongrass *(Gymnoschoenus sphaerocephalus)*, Swamp Honey-Myrtle *(Melaleuca squamea)*, occasional groves of Smithton Peppermint *(Eucalyptus nitida),* Silver Banksia *(Banksia marginate),* Sheoak *(Allocasuarina spp.)* and others. This was the most extensive habitat of the study area, particularly away from the coast.

5.4.3. Survey Results

One sighting of an adult Orange-bellied Parrot was recorded along the coastal boundary of the study area during the current investigation. The Orange-bellied Parrot was recorded approximately 35 metres form the coast in the northern section of the study area close to Foster's Creek, approximately one kilometre south of the Tasman River entrance, on 23rd March 2021 (Figure 7,

Table 17). The Orange-bellied Parrot was recorded in the coastal scrub habitat which had been opened up by recent burning (Photograph 2) and in close proximity to small areas of Coastal Tussock Grassland. Photograph 3 presents an image of the Orange-bellied Parrot that was observed showing blue in the outer wing (less extensive than on Blue-winged Parrot).

Table 17: Orange-bellied Parrot sighting in the current survey

Date	Time	Zone	Easting	Northing
23 March 2021	10:10	55G	339842	5365369
23 March 2021	10:30	55G	339818	5365542

Note: Coordinates refer to initial and final positions that the bird was seen

Photograph 2: Habitat of Orange-bellied Parrot, *c.* 1km south of Tasman River mouth, 23 March 2021

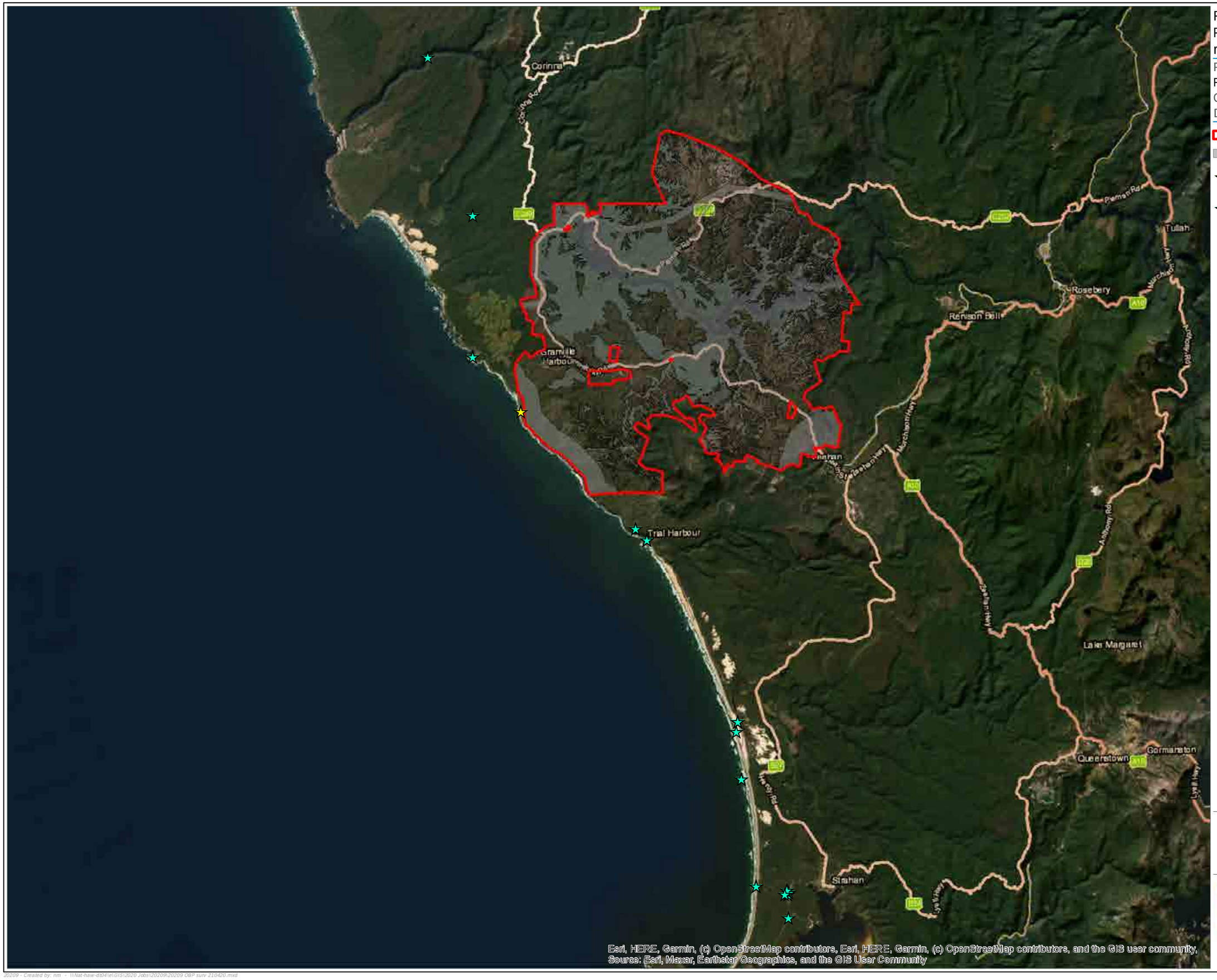

Figure 7: Orange-bellied Parrot records from search region

Project: Whaleback Ridge Renewable Energy Project
Client:Westcoast Renewable
Date: 26/11/2022

- Wind farm boundary
- Turbine exclusion zone
- Orange-bellied Parrot record (Nature Advisory, 2021)
- Orange-bellied Parrot Natural Values Atlas records

N

Metres
0 3,600

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Photograph 3: iPhone video frame of Orange-bellied Parrot in flight (in red circle), 23rd March 2021

During the March 2021 survey period and a Bird Utilisation/Raptor survey covering 12 days preceding this survey (2nd to 13th March, 2021), many (25+) Blue-winged Parrots were observed but only in cleared paddocks at Granville Farm, a cattle property and wind farm just north of Granville Harbour. There were no incidental records of Orange-bellied Parrot during the earlier Bird Utilisation/Raptor survey period.

During the April 2022 surveys, no Orange-bellied Parrots were recorded, despite the more comprehensive surveying conducted.

5.5. Discussion

The review of existing information indicates that the Orange-bellied Parrot migratory route is likely to be along the coastline. The majority of records from the Tasmanian Natural Values Atlas were located along the coastline with very few records inland.

Of the 20 records in the Natural Values Atlas from the Whaleback Ridge and surrounding search region extending north to Pieman River, south to Strahan and inland to Zeehan (DPIPWE, 2021):

- Five are in a cluster around Strahan aerodrome (i.e. less than 1.5km from the coast and at the base of a peninsula;
- One is from the Pieman River (of unknown positional accuracy);
- One remaining appears to be from 4.7km inland but is labelled 'Granville Harbour [which is on the coast, may be inaccurate co-ordinates); and
- All other records are strictly coastal (Figure 7).

Accordingly, there is no evidence of a significant number of Orange-bellied Parrot moving inland during their migration along this part of the western Tasmanian coastline. In habitat terms, it appears that on migration north from their breeding grounds near Melaleuca, the bulk of the

Orange-bellied Parrot population utilises strandline, coastal tussock grassland and coastal scrub vegetation types and rarely extend into low heath / button-grass plain further inland.

A turbine exclusion zone has been proposed so that turbines will not be developed within 1.5 km of the coast. As Orange-bellied Parrots migrate close to the coast.

5.6. Conclusions

The conclusions from the Orange-bellied Parrot survey are described below.

- The Orange-bellied Parrot was confirmed as occurring along the coast within the study area during the targeted survey, conducted during March 2021 and April 2022.
- On 23rd March 2021, one adult Orange-bellied Parrot was observed near Foster Creek, approximately one kilometre south of Tasman River, within 50 metres of the coast in coastal scrub habitat. The bird was initially seen flying north about one metre above the top of the vegetation and later observed from about 10 metres range as it perched on dead sticks in a burnt shrub.
- No other observations of Orange-bellied Parrot were made during the March 2021 or April 2022 surveys which included areas up to five kilometres inland.
- Coastal observations, i.e., those within 150 metres of sea or estuary, are to be expected for this species during the migration period. Excluding those recorded on estuaries or peninsulas, only one record of 20 in the broader search region was away from the coast (and its accuracy is questionable.)
- Current data combined with the historical records such as those gathered during the Heemskirk Wind Farm investigation (Biosis Research Pty Ltd, 2002) and the Granville Harbour Wind Farm (BL&A, 2012) suggest that few if any Orange-bellied Parrot migrate away from a narrow coastal strip of perhaps less than 150 metres from coastal waters.
- The species as a whole is rarely if ever seen more than three kilometres inland during its migration and wintering areas (Higgins, 1999).
- A turbine exclusion zone has been established to exclude turbine development within 1.5km of the coastline. This has been established to ensure turbines are not in the flyway of the Orange-bellied Parrot migratory route. This will ensure that any potential collision risk is minimised.
- The expected flight path of the bulk of the Orange-bellied Parrot population would be coastward of a line 150 metres inland.

5.6.1. Recommendations

To maximise the effectiveness of mitigation measures to avoid impact on the threatened Orange-bellied Parrot, the following is recommended.

- A construction exclusion zone extending from the coast and inland to 150 metres should be strictly adhered to during migratory periods.
- Turbines should be placed at least 1.5 kilometres from the coastline.

6. Bat Surveys

6.1. Introduction

In autumn 2021 and spring/summer 2021, bat surveys have been undertaken at the proposed Whaleback Ridge Wind Farm site to provide baseline data on the utilisation by bats of the site.

The bat utilisation surveys were undertaken in accordance with *Survey Guidelines for Australia's threatened bats* (DEWHA 2010), and consistent with methods adopted at many windfarms in eastern Australia over the last 20 years that have satisfied the information requirements of decision-makers and regulators.

The current report provides the results of the first two surveys undertaken in March 2021 (autumn) and November to December 2021 (spring/summer).

This investigation was undertaken by a team from Nature Advisory comprising Andrew Mcvinish (Zoologist), Khalid Al-Dabbagh (Senior Zoologist), Inga Kulik (Senior Ecologist & Project Manager) Bat call analysis was undertaken by Rob Gration (Director and Principal Consultant at EcoAerial).

6.2. Methods

Automated bat detectors (SongMeters) were placed at 16 locations across the prosed wind farm site and recorded species-specific echolocation calls of free-flying bats at these survey sites. The survey sites were representative of the habitat types of the wind farm site and located near proposed wind turbine locations (Figure 8). Songmeters were secured to trees or fence posts approximately 1.5 - 2 metres above ground. The detectors were programmed to commence operation approximately 30 minutes before dusk, and to cease approximately 30 minutes after dawn.

Each Songmeter unit used an 64GB SDHC card that recorded bat echolocation calls, along with the date and time of each call.

Calls from the units were downloaded and sent to Rob Gration (EcoAerial Environmental Services, Newport VIC) for identification. The files from the recording sites were viewed in Kaleidoscope Pro-analysis software (Wildlife Acoustics, USA), which provides a sonogram display of frequency versus time. Call identification was based on a key developed by comparing the characteristics of bat calls with reference calls from known species recorded across Australia. Identification is largely based on changes to frequency patterns over time, with such changes being characteristic of individual species for most genera. Only those recordings that contained at least two definite and discrete calls were classified as bat calls. For most species, a call sequence of several seconds in duration is required before identification can be made confidently.

6.3. Timing and number of songmetres

Autumn 2021 survey: Sixteen Songmeters were deployed at 16 sites over 30 consecutive nights from 3th March to the 1st April, 2021. Eleven of these produced data and the remaining five were faulty. Recording totalled 330 detector nights or 3,960 bat hours.

Summer 2022 survey: Sixteen Songmetres were deployed at 16 sites over 55 consecutive nights from 5th November to 27th December, 2021. Thirteen of these produced data and the remaining three were faulty. Recording totalled 715 detector nights or 8,580 bat hours.

6.4. Location of bat survey sites

The proposed wind farm site is located within Mount Heemskirk Regional Reserve, Meredith Range Regional Reserve and heathland north and south of Pieman Lake. The study area was divided into two major sections, north and south of Lake Pieman.

The study area is dominated by Buttongrass moorland with areas of heathy vegetation and Smithton Peppermint Forest within the gullies interspersing the higher plateaus of Buttongrass moorland. Lake Pieman occurs between the sites and larger woodland areas are located adjacent to the north and east of the site.

The location and characteristics of the recording sites are described Table 18 and their locations are shown in Figure 8.

Table 18: Bat recorder locations

Survey Site	Habitat/landscape description
1	Adjacent to Granville Harbour Rd, among health land on an elevated area with tea-trees and small Eucalypts.
2	Located in a large clearing, sparse small burnt Eucalyptus, 400m to the south from Big Ben Creek
3	Small hill among health land, patch of large Eucalypts and tall Tea-trees and Melaleucas
4	Adjacent to Heemskirk Rd, majority of surround vegetation was low lying Tea-trees and Melaleucas
5	Located on hill among health land with no other vegetation
6	Located on hill with dense Tea-trees and Eucalyptus on the bottom of the slope along Eme Creek, approximately 250m
7	Located on hill in heath land with some small Tea-trees
8	Adjacent to Heemskirk Rd, with a patch of Eucalyptus and Tea-trees
9	Located on High ridge in Button grass heath land, some small Tea-trees along access track
10	Located on High ridge in Button grass heath land, some small Tea-trees along access track
11	Adjacent to Trial Harbour Rd, in a small stand of Banksias and Tea-trees, approximately 1,500m inland from Southern Ocean.
12	Adjacent to Pieman Rd, primarily heath land with Eucalyptus stands along Owen Meredith River approximately 250m to the north west
13	Located on high ridge in Button grass heath land with no other vegetation near by
14	Located on high ridge in Button grass heath land with no other vegetation near by
15	Located on high ridge in Button grass heath land with no other vegetation near by
16	Located on small hill among dense and tall heath land surrounded by Eucalyptus woodland

6.5. Limitations

The identification of echolocation calls from microbats in south-eastern Australia is facilitated by the fact that many calls are species-specific. Calls that could not be identified definitively were allocated to species complexes comprising a group of species with similar sonogram characteristics.

A further limitation in the use of this technique is that it is not possible to census bat numbers. For example, ten calls of a particular species may be recorded but it is not known if this represents ten individuals of that species or one individual flying past the bat recorder ten times. Therefore, it is not possible to determine utilisation rates, only activity levels.

Occasionally, recording devices such as those used in the survey experience technical difficulties, which are not uncommon. As a result, short periods of time may not be recorded and total hours of recording varies between the different recorders. Weather conditions including severe storms during the recording period may at time interfere with the recording process.

The bat detectors used during this survey sample a limited airspace to approximately 20-30 metres.

Finally, bat activity levels may vary in response to weather variables such as air temperature, relative humidity, barometric pressure, wind speed, direction and gusts and rain, as well moonlight. Typically, bats are found to be less active during the following circumstances:

- During periods of full moon, and when the moon is high in the sky;
- At higher wind speeds over 10 metres per second; and
- During moderate to heavy rainfall.

The identification of echolocation calls from microbats in south-eastern Australia is facilitated by the fact that many calls are species-specific; however, not all species can be consistently or reliably identified using this technique.

Two species complexes were created due to the similarity of calls from a number of species, these complexes are as follows:

- Long Eared Bat Complex – ultrasonic calls of Long-eared Bats (*Nyctophilus* spp.) are difficult to distinguish to species level, and hence are grouped under their generic name. The species that are likely to occur at the wind farm site are Lesser Long Eared Bat (*Nyctophilus geoffroyi*) and Tasmanian Long Eared Bat *(Nyctophilus sherrini)*. These species are not listed as threatened.
- Forest Bat Complex - calls from species of Forest Bats (*Vespadelus* spp.) can be difficult to differentiate and, therefore, some of their calls have been combined into the Forest Bat Complex for the purposes of analysis. The species that are likely to occur at the wind farm site are Large Forest Bat *(Vespadelus darlingtoni),* Little Forest Bat *(V. vulturnus)* Southern Forest Bat *(V. regulus).* None of these species are threatened.

Figure 8: Bat survey points location

Project: Whaleback Ridge Renewable Energy Project
Client: Westcoast Renewable
Date: 2/11/2022

Legend
- Wind farm boundary
- Turbine exclusion zone
- Bat survey points

BAT 1
BAT 2
BAT 3
BAT 4
BAT 5
BAT 6
BAT 7
BAT 8
BAT 9
BAT 10
BAT 11
BAT 12
BAT 13
BAT 14
BAT 15
BAT 16

Tasman Sea
Granville Harbour
Trial Harbour
Zeehan
Zeehan Recreation Reserve
Renison Bell
Murchison Hwy
Zeehan Hwy

N

Metres
0 1,600

Esri, HERE, Garmin, (c) OpenStreetMap contributors, Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community, Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

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6.6. Results of bat surveys

6.6.1. Overview of results

Across the two survey periods (autumn and summer 2021), six species of bats were positively identified to occur on the wind farm site. Six species were confirmed to occur on the site during the autumn 2021 survey and five species (excluding the White-striped Freetail Bat) during the spring/summer 2021 survey. All of the recorded bats were common, secure and widespread species that occur in farmland and woodland habitats throughout Tasmania, eastern and south-eastern Australia (Table 19).

The White-striped Freetail bat (*Austronomus australis*) is distributed throughout mainland Australia, but historically has not been known from Tasmania. The species has recently been recorded (Between 2009 and 2012) in Tasmania during bat call surveys (Cawthen 2013). Gawthen further suggest that this species is a periodic vagrant to Tasmania.

In addition to species above, two species complexes were also recorded during both of autumn 2021 and spring/summer 2021 surveys. Species complexes were from non-threatened species (Table 19).

No threatened bats were recorded during this survey; however, the White-striped Freetail Bat is a species of special interest for wind farm assessments was potentially recorded with four calls over the wind farm site. This species is known to fly at high altitudes and become exposed to operating wind turbines more than other bat species. Since it is considered as a periodic vagrant to Tasmania (see above), it is not expected to occur regularly at the project site.

Bat call images (sonograms) are shown in Appendix 5 for further confirmation of the identity of bat species.

Table 19: Species recorded during the autumn 2021 and spring- summer 2021 survey periods

Scientific name	Common name	Conservation status	Sites detected in	
			Autumn 2021	Spring-summer 2021-2022
Chocolate Wattled Bat	*Chalinolobus morio*	Common, secure	All sites except site 2	sites 1, 2, 4, 12, 16
Eastern Falsistrellus	*Falsistrellus tasmaniensis*	Common, secure	All sites except site 14	sites 1, 2, 3, 4, 5, 9, 13
Gould's Wattled Bat	*Chalinolobus gouldi*	Common, secure	All sites	all sites
Large Forest Bat	*Vespadelus darlingtoni*	Common, secure	All sites	All sites except site 5
Little Forest Bat	*Vespadelus vulturnus*	Common, secure	All sites except 2 & 12	sites 1, 2, 3, 11, 12, 16,
White Striped Freetail Bat*	*Austronomus australis*	Common, secure	Site 1	0
	Species complexes			
Long-eared Bats	*Nyctophilus geoffroyi / N. sheinnil*	Common, secure	All sites	sites 1, 12, 13, 16, 2, 3, 4, 5, 9
Forest Bats	*Vespadelus darlingtoni / V. Regulus / V. vulturnus*	Common, secure	All sites	All sites

* potential record as this species rarely occurs in Tasmania

6.7. Bat activity

A large number of calls was recorded across the recording sites during both of the autumn 2021 and spring-summer 2021 surveys. Bats were common across the wind farm site, with no particular pattern detectable among the various sites. The details of the field data are presented in Appendix 6 and summarised in Table 20.

6.7.1. Autumn 2021

Records of bats during autumn 2021 were made from 11 sites over 30 nights. Six species of common and secure bats were positively identified and two species complexes.

Table 20 shows the average number of calls per night for each of the recorded bat species. Given the lengthy monitoring periods the data has been summarised as number of calls per site and calls per night and used as measure of relative abundance for the purpose of evaluating activity over the wind farm site and to compare abundance of the various species of bats and abundance of each species across different sites.

The most common species during the autumn 2021 survey were as follows:

- Forest Bat Complex, comprising 58.2 % of all bat calls;
- Large Forest Bat, comprising 17.6 %; and
- Gould's wattled Bat, comprising 17.1 %.

With all other species recording either less than 1.0 % (rare) or 1.0 to 3.1 percent of all calls (moderately abundant) (Table 20).

All bat species recorded during autumn 2021 were common and none was considered as threatened species. The White-striped Freetail Bat, however, is a species of concern as it flies at turbine height. This species is a rare vagrant to Tasmania and the call analysis was therefore not conclusive. The abundance of this species was very low and (0.1% of all bat calls).

6.7.2. Summer 2021–22

Records of bats during spring-summer 2021 were made from 13 sites over 55 nights. Five species of common and secure bats were positively identified and two species complexes (Table 20).

The number of calls for each of the recorded bat species are shown in Table 20 using the number of calls per site and calls per night as measure of relative abundance for the purpose of evaluating activity over the wind farm site and to compare abundance of the various species of bats.

The most common species during spring-summer 2021 survey were as follows:

- Gould's wattled Bat, comprising 52.7 % of all bat calls;
- Forest Bat Complex, comprising 36.1 %; and
- Large Forest Bat, comprising 8.6 %.

With all other species recording either less than 1.0 percent (rare species) or between 1.0 percent and 3.2 percent of all calls (moderately abundant).

All bat species recorded during spring-summer 2021 were common and none was considered as threatened species. The White-striped Freetail Bat, was not recorded during the summer 2021 survey.

Table 20: Summary of bat activity (relative abundance) recorded across the Whaleback Ridge Wind Farm

Species of bats	Autumn 2021 11 sites - 30 nights			Summer 2022 13 sites – 55 nights		
	Average calls/site*	Average calls /night**	% Attributed to species	Average calls/site*	Average calls /night**	% Attributed to species
Chocolate Wattled Bat	10.7	3.9	1.3	2.0	0.5	0.3
Eastern Falsistrellus	26.5	9.7	3.2	1.1	0.3	0.1
Gould's Wattled Bat	143.8	52.7	17.1	409.8	96.9	52.7
Large Forest Bat	147.6	54.1	17.6	67.1	15.9	8.6
Little Forest Bat	3.5	1.3	0.4	13.1	3.1	1.7
Long-eared Bat complex	18.1	6.6	2.2	4.0	0.9	0.5
Forest Bat complex	489.1	179.3	58.2	281.2	66.5	36.1
White-striped Freetail Bat	0.4	0.1	0.1	0.0	0.0	0.0

Notes: * over all nights, ** for all sites

6.7.3. Seasonal comparison

The dominant bat species were the same at both survey seasons, with the highest activity originated from Gould's Wattled Bat, Large Forest Bat, and Forest Bats Complex (Figure 9). However, the order of dominance was different, Gould's Wattled bat was more common and active in spring- summer 2021 than the other two dominant species. In autumn 2021, the Forest Bats Complex was by far the most active bat dominating the other two species. Seasonal changes in bat activity and/or abundance is related to a complex of factors, mostly related to food preferences and availability, stage in the breeding cycle, swarming behaviour and change of roost sites and availability of suitable habitats and intact woodlands.

The distribution of bats across the various habitats (recording sites) within the wind farm based on the number of bats present and active in the area is shown in Figure 10. Most of the calls were recorded at sites 1, 12 and 16 during both surveys, while the remaining recording sites over the ridges were rather similar and recorded much lower levels of bat activity.

The reasons behind the concentration of bat activity over certain recording site is most likely related to the presence of suitable habitat surrounding the sites. While site 1 was along Granville Road, on a small ridge and close to a patch of roadside vegetation, the other two sites (12 and 16) were adjacent to a large patch of forest, providing ample habitat for roosting and feeding.

Figure 9: Comparison of bat activity (calls per night) by species between the two survey seasons

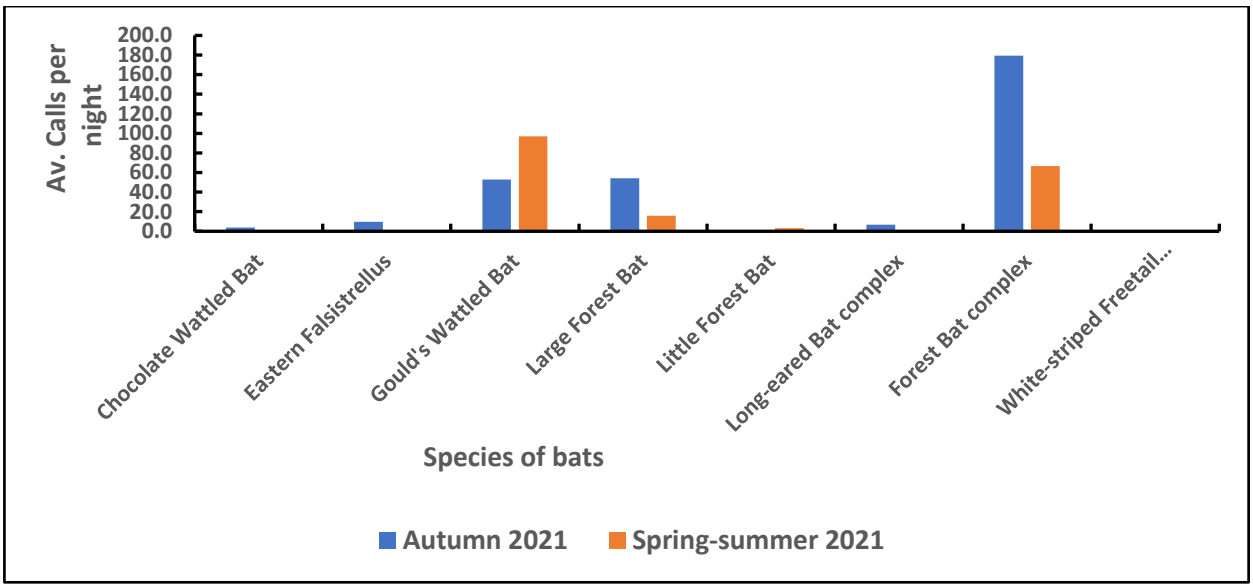
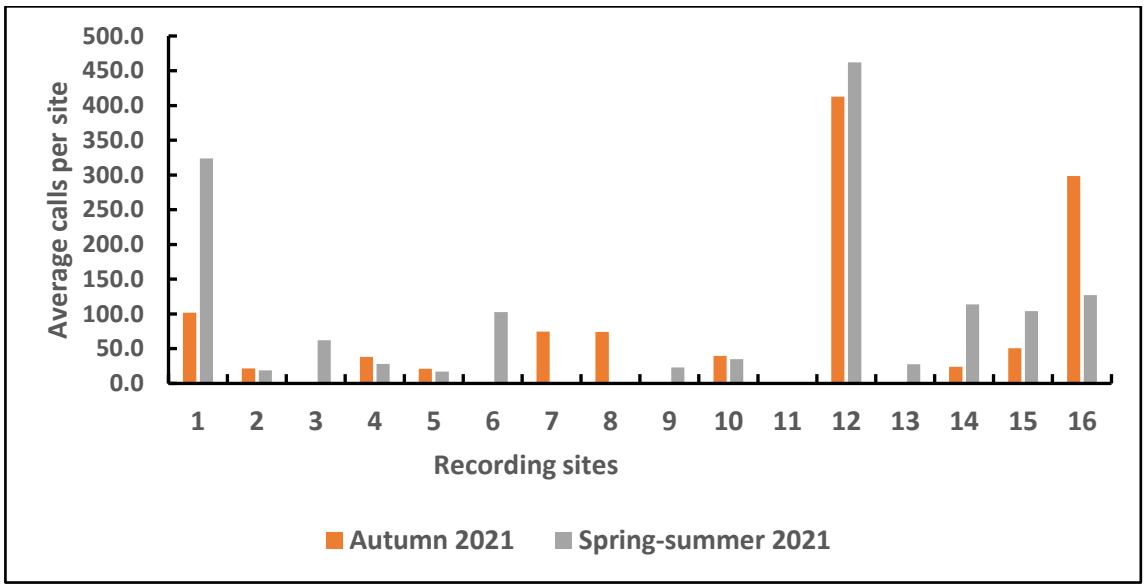


Figure 10: Comparison of bat activity (calls per site) between sites and the two survey seasons



6.8. Summary and Conclusions

- All bat species known to inhabit Tasmania or to be vagrants to Tasmania were detected except for the Southern Forest Bat. Due to the difficulty of positivity identifying its call, this species has likely been detected as part of the Forest Bats complex.
- Bat recording was undertaken over two seasons; autumn 2021 and spring-summer 2021. Eleven songmetres recorded bat calls over 30 nights in autumn 2021 and 13 songmeters recorded over 55 nights in summer 2021.
- Six species of bats were positively identified to occur on the wind farm site. Six species were confirmed to occur on the site during the autumn 2021 survey and five species during the spring-summer 2021 survey.
- All of the recorded bats were common, secure and widespread that occur in farmland and woodland habitats throughout Tasmania, except for the White-striped Freetail Bat. The White-striped Freetail Bat is considered as a species of concern as it flies at height and could collide with turbines. This species is a rare vagrant to Tasmania and the call analysis was therefore not conclusive. The abundance of this species was very low and (0.1% of all bat calls).
- Dominant bat species utilising the wind farm site were similar between the two survey seasons, with Gould's Wattled Bat, Large Forest Bat and Forest Bats Complex.
- A high nightly variability in bat activity was observed at survey site 12, such spikes in bat activity maybe a result of a mating swarms. All three species of forest bats begin mating in autumn and bats are often known to gather in large numbers during mating periods. These spikes in activity occurred on warm dry nights when foraging would be optimal.
- Most of the common bat species are known to fly close to the ground or within canopy heights and would not be susceptible to impacts from the new model designs of wind turbines due to the increased height of the rotor swept area.

7. References

Bell PJ and Mooney NJ 1999. The Wedge-tailed Eagle Recovery Plan 1998-2003. Tasmanian Parks and Wildlife Service, Hobart.

Biosis Research Pty Ltd 2002, Avifauna Monitoring Survey – Spring 2001 & Autumn 2002: Heemskirk Wind Farm Feasibility Study, Project 2779, report for Hydro Electric Commission, Port Melbourne, Victoria.

BirdLife International 2021, Datazone: Orange-bellied Parrot Neophema chrysogaster, viewed on 17 May 2021, www.datazone.birdlife.org.

BL&A (Brett Lane & Associates Pty Ltd) 2012, Granville Wind Farm – Matters of National Environmental Significance, Referral under the EPBC Act, Report No. 11186 (5.8), BLA, Hawthorn, Victoria, October 2012.

Brown WE & Mooney NJ 1997. Modelling of Nesting Habitat of the Wedge-tailed Eagle (*Aquila audax fleayi*) in Tasmania. *Unpublished Report to the Tasmania RFA Environment and Heritage Technical Committee, Commonwealth of Australia and State of Tasmania*. Unpublished Report to the Tasmania RFA Environment and Heritage Technical Committee, Commonwealth of Australia and State of Tasmania, Hobart.

Brown, PB & Wilson, RI 1980, 'A survey of the Orange-bellied Parrot *Neophema chrysogaster* in Tasmania, Victoria and South Australia'. Report for World Wildlife Fund (Australia), Tasmanian National Parks and Wildlife Service, [Hobart].

Clean Energy Council 2018. Best Practice Guidelines – For Implementation of Wind Energy Projects in Australia, June 2018.

Corben, C, Roberts, G, Smyth, A 1982, Roosting of a White-throated Needletail. *Sunbird*. **12**,47-48.

Day, N 1993, Tree perching and presumed roosting of White-throated Needletails *Hirundapus caudacutus*. *Australian Bird Watcher*. **15**, 43-44.

DAWE (Department of Agriculture, Water and Environment) 2021, EPBC Act Protected Matters Search Tool, viewed 18 May 2021, www.environment.gov.au.

DCCEEW (Department of Climate Change, Energy, the Environment and Water) 2022, Aquila audax fleayi — Tasmanian Wedge-tailed Eagle, Wedge-tailed Eagle (Tasmanian), Species Profile and Threats Database, https://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=64435.

DEWHA 2010, Survey Guidelines for Australia's threatened bats, Canberra.

DPIPWE 2021, Natural Value Atlas of Tasmania, Hobart.

Department of Infrastructure, Local Government and Planning 2017. State Code 23: Wind farm development.

Forest Practices Authority 2006, Eagle nest searching, activity checking and nest management', Fauna Garnett S.T., Szabo JK & Dutson G. 2011, *The Action Plan for Australian Birds 2010*. CSIRO Publishing, Collingwood, Victoria.

Gawthen L (2013), White-striped Freetail Bat in Tasmania-resident, vagrant or climate change migrant, Australian Mammalogy, 35(2), 251-254.

GHD 2021, Robbins Island Renewable Energy Park, Development Proposal and Environmental Management Plan, prepared for UPC Robbins Island Pty Ltd, December 2021.

Higgins PJ (Ed) 1999, *Handbook of Australian, New Zealand and Antarctic Birds,* Volume 4, Parrots to Dollarbirds, Oxford University Press, Melbourne.

Hull CL, Stark EM, Peruzzo S & Sims CC 2013. Avian collisions at two wind farms in Tasmania, Australia: taxonomic and ecological characteristics of colliders versus noncolliders. *New Zealand Journal of Zoology*, 40, 47-62.

Mooney NM & Holdsworth M 1991. The Effects of Disturbance on Nesting Wedge-tailed eagles (*Aquila audax fleayi*) in Tasmania. *Tasforests,* 3, 15-31.

Mooney NM 2022. Whaleback Ridge Renewable Energy Project – Preliminary Eagle Nest Searches, Tasmania.

Nankervis DL 2010. Spatial patterns of genetic and morphological variation in the wedge-tailed eagle (*Aquila audax*). University of Tasmania.

Nature Advisory Pty Ltd 2023, Whaleback Ridge Renewable Energy Project – Desktop Flora and Fauna Assessment, June 2023, Hawthorn East, Victoria.

Olsen PD 2005. The Wedge-tailed Eagle. CSIRO Publishing, Collingwood.

Orange-bellied Parrot Recovery Team, 2006, 'National Recovery Plan for the Orange-bellied Parrot (*Neophema chrysogaster*)', Department of Primary Industries and Water (DPIW), Hobart.

Smales, I and Muir, S 2005, 'Modelled cumulative impacts on the Tasmanian Wedge-tailed Eagle of wind farms across the species' range'. Report for Department of Environment and Heritage.

Threatened Species Scientific Committee 2019. Conservation Advice *Hirundapus caudacutus* White-throated Needletail, Department of the Environment and Energy, Canberra.

Threatened Species Section DPIW 2006. Threatened Tasmanian Eagles Recovery Plan 2006-2010. Department of Primary Industries and Water, Hobart.

Tarburton, MK 1993, Radiotracking a White-throated Needletail to roost. *Emu*, **93**:121–124.

University of Melbourne 2004. Linking landscape ecology and management to population viability analysis - Report 2: Population viability analyses for eleven forest dependent species. Report for Forestry Tasmania.

Wildcare Tasmania, 2021, News Archive: 'Braving dire West Coast weather forecasts – FoOBP Autumn survey 2021', viewed 17 May 2021, www.wildcaretas.org.au posting 5 May 2021.

8. Appendices

Appendix 1: Raw data for the Bird Utilisation Surveys

A: Count and height distribution of bird species at impact survey points during autumn 2021 surveys

Species/ Observation points	1		2		3		4		5		6		7		8		9		10		11		14		15		16		17		18		19		20		Totals				% Imp
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	C	Tot.	
White-throated Needletail		6	8			12											25		30		2		4		16		20						4				109	18	0	127	24.9
Crescent Honeyeater	9		5		15		10				11		14		4						15		14						4						3		104	0	0	104	20.4
Tasmanian Thornbill	15				1						7				3														2								28	0	0	28	5.5
Striated Fieldwren	3		3		1				5		4				2		3		1		3		1						1								27	0	0	27	5.3
Australian Pipit									2										3		1				2								7		12		27	0	0	27	5.3
Superb Fairywren	5				11						1				4																						21	0	0	21	4.1
Yellow-throated Honeyeater					16										4																						20	0	0	20	3.9
Welcome Swallow									8		6		1		1				2				1														19	0	0	19	3.7
Tree Martin	2						1		3		3		1		3																		2				15	0	0	15	2.9
Forest Raven	4	7																									2									2	6	9	0	15	2.9
Dusky Robin	5				3		1								4								1												1		15	0	0	15	2.9
Green Rosella					3		3						3		2								2														13	0	0	13	2.5
Southern Emu-wren							3				6												1														10	0	0	10	2.0
New Holland Honeyeater					2		6						2																								10	0	0	10	2.0
Beautiful Firetail	1				1				1		1				5																						9	0	0	9	1.8
Ground Parrot	1										1		1																				1		2		6	0	0	6	1.2
Blue-winged Parrot		4		1			1																														1	5	0	6	1.2
Yellow-tailed Black-Cockatoo											2			2																						2	2	0	4	0.8
Tasmanian Scrubwren	1												1		2																						4	0	0	4	0.8
Flame Robin															4																						4	0	0	4	0.8
Olive whistler					1										2																						3	0	0	3	0.6
Grey Shrike-thrush	1														2																						3	0	0	3	0.6
Grey Fantail															3																						3	0	0	3	0.6
Eastern Spinebill					1																2																3	0	0	3	0.6
Brown Falcon																			1														1		1		2	1	0	3	0.6
Swamp Harrier																																	2				0	2	0	2	0.4
Silvereye																					2																2	0	0	2	0.4
Black Currawong					1												1																				2	0	0	2	0.4
Wedge-tailed Eagle							1																														1	0	0	1	0.2
European Goldfinch															1																						1	0	0	1	0.2
Collared Sparrowhawk							1																														1	0	0	1	0.2
Brush Bronzewing					1																																1	0	0	1	0.2
Brown Goshawk																															1						1	0	0	1	0.2
Grand Total	**45**	**19**	**16**	**1**	**57**	**12**	**27**	**0**	**19**	**0**	**42**	**0**	**23**	**2**	**46**	**0**	**29**	**0**	**37**	**0**	**25**	**0**	**24**	**0**	**18**	**0**	**22**	**0**	**7**	**0**	**1**	**0**	**14**	**3**	**19**	**2**	**471**	**39**	**0**	**510**	**100**

Note: A = below RSA height; B = At RSA height; C = above RSA height

B: Count and height distribution of bird species at impact survey points during summer 2022 surveys

Species/ Observation points	1		2		3		4		5		6		7		8		9		10		11		14		15		16		17		18		19		20		Totals				% Imp.
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	C	Tot.	
Striated Fieldwren	3		4		5		1				5		6		9		3				7		1				1		1		1		1				48	0	0	48	23.2
Southern Emu-wren	4				4						5		3		1						2		1														20	0	0	20	9.7
Welcome Swallow					1				3		4		3		5						4																20	0	0	20	9.7
Yellow-throated Honeyeater	1				1 1										3								1												2		18	0	0	18	8.7
Australian Pipit	1								2										3						2								1		8		17	0	0	17	8.2
Crescent Honeyeater	4				2		4						2								1														1		14	0	0	14	6.8
Superb Fairywren							4								6																						10	0	0	10	4.8
Tasmanian Thornbill	9						1																														10	0	0	10	4.8
Grey Shrike-thrush					3		2								1																						6	0	0	6	2.9
Dusky Robin					5																																5	0	0	5	2.4
Brown Falcon									1																		2		1								4	0	0	4	1.9
Beautiful Firetail											1				2																						3	0	0	3	1.4
Blue-winged Parrot											1						1										1										3	0	0	3	1.4
Eastern Spinebill					3																																3	0	0	3	1.4
Forest Raven							1								2																						3	0	0	3	1.4
Ground Parrot											1		1																				1				3	0	0	3	1.4
Swamp Harrier	1						1		1																												3	0	0	3	1.4
Tree Martin													1		1		1																				3	0	0	3	1.4
Black-faced Cuckoo-shrike					2																																2	0	0	2	1.0
European Goldfinch							1								1																						2	0	0	2	1.0
White-fronted Chat																					2																2	0	0	2	1.0
Yellow-tailed Black Cockatoo													2																								2	0	0	2	1.0
Black Currawong																																			1		1	0	0	1	0.5
Green Rosella					1																																1	0	0	1	0.5

Species/ Observation points	1		2		3		4		5		6		7		8		9		10		11		14		15		16		17		18		19		20		Totals				% Imp.
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	C	Tot.	
New Holland Honeyeater							1																														1	0	0	1	0.5
Dusky Robin															1																						1	0	0	1	0.5
Tasmanian Scrubwren															1																						1	0	0	1	0.5
Wedge-tailed Eagle						1																															0	1	0	1	0.5
Grand Total	23	0	4	0	37	1	16	0	7	0	17	0	18	0	33		5	0	3	0	16	0	3	0	2	0	4	0	2	0	1	0	3	0	12	0	206	1	0	207	100

Note: A = below RSA height; B = At RSA height; C = above RSA height

C: Count and height distribution of bird species at the reference survey points during autumn 2021

Species / Observation points	R1		R2		Totals				% Importance
	A	B	A	B	A	B	C	Total	
Crescent Honeyeater	2		34		36	0	0	36	48.6
Yellow-throated Honeyeater	3		6		9	0	0	9	12.2
Southern Emu-wren	5		2		7	0	0	7	9.5
Superb Fairywren			4		4	0	0	4	5.4
Australian Pipit	3				3	0	0	3	4.1
Green Rosella			3		3	0	0	3	4.1
Striated Fieldwren	2		1		3	0	0	3	4.1
Yellow-tailed Black-Cockatoo			3		3	0	0	3	4.1
Dusky Robin	2				2	0	0	2	2.7
Black Currawong			1		1	0	0	1	1.4
Flame Robin	1				1	0	0	1	1.4
Ground Parrot	1				1	0	0	1	1.4
Wedge-tailed Eagle	1				1	0	0	1	1.4
Totals	20	0	54	0	74	0	0	74	100

Notes: A = below RSA height; B = At RSA height; C = above RSA height

D: Count and height distribution of bird species at the reference survey points during summer 2022

Species / Observation points	R1		R2		Totals				% Imp.
	A	B	A	B	A	B	C	Tot.	
Superb Fairywren			5		5	0	0	5	22.7
Crescent Honeyeater			4		4	0	0	4	18.2
Tree Martin	4				4	0	0	4	18.2
Striated Fieldwren	3				3	0	0	3	13.6
Green Rosella			2		2	0	0	2	9.1
Grey Fantail			2		2	0	0	2	9.1
Ground Parrot			1		1	0	0	1	4.5
Southern Emu-wren	1				1	0	0	1	4.5
Grand Total	8	0	14	0	22	0	0	22	100.0

Notes: A = below RSA height; B = At RSA height; C = above RSA height

Appendix 2: Raw data for the raptor Surveys

A. Raptor survey field data, autumn 2021

Observer Initials	Flight No.	Date	Start time	End time	Site Number	Obs. No.	Species	No of Birds	Age	Height at first sight (m)	Flight height range (m)	Direction	Behaviour	Comments
CD	1	4/03/2021	15:32	15:34	Incidental	1	BF	1	Adult	30	20-50	South	Flapping	
AM	2	3/04/2021	16:05	16:07	Incidental		WTE	2		25	10			
CD	3	5/03/2021	14:49	15:03	9	2	WTE	2	Adult	40	1-80	West	Soaring (circling)	A pair of adult WTE observed soaring over heathland, before flying west toward wind farm where they did a territorial display over the woodland.
PSL	4	5/03/2021	17:30	17:31	Incidental	3	WTE	1	Juvenile	6	1-20	East	Flapping	
CD	5	6/03/2021	11:43	11:46	12	4	WTE	2	Adult	100	10-120	North	Gliding (straight line)	A pair of eagles gliding along the ridge before landing in a dead tree.
CD	6	6/03/2021	11:57	12:11	Incidental	5	WTE	2	Adult	50	40-200	South	Soaring (circling)	A pair seen soaring over Reece Dam
CD	7	6/03/2021	12:29	12:37	13	6	WTE	1	Adult	20	20-80	North-east	Soaring (circling)	Single bird seen soaring in the distance. Unsure age of bird.
CD	8	7/03/2021	12:59	13:04	11	7	WTE	2	Adult	150	150-300	West	Soaring (circling)	A pair observed soaring increasing higher into the sky before moving out of site
AM	9	7/03/2021	9:00	9:01	Incidental		WTE	1	Adult	15	10-20	East	Gliding (straight line)	
CD	10	8/03/2021	11:34	11:40	4	8	SH	1	Adult	80	80150	North-east	Soaring (circling)	
CD	11	8/03/2021	15:15	15:13	4	9	SH	1	Adult	80	80120	North-east	Soaring (circling)	
CD	12	8/03/2021	15:14	15:15	4	10	BF	1	Adult	60	6080	South-east	Flapping	
AM	13	9/03/2021	13:35	13:36	Incidental		WTE	1	Adult	10	10-20	South-west	Gliding (straight line)	Incidental
AM	14	9/03/2021	13:36	13:37	Incidental		WTE	1	Adult	15	10-20		Gliding (straight line)	Incidental
AM	15	9/03/2021	14:25	14:27	Incidental		WTE	1	Adult	15	10-20	South	Gliding (straight line)	Incidental
CD	16	10/03/2021	10:54	10:56	3	12	BG	1	Adult	80	80-160	North-west	Soaring (circling)	
PSL	17	11/03/2021	8:45	8:45	Incidental	13	CS	1	Adult	45	40-50	North	Flapping	Adult female
AM	18	4/03/2021	16:10	16:11	Incidental		WTE	2	Adult	35	30-40	South-east	Gliding (straight line)	

Note: BF - Brown Falcon, SH - Swamp Harrier, WTE - Wedge-tailed Eagle, BG - Brown Goshawk, CS - Collard Sparrowhawk

B. Raptor survey field data, summer 2022

Observer Initials	Flight No.	Date	Start time	End time	Site Number	Obs. No.	Species	No of Birds	Age	Height at first sight (m)	Flight height range (m)	Direction	Behaviour	Comments
AT	1	20/01/2022	11:45	11:48	3	1	WTE	1	Adult	150	80-150	SW	Gliding, diving	Directional flight, disappeared behind ridge
GM	13	25/01/2022			Incidental		WTE	2		400	300-1000	Parallel to ridge	Soaring	
AT	3	21/01/2022	16:30	16:31	5	3	BF	1	Adult	60		E	Flapping	Attacking SH
AT	6	23/01/2022	10:00	10:02	Incidental	6	BF	2	Adult	80	60-121	E	circling soaring	
AT	7	24/01/2022	11:25	11:25	Incidental	7	BF	1	Adult	0		E	Perched	
GM		21/01/2022			15		BF	1		50	20,80	Parallel to ridge	Hovering	
GM		23/01/2022			9		BF	1		100	50,150		Hovering	
GM		23/01/2022			10		BF	2		100	50,150		Displaying	
GM		24/01/2022			10		BF	2		100	50,200	Circling	Soaring	
GM		26/01/2022			Incidental		BF	1		100	20,150	Parallel to ridge	Hovering	
GM		26/01/2022			Incidental		BF	1		50	20,80	Circling	Hovering	
AT	2	21/01/2022	10:00	10:02	1	2	SH	1	Adult	10	10-150	S	Soaring	
AT	4	21/01/2022	16:30	16:31	5	4	SH	1	Adult	60	20-100	E	soaring	Circling, foraging
AT	5	22/01/2022	10:00	10:02	Incidental	5	SH	1	Adult	80	60-120	E	circling soaring	
GM		19/01/2022			18		SH	2			0,20	Circling	Displaying	
GM		19/01/2022			4		SH	1		50	10,60	Parallel to ridge	Gliding	
GM		20/01/2022			18		SH	1		20	0,30	Parallel to ridge	Soaring	
GM		20/01/2022			4		SH	1		60	40,100	Parallel to ridge	Gliding	
GM		22/01/2022			Incidental		SH	1		100	50,150	Circling	Soaring	
GM		20/01/2022			Incidental		WBSE	1	Juv	100	50,150	Away	Gliding	
GM		20/01/2022			Incidental		WBSE	1	Adult	100	60,150	Circling	Soaring	
GM		20/01/2022			Incidental		WBSE	2	Ad. & Juv	200	100,300	Circling	Displaying	
GM		25/01/2022			Incidental		GH or CS	1		200	100,300	Parallel to ridge	Soaring	

Note: I – Incidental; BF - Brown Falcon, SH - Swamp Harrier, WTE - Wedge-tailed Eagle, BG - Brown Goshawk, CS - Collard Sparrowhawk

Appendix 3: Orange-bellied Parrot records from the Natural Values Atlas from the search region

Common name	Zone (GDA94)	Easting	Northing	Positional Accuracy (m)	Location	Date	Date accuracy
Orange-bellied Parrot	55	355112	5343683	1000		03-Mar-1974	Day
Orange-bellied Parrot	55	355112	5343683	1000		30-Mar-1974	Day
Orange-bellied Parrot	55	355367	5339656	18500		17-Mar-1978	Unknown
Orange-bellied Parrot	55	356412	5332083	1000		18-Mar-1978	Day
Orange-bellied Parrot	55	355112	5343683	1000		14-Mar-1980	Day
Orange-bellied Parrot	55	348712	5356483	1000		24-Mar-1981	Day
Orange-bellied Parrot	55	348712	5356483	1000		11-Apr-1981	Day
Orange-bellied Parrot	55	355112	5343683	200		24-Feb-1983	Day
Orange-bellied Parrot	55	355012	5343003	500		23-Feb-1991	Day
Orange-bellied Parrot	55	336412	5369383	500		14-Oct-1992	Day
Orange-bellied Parrot	55	356412	5332083	100	Ocean Beach, Strahan	10-Jan-1999	Decade
Orange-bellied Parrot	55	348712	5356483	100	Near Trial Harbour	10-Jan-1999	Decade
Orange-bellied Parrot	55	336412	5379383	100	Granville Harbour	10-Jan-1999	Decade
Orange-bellied Parrot	55	347913	5357270	50	Trial Harbour	18-Mar-2002	Day
Orange-bellied Parrot	55	333269	5390507	-1	Pieman River, Corinna to Mouth	01-Mar-2015	Day
Orange-bellied Parrot	55	358646	5331512	-1	Strahan Airfield	23-Oct-2015	Day
Orange-bellied Parrot	55	358694	5331669	50		24-Mar-2019	Day
Orange-bellied Parrot	55	358565	5331810	20	Strahan Aerodrome	10-Apr-2021	Day
Orange-bellied Parrot	55	358399	5331509	20	Strahan Aerodrome	10-Apr-2021	Day
Orange-bellied Parrot	55	358678	5329869	20	Macquarie Heads Road, south of Strahan	10-Apr-2021	Day

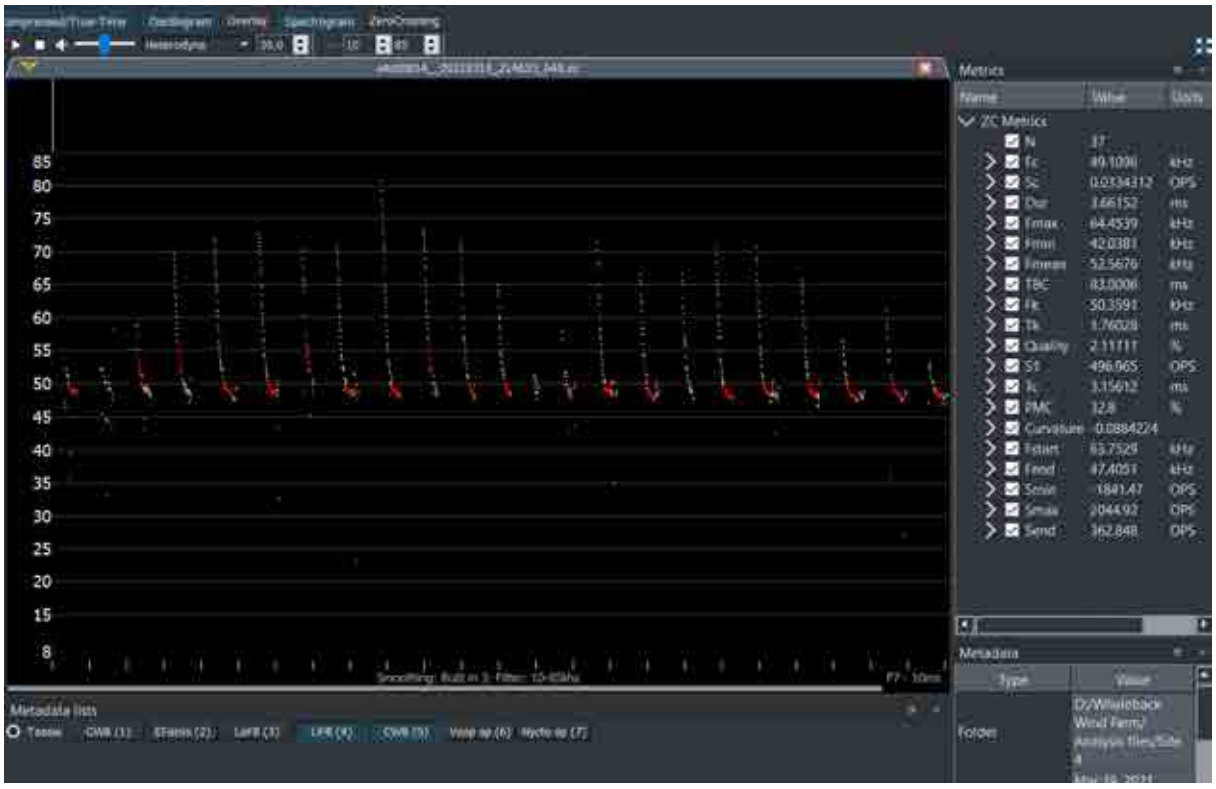
Appendix 4: Orange-bellied Parrot survey times and locations, April 2022

Survey point	Date	Start time	End time	Duration of survey	Zone	Easting	Northing
1	12-Apr	9:10	9:25	0:15	55G	340010	5365138
2	12-Apr	9:35	9:50	0:15	55G	340273	5364622
3	12-Apr	10:05	10:20	0:15	55G	341901	5364727
4	12-Apr	10:34	10:49	0:15	55G	342700	5365691
5	12-Apr	11:20	11:35	0:15	55G	341975	5364375
6	12-Apr	12:03	12:18	0:15	55G	342135	5362954
7	12-Apr	13:00	13:15	0:15	55G	342356	5362973
8	12-Apr	13:27	13:42	0:15	55G	344491	5363630
9	12-Apr	13:54	14:09	0:15	55G	343447	5363021
10	12-Apr	14:22	14:37	0:15	55G	343213	5362111
11	12-Apr	14:55	15:10	0:15	55G	344190	5361830
12	12-Apr	15:15	15:30	0:15	55G	345251	5361867
13	12-Apr	15:45	16:00	0:15	55G	346035	5361166
14	12-Apr	16:12	16:27	0:15	55G	346285	5358778
15	12-Apr	16:31	16:46	0:15	55G	346083	5358537
16	13-Apr	10:17	10:32	0:15	55G	349143	5359138
17	13-Apr	10:43	10:58	0:15	55G	349268	5359569
18	13-Apr	11:07	11:22	0:15	55G	348389	5359867
19	13-Apr	11:30	11:45	0:15	55G	348067	5360498
20	13-Apr	11:57	12:12	0:15	55G	347306	5361410
21	13-Apr	12:22	12:37	0:15	55G	346736	5360924
22	13-Apr	12:55	13:10	0:15	55G	346819	5361087
23	13-Apr	13:39	13:54	0:15	55G	347799	5357350
24	13-Apr	14:02	14:17	0:15	55G	348096	5357439
25	13-Apr	14:25	14:40	0:15	55G	347196	5357388

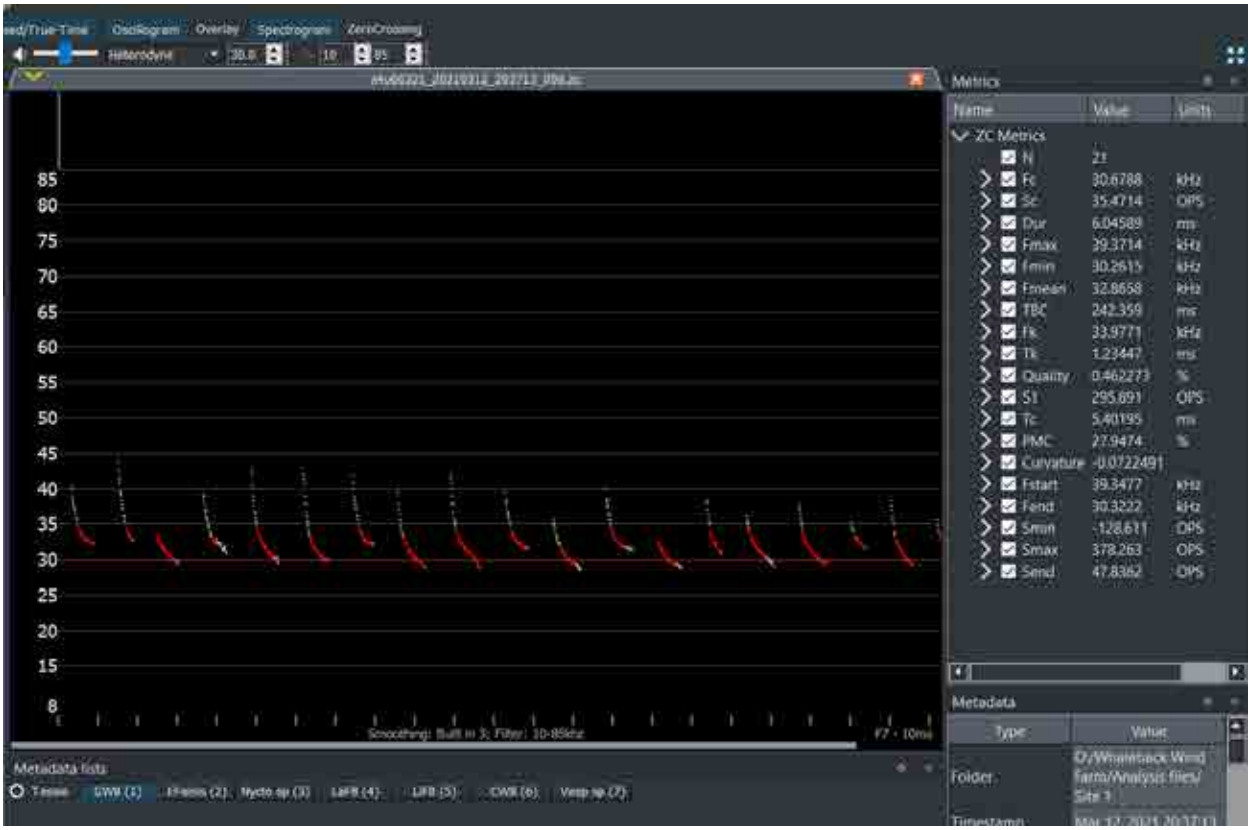
Survey point	Date	Start time	End time	Duration of survey	Zone	Easting	Northing
26	13-Apr	14:50	15:05	0:15	55G	347645	5357822
27	14-Apr	14:15	14:30	0:15	55G	348157	5367521
28	14-Apr	14:40	14:55	0:15	55G	348073	5368222
29	14-Apr	15:11	15:26	0:15	55G	348137	5358266
30	14-Apr	15:40	15:55	0:15	55G	344049	5369113
31	14-Apr	16:05	16:20	0:15	55G	342211	5368519
32	14-Apr	16:27	16:42	0:15	55G	335774	5370293
(33)	25-Apr	12:35	12:50	0:15	55G	343457	5367063
HL1	26-Apr	9:35	10:05	0:30	55G	336200	5369392
HL2	26-Apr	10:15	10:45	0:30	55G	336416	5369266
HL3	26-Apr	11:50	12:20	0:30	55G	337711	5368455
HL2	26-Apr	13:51	14:21	0:30	55G	336416	5369266
HL4	26-Apr	16:10	16:40	0:30	55G	335093	5371085
HL5	27-Apr	7:00	8:30	1:30	55G	336405	5369215
HL6	27-Apr	16:00	17:20	1:20	55G	339877	5365349

Appendix 5: Bat call images (sonograms)

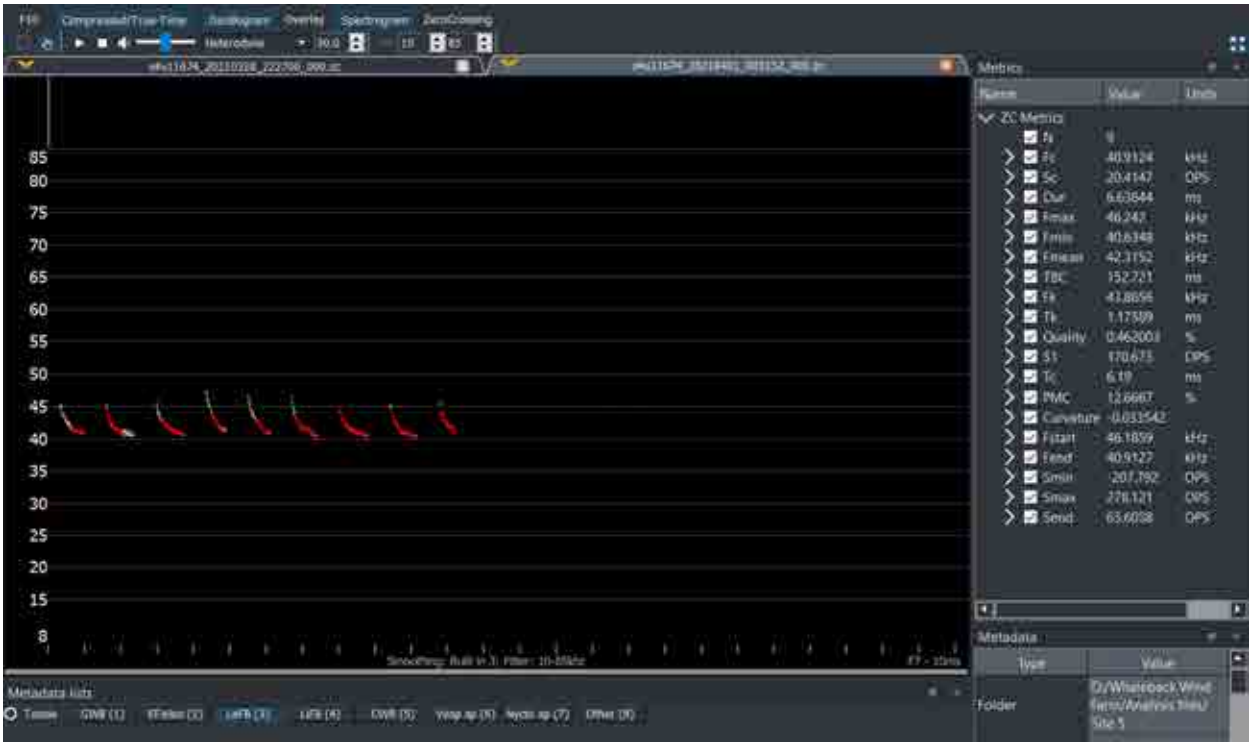
Chocolate Wattled Bat



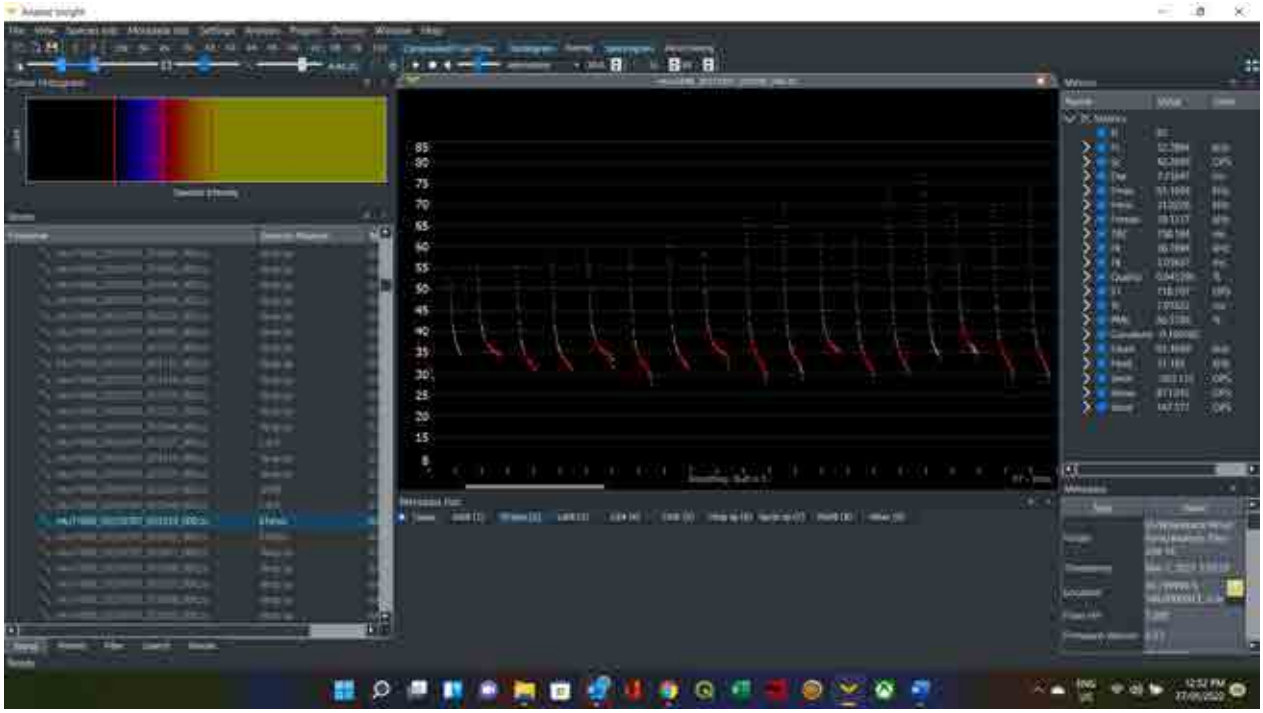
Little Forest Bat



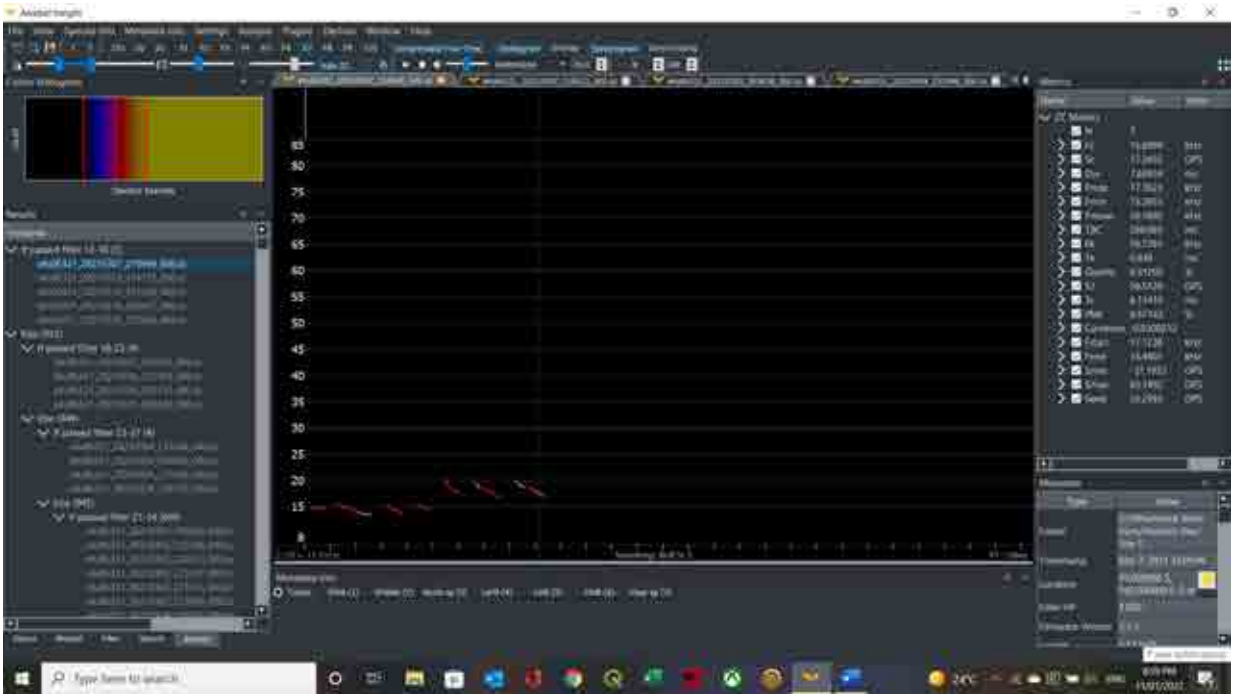
Gould's Wattled Bat



Large Forest Bat



Eastern Falsistrelle



White-striped Freetail Bat (potentially) - acknowledged as a vagrant in Tasmania

Appendix 6: Bat activity data recorded across Whaleback Ridge Wind Farm

Autumn 2021 bat activity (11 songmeters over 30 recording nights)

Species of bats	Sites of recording											Average calls/site	Average calls /night
	1	2	4	5	7	8	10	12	14	15	16		
Chocolate Wattled Bat	1	0	17	3	1	11	7	8	2	3	65	10.7	3.9
Eastern Falsistrellus	31	2	5	3	2	2	19	22	0	10	196	26.5	9.7
Gould's Wattled Bat	504	55	78	55	21	181	233	256	22	48	129	143.8	52.7
Large Forest Bat	79	61	32	90	354	133	16	84	132	152	491	147.6	54.1
Little Forest Bat	7	0	7	3	2	3	12	0	1	3	1	3.5	1.3
Long-eared Bat complex	15	15	78	7	4	1	13	12	1	10	43	18.1	6.6
Forest Bat complex	169	41	86	8	213	261	13	2921	30	177	1461	489.1	179.3
White-striped Freetail Bat	4	0	0	0	0	0	0	0	0	0	0	0.4	0.1

Spring-summer 2022 bat activity (13 songmeters over 55 recording nights)

Species of Bats	Sites of recording													Average calls /site	Average calls /night
	1	2	3	4	5	6	9	10	12	13	14	15	16		
Chocolate Wattled Bat	17	2	0	2	0	0	0	0	4	0	0	0	1	2.0	0.5
Eastern Falsistrellus	6	1	2	2	1	0	1	0	0	1	0	0	0	1.1	0.3
Gould's Wattled Bat	1260	33	239	118	106	706	99	157	1272	181	618	467	71	409.8	96.9
Large Forest Bat	27	49	27	28	0	5	27	75	122	6	163	234	109	67.1	15.9
Little Forest Bat	11	1	1	0	0	0	0	1	66	0	0	0	90	13.1	3.1
Long-eared Bat complex	6	1	6	15	6	0	1	0	5	1	0	0	11	4.0	0.9
Forest Bat complex	938	46	161	31	6	7	32	12	1766	3	16	29	608	281.2	66.5

Appendix D Whaleback Ridge Renewable Energy Project Preliminary Searches for Eagle Nests

Preliminary searches for eagle nests on the site of the proposed Whaleback Ridge Renewable Energy Project.

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August 2023

INTRODUCTION

The project area at Whaleback Ridge Renewable Energy Project (the project) in western Tasmania (Fig 1.) has been proposed as a location to develop a large-scale wind farm development for a number of reasons, principal among them being an anticipated low risk to eagles in comparison to other parts of Tasmania.

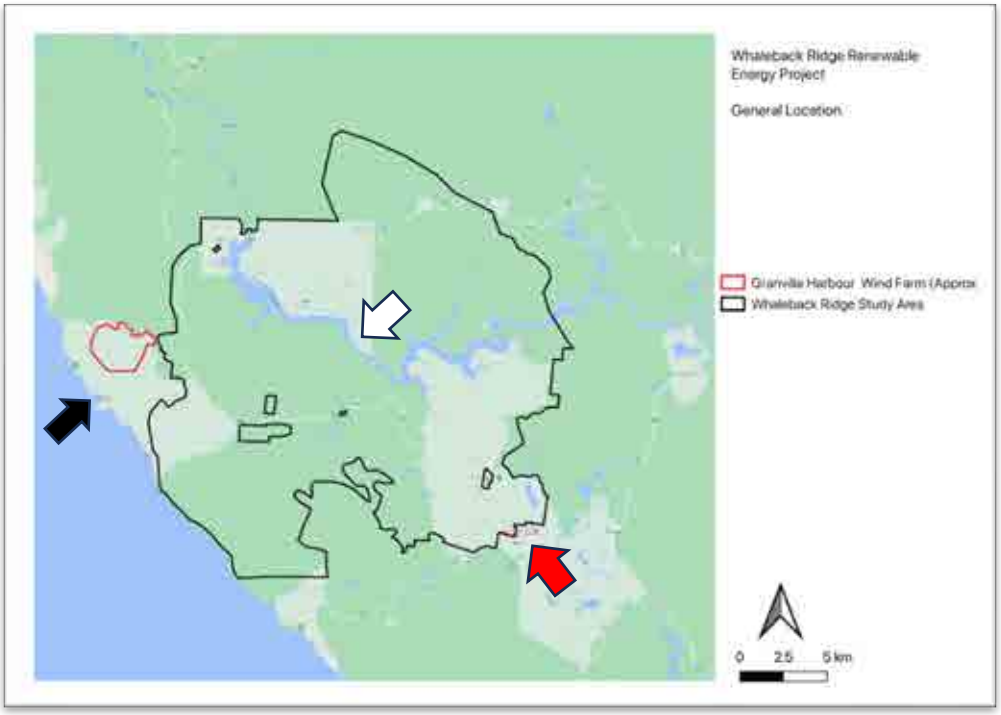


Figure 1. Whaleback Ridge project area between Granville Harbour (black arrow) and Zeehan (red arrow) and across the Pieman River (white arrow).

Death and maiming of large raptors through interaction with wind farm infrastructure (mainly collision with horizontal axis turbine blades) is a common problem at wind farms (e.g., Thaxter et al 2017). The obvious Tasmanian examples are the endemic wedge-tailed eagle *Aquila audax fleayii* (listed as endangered under both State and Federal legislation) and to a lesser extent, the white-bellied sea-eagle *Haliaeetus leucogaster* (listed as vulnerable under State legislation). To mid 2023, 56 eagles the vast majority being the former species, have been reported as being found dead/maimed at 4 of the 5 operational Tasmanian wind farms (Pullen in press). The notable exception is the Granville Harbour Wind Farm where no deaths (indeed no collisions) of wedge-tailed eagle or white-bellied seas-eagle have been recorded despite implementation of a daily carcass search (more frequent than operational

obligations) under all turbines since the commencement of turbine operations in 2020 (Granville Harbour Wind Farm, Annual Environmental Review 2022).

It is well established that risks to eagles from windfarms are highest on their migratory fly-ways and in good eagle habitat (e.g., Heuck et al 2019). In Tasmania only the latter situation is relevant. Tasmanian eagles are not migratory and individually tagged eagles can be found in Tasmania all year around (Pers obs and Pay pers comm for wedge-tailed eagles and pers obs and Wiersma pers comm for white-bellied sea-eagles). Good eagle habitat equates with higher densities of eagles, given there is no extreme suppressing influence in good habitat. The most logical primary mitigation measure available in regard to minimising risks to eagles from large horizontal axis turbines, is therefore to undertake early planning and select areas that have relatively few eagles. That is what applied with the operational Granville Harbour Wind Farm (Pitt and Sherry 2013) and Heemskirk Wind Farm (Hydro Tasmania 2003, (this development not proceeding to construction) where pre-construction surveys showed no eagle nests and exceptionally low activity of eagle on and about the sites.

Tasmania's Natural Values Atlas (NVA) observation records of wedge-tailed eagles (the usual species of concern because turbine caused eagle mortality records are overwhelmingly of this species) superficially suggest that most of western Tasmania (except for the far north-west) has relatively low numbers (Fig 2).

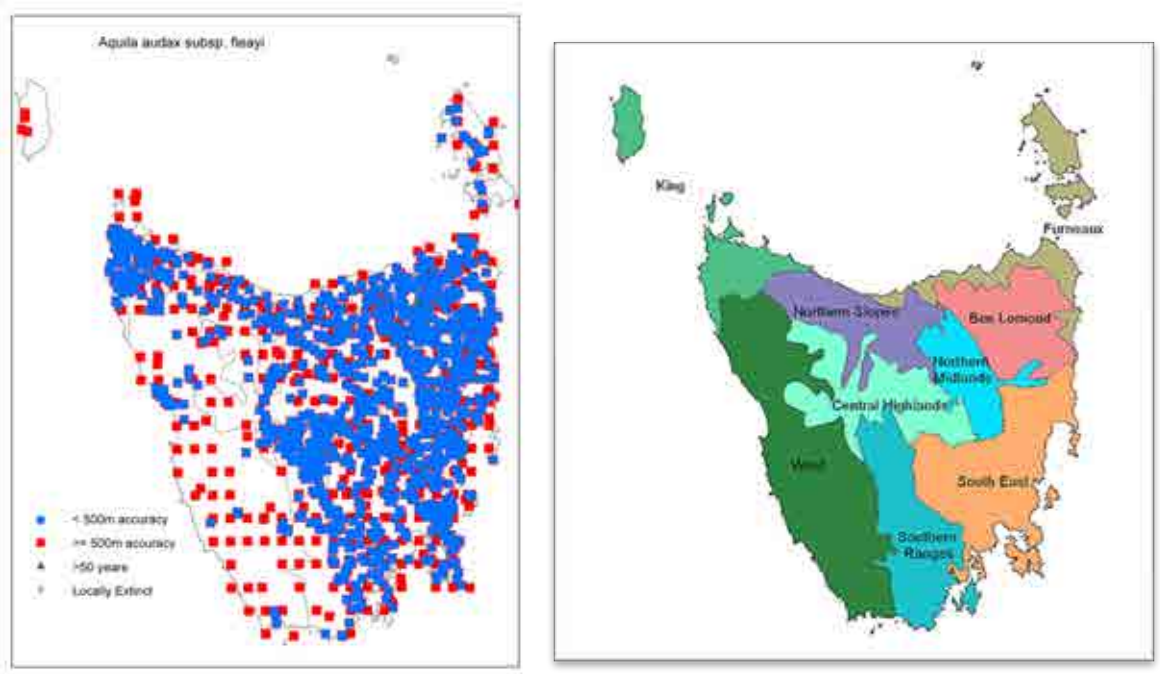


Figure 2. Records of wedge-tailed eagle distribution across Tasmania (left) and Tasmania's 9 IBRAs.

This superficially very varied spatial density of wedge-tailed eagles is also reflected by comparing eagle nest records for each of Tasmania's bioregions (*Interim Biogeographic Regionalisation of Australia,* IBRAs, Fig 2). Nests of both species are pooled here because use of many particular nests can be by either species so I regard most as potential wedge-tailed eagle nests. Eagle nest records in the West IBRA show a nest density of 500.4km^2/nest. The other Tasmanian IBRA's, particularly in the east of the State show much higher densities by a factor of at least 6.4 and up to 31 times more than the West IBRA (Table 1.). Although wedge-tailed eagles are rarely sighted and do not nest on King Island, the KING IBRA's eagle nest density is comparable with or without that island.

Table 1. Relative Density of potential wedge-tailed eagle nests between Tasmania's IBRAs (data from the NVA to mid 2023).

IBRA	Area (km^2)	Nests	Nest Density (km^2/nest)	Relative Density
WEST	15,511	31	500.4	1
CENTRAL HIGHLANDS	11,825	151	78.3	6.4
FERNEAUX	4,951	74	66.9	7.5
NORTHERN MIDLANDS	4,131	104	39.7	12.6
NORTHERN SLOPES	6,226	188	33.1	15.1
KING (with King Island) KING (without King Is)	5291 4193	159 140	33.3 30	15 16.7
SOUTHERN RANGES	8,266	281	29.4	17
SOUTH EAST	11,284	453	25	20
BEN LOMOND	6,485	401	16.2	31

The distribution of eagle sighting and nest records on the NVA are likely subject to considerable bias in search effort across the landscape. Recent (2021-2023) systematic survey of Tasmania sought to better describe the apparent relative spatial density by applying standard search effort across the landscape. This was done by carrying out three repeats of 300km road transect counts of eagles in each of Tasmania's nine IBRAs, the surveys recording distance-to-transect data for Tasmanian raptors, eagles included. Preliminary analysis of results supports the generalisation of radical differences in spatial density again with exceptionally low numbers of wedge-tailed eagles in the west below the far north-west (Table 2.).

Table 2. Counts of wedge-tailed eagles (WTE) and white-bellied sea-eagles (WBS) in the four of Tasmanian's nine IBRAS currently with operational windfarms as mean (SD) of three repeats of the same 300km transect.

IBRA	Numbers of eagles counted as mean (SD).
WEST	WTE 1 (1) WBS 0
FERNEAUX	WTE 8.7 (3.06) WBS 1 (1.7)
CENTRAL HIGHLANDS	WTE 9 (4.4) WBS 0
KING (no King Is)	WTE 7.3 (3.8) WBS 2.3 (0.6)

To inform the risk of impacts of the proposed Whaleback Ridge Renewable Energy Project on eagles, baseline searches for nests of wedge-tailed eagle and white-bellied sea-eagle were undertaken across and immediately adjacent to the project area in May and June 2022. The nest searching was voluntarily undertaken to improve understanding of wedge-tailed eagle and white-bellied sea-eagle nesting within and immediately surrounding the project area so that early site selection and design for the project could be informed to avoid nests and most potential nesting habitat (ie. this early searching was not required by the regulator). This report contains a record of the searches undertaken including the details of the search methodology used.

METHODS

Project Area

The 40,000 hectare project area for Whaleback Ridge is dominated by large plateaus and ridges of button grass (*Dactyloctenium radulans*) that are sparse and extremely exposed to harsh conditions including frequent burning (e.g. Fig 4). Many of these ridges are transected by mineral exploration tracks. Due to the poor soil quality (mostly quartzite with little to no topsoil), frequent burning and the exposed nature of the vast majority of the project area it is unlikely to support high levels of food sources and large tree growth for nesting eagles. There are a number of deep drainage lines between the plateaus with some steep valleys containing wet and dry forest woodland and scrub. Some of this contains suitable nest trees, the larger, more sheltered gullies having copses of such.

Figure 4. Photographs from helicopter of the Whaleback Ridge project area buttongrass (the tracks are from mineral exploration)

Eagle Nesting Requirements

The usual nesting habitat for Tasmanian wedge-tailed eagles is old-growth eucalypt or mixed forest of more than 10ha (Mooney and Holdsworth 1991, Threatened Species Section 2006). Nest trees are usually amongst the largest and most stable in a locality. They are generally in sheltered positions on leeward slopes, between the lower and mid sections of a slope and with the top of the tree usually lower than the ground level of the top of the ridge. In some parts of the State with little relief shelter is obtained by nesting within the canopy. Occasionally nesting is in exposed situations but this is usually a function of less nesting options in a food-rich landscape (Newton 1979) and appears to be happening more often in recent years (Natural Values Atlas (NVA) records, pers obs) a process perhaps assisted by lowered levels of persecution (Tasmanian raptor rehabilitation records, Mooney unpub data) and consequent diminished fear of people.

In Tasmania, white-bellied sea-eagle nests usually occur on islands or in forest within 5km of the coast, on inland lakes or large rivers or areas with a landscape mosaic including wetlands and farm dams (Threatened Species Section, 2006). While this species will choose mature trees when available this is not always a crucial requirement for nesting and the species will also nest on sea cliffs and rock stacks on islands. Nest trees can be on exposed slopes and close to forest boundaries, particularly near permanent water or well sheltered in forests. Often it is difficult even for very experienced observers to reliably allocate an unoccupied nest to an eagle species.

There is sometimes direct competition for nests between these eagle species and some interchange of nests occurs. Consequently all eagle nests are managed the same in the context of wind farms and

most other development (Threatened Species Section, 2006). Wedge-tailed eagles taking over nests built by white-bellied sea-eagles can explain (but not all) some of the former's nesting in very atypical situations. Regardless, it is nesting by wedge-tailed eagles.

Desktop Review of Nest Records and Potential Nesting Habitat

Using information from the NVA, a desktop review was conducted of the existing raptor nest records and potential nesting habitat across the project area and its immediate vicinity, the latter using the wedge-tailed eagle nesting habitat model integrated into the NVA.

Field Survey of the Project Site

A B3 Eurocopter squirrel helicopter (of Helicopter Resources) was used to search areas of potential nesting habitat in and within 3km of the project area and up to 5km for previous nest records. Principal observer was Nick Mooney (environmental consultant and raptor specialist), a very experienced eagle nest searcher both from ground and helicopters. Secondary observer was Chantel Hodgson (environmental consultant, experienced searching for eagle nests) and the pilot was Hoey Stobart, also extremely experienced in eagle searches (who has himself found many nests).

The survey was conducted in accordance with regulator standards (Forest Practices Authority 2015). Windows of ideal weather (wind > 20kph, unlimited visibility) were chosen for searching. Searching was in 2-3 hour blocks because of refuelling and this limited fatigue and potential loss of efficacy and search flying was at about 25kts ground speed at about twice canopy height, speed and height varying to do with habitat complexity to maintain a search intensity.

Most eagle nest searches in Tasmania have been 'strategic' in that they only search the habitat predicted by the potential nesting habitat model as having high and medium potential for eagle nesting. However, the principal observer's recent experience elsewhere in Tasmania using systematic searches has found 25% or more of nests were in habitat modelled as low potential or indeed not identified as having any potential nesting habitat. This experience, combined with the project proponent's pro-active approach in regard to wanting to understand eagle nesting locations as early as possible in project design led to the choice of systematic searching using parallel transects separated by 200-300m (depending on habitat complexity) of all habitat structures recorded as being used for nesting eagles in Tasmania. Flight was slowed for trees of interest and forested gullies were targeted for multiple passes using slower searching. Complex forest sections that had particularly high potential for nesting (not all were modelled as such) were overflown very slowly and methodically. Areas with no nesting potential (e.g. button grass plains) were overflown along more spaced transects at higher speed.

Any raptor seen in or adjacent to the project area was recorded as species, likely sex/age (where possible), behaviour and position.

The helicopter used an inflight tracking system which recorded the flight paths (Fig 6) with hand help Garmin GPS systems for backup navigating and site recording. Equipment used by searchers also included standard binoculars, range-finding binoculars, cameras, and tablet live-tracking against the desktop geographic information.

RESULTS

Desktop Review of Nest Records and Potential Nesting Habitat

The desktop searches returned results for three previous records of wedge-tailed eagle nests and one white-bellied sea-eagle nest within 5km of the study area (Fig 5). The NVA date of finding records of the nests ranged from 1985 to 2009 with no recent observational updates.

The nest habitat model showed the likelihood of wedge-tailed eagle nesting habitat was very low across most of the site (nearly 97% of the site) with the exception of some of the forested gullies within the project area and some of the forested areas within 3-5km of the project area (Fig 5).

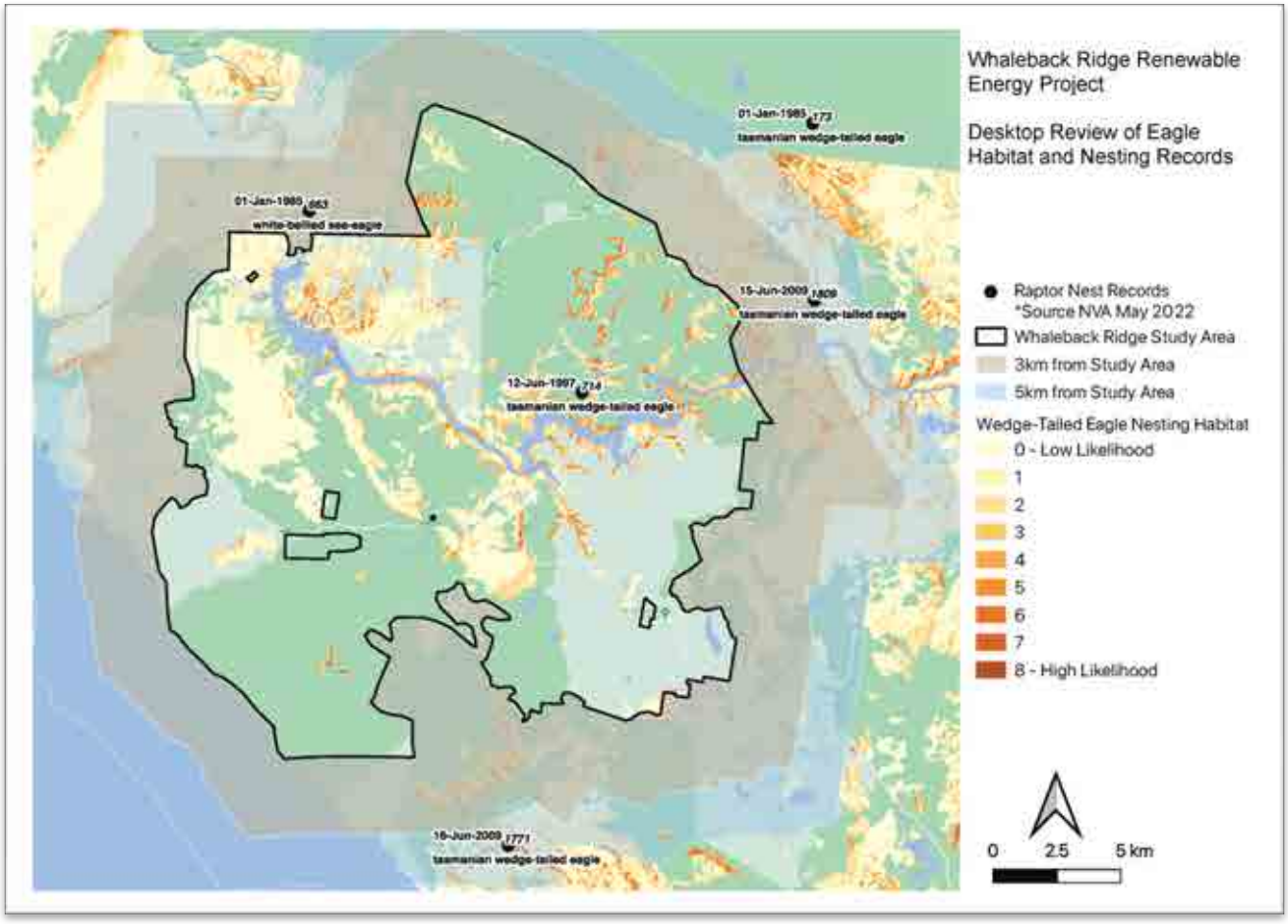


Figure 5. Desktop Review of Nest Records and Habitat Model NVA

Field Survey of the Project Site

Searches were undertaken over most of three days in May and another two days in June 2022 totalling five days of searching ahead (clear) of the 'eagle constraint period' and 2022 breeding season. Searching included areas within 3km of the project area and also checking of any locations of existing nest records within 5km of the project area (Fig 6.).

Three previously recorded nests in the project area (NVA numbered Nest 663, Nest 714 and Nest 1809) were unable to be re-located by helicopter searching despite the principal observer having seen two in previous decades. Given these nest records were 10 -34 years old and some of the areas (including one nest location) have been subject to intense bushfire it is probable these nests are no longer present. At one site a large broken tree was found suggestive of a fallen nest. No eagles were

seen close to any of those locations. Nest 1771, located 5km to the south of the project area and nominated as of wedge-tailed eagle, was re-located (Table 2.). The nest was in a classic wedge-tailed eagle nesting site, appeared viable but from epiphytes growing in the nest was likely unused for breeding in recent years.

No new eagle nests were identified in or within 3km of the project area.

One new nest was located very near the coast 3.2km from the project area during a boundary search of a likely area. The nest was typical of white-bellied sea-eagle and was being maintained (nest in excellent condition and containing fresh seaweed). Adult white-bellied sea-eagles were regularly seen in the nest's general vicinity by local people (Simpson pers comm).

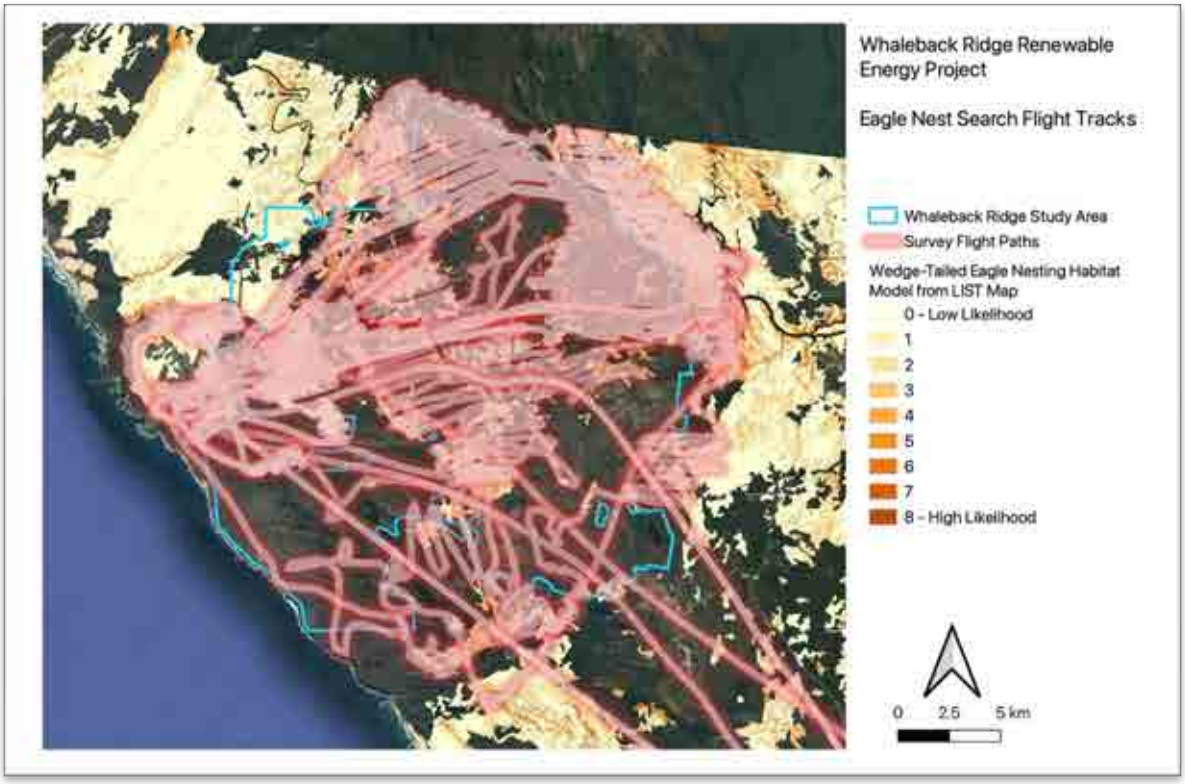


Figure 6. Helicopter Survey Flight Path.

The survey resulted in 14 incidental observations of raptors (grey goshawk *Accipiter novaehollandiae*, wedge-tailed eagle and white- bellied sea-eagle) across the area. The low number of incidental observations of eagles (indeed of any raptors) over the 5 day search period is consistent with low abundance of eagles across the project area.

DISCUSSION AND CONCLUSION

The failure to find new nests within the large project area or its immediate vicinity was superficially profound. However, the vast majority of the area had very poor potential for wedge-tailed eagle nesting. In the experience of the principal observer, very experienced with both strategic and systematic surveys sampling most of Tasmania, such effort over similar sized areas (including small, scattered areas of high potential nesting habitat) of eastern, southern, central and far north-west

Tasmania would have found 15-20 nests. In addition, encounters with eagles either perched or flying would have been higher by a factor of about 10.

The principal observer has previously helicopter searched many areas of 500-2,000ha on the west coast for development assessment (mainly for mines), as have other consultants and the forestry industry with very few searches finding nests. Those searches that do not find nests have no record on the NVA (only records of nests found or checked are submitted). This means there has been much more searching there than apparent. Moreover, nests in the west are likely little disturbed compared with those elsewhere and therefore pairs of eagles likely have less nests per territory (e.g., Mooney and Holdsworth 1991). Therefore, the relatively few nest records on the NVA from the west coast probably reflects reality.

It is important that the regulator develop a record system that allows search tracks and results to be pooled including search efforts that do not find nests.

The systematic searching reported here combined with more intensive examination of particular sites (in effect overlaying strategic survey on systematic survey) was by experienced searchers in good conditions using near ideal navigation and aircraft.

It is understood that even thorough helicopter searching can miss recognisable nests (ie. that are more than minimalist remnants or beginnings). From occasional records of nests found opportunistically soon after thorough searches, the author estimates 5-10% can be missed even when very experienced searchers are used. This means that a few nests may exist in the project area but additional nest search efforts will be made during project development perhaps even including GPS tagging of adult eagles.

A few adult eagles of both species were seen in the project area. Combined with the apparent loss of several pre-recorded nests (which may have been replaced) those observations may indicate some nests were missed. All previously known nests in the area are in sites typical of wedge-tailed eagle or white-bellied sea-eagle breeding habitat. Typical potential nesting sites for wedge-tailed eagles do appear in the project area (especially in its west just south of the Granville Harbour Wind Farm). The dearth of nests would therefore appear to be real. Nests come and go of course and in the more than 1 year since searching a nest(s) could be built, why such searches have a 2 year life span.

The most obvious, effective mitigation measure available to renewable energy developers is to undertake early planning and site selection of areas that are likely to minimise impacts on eagles. This can be done at several scales. On a large scale, the site for the proposed Ridge Renewable Energy Project would appear to satisfy this ambition. On a small, local scale a turbine development exclusion zones have been developed by project management and will continue to be refined. The author understands that the turbine exclusion zones currently established for the project include exclusion of all forested areas which covers the overwhelming majority of areas that have potential eagle nesting habitat.

At Tasmanian wind farms development of wind turbines and ancillary infrastructure has been required to have at least a 1km buffer to eagle nests, invariably applied as a circle around a nest. However, continued eagle deaths at most Tasmanian wind farms and extensive research elsewhere (eg Murgatroyd et al 2021) suggests this universally applied buffer may be far too small and/or an inappropriate shape - it is after all arbitrary in both size and shape having no data basis for physically protecting eagles. Further site-specific understanding of eagle flight activity such as provided by GPS tracking of eagles to accurately record eagle flights near nests can allow tailoring in size and shape of buffers which cover key flights lines for particular nests. Such study has resulted in detailed understanding of the flight behaviour of at least immature wedge-tailed eagles in much of Tasmania

(Pay et al 2022) and such sophisticated data should be used in deciding on turbine placement and buffer design.

It should not be surprising that the 1km buffer is likely not 'fit for purpose' in Tasmania since it was a distance developed for minimising disturbance to nesting eagles in forestry operations, not reducing risk of mortalities from collision with wind turbines (the author was the principal in the development). Accordingly, project managers indicate site specific turbine exclusion zones of potentially more than 1km around nests will be included during the design and approval process for the proposed wind farm at Whaleback Ridge, should at-risk nests be identified. A large project site facilitates this flexibility.

Effective engineering mitigations have been developed such as a single black blade (eg May et al 2020) and curtailment of turbine rotation on the approach of eagles (eg McLure et al 2021). Other logical mitigation measures have also been used including regular carrion removal from near turbines to prevent eagles being attracted to scavenging there. For example, Granville Harbour Wind Farm undertakes daily checks and removal of any carcass (e.g. road-killed wallaby) from the wind farm. Despite these effective mitigation options Whaleback Ridge Renewable Energy Project planners advocate that the first line of 'defence' should be good geographic planning and turbine placement away from areas likely to have nesting eagles or that have high levels of eagle activity, especially if that represents high eagle densities.

ACKNOWLEDGMENTS

West Coast Renewables suggested this survey be published and asked me to write it up and I thank them for the opportunity. Chantel Hodgson was very helpful with providing maps and David Storey of DNRET was very helpful with provision of NVA data.

REFERENCES

Forest Practices Authority (2015). Eagle nest searching, activity checking and nest management. Fauna Technical Note No. 1, Version 2.9 May 2015.

Granville Harbour Wind Farm (2022). Annual Environmental Review 1 July 2021 – 30 June 2022. Report, 2022.

Heuck, C., Herrmann, C., Levers, C., Leitão, P., Krone, O., Brandl, R. and J. Albrecht (2019). Wind turbines in high quality habitat cause disproportionate increases in collision mortality of the white-tailed eagle. Biological Conservation, 236 pp 44-51

Hydro Tasmania (2003). Heemskirk Wind Farm Development Proposal and Environmental Management Plan. Private report, January 2003.

McClure, C. J. W., Rolek, B., Dun, L., McCabe, J., Martinson, L. and T. Katzner (2021). Eagle fatalities are reduced by automated curtailment of wind turbines. Appl Ecol. 2021;00:1–7.

Murgatroyd, M., Bouten, W. and A. Amar (2021). A predictive model for improving placement of wind turbines to minimise collision risk potential for a large soaring raptor. J. Appl Ecol. 2021;58:857-868.http://doi.org/0.1111/1365-2664.13799

Mooney, N. and M. Holdsworth (1991). The effects of disturbance on nesting Wedge-tailed Eagles in Tasmania. *Tasforests* 3 pp25-33.

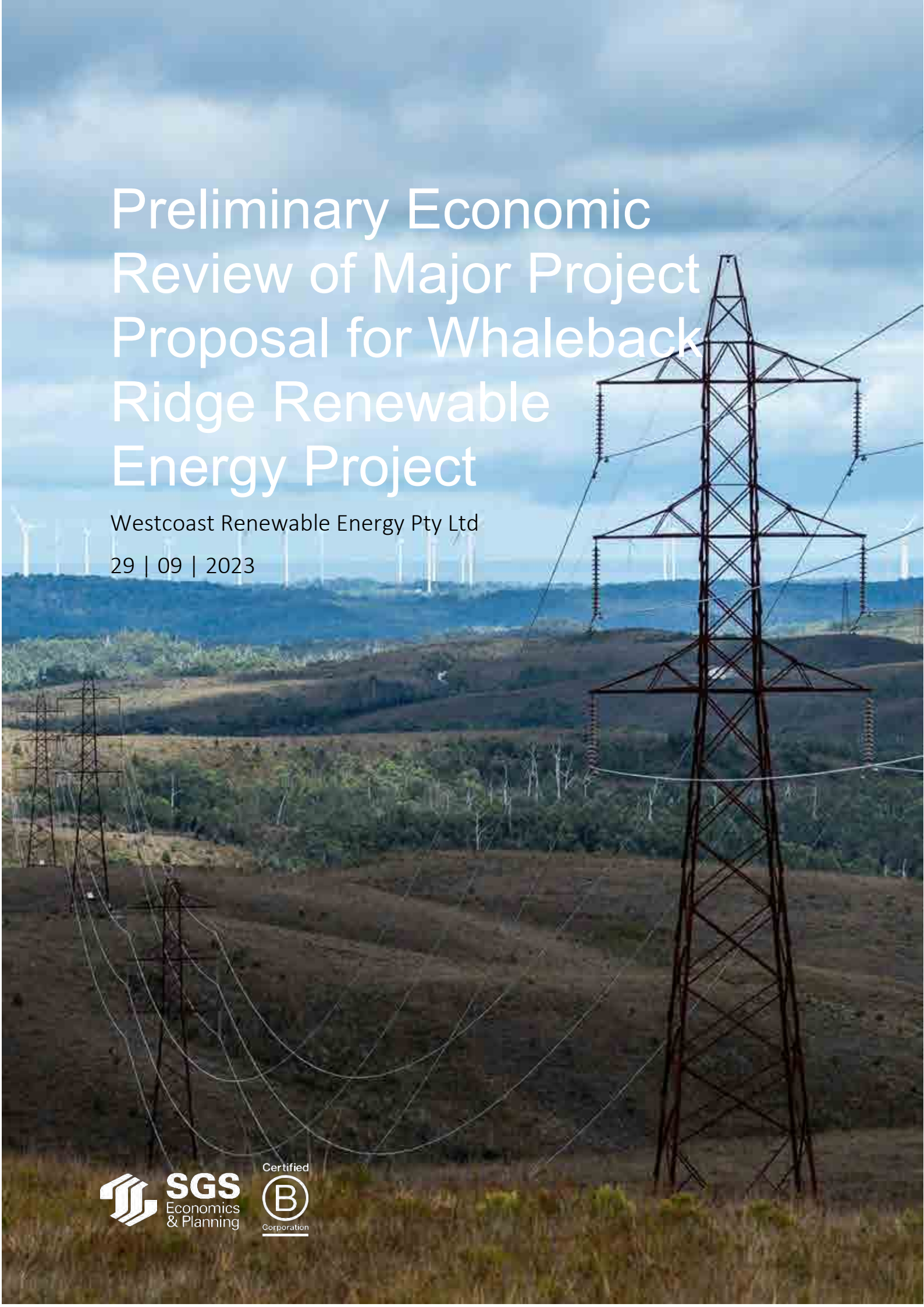
Newton, I. (1979). Population ecology of Raptors. Poyster, London.
Pitt and Sherry (2013). Granville Harbour Wind Farm Development Proposal and Environmental Management Plan. Private report, December 2013.

Pay, J., Patterson, T. A., KirsProft, K. M., Cameron, E. Z. , Hawkins, C. E., Koch, A. J., Wiersma, J. M. and T. E, Katzner (2022). Considering behavioral state when predicting habitat use: Behavior-specific spatial models for the endangered Tasmanian wedge-tailed eagle. Biological Conservation Vol 274, October 2022, 109743.
Roel May, R., Nygård, T., Falkdalen, U., Åström, J., Hamre, Ø and B. G. Stokke (2020). Paint it black: Efficacy of increased wind turbine rotor blade visibility to reduce avian fatalities. Ecology and Evolution; 10: 8927-8935.

Thaxter, C., Buchanan, G., Carr, J., Butchart J., Newbold, T., Green, R., Tobias, J., Foden, W., O'Brien, S. and Pearce-Higgins, J. (2017). Bird and bat species' global vulnerability to collision mortality at wind farms revealed through a trait-based assessment. Proc. Royal Soc. B. 284: 20170829. http://dx.doi.org/10.1098/rspb.2017.0829

Threatened Species Section (2006). Threatened Tasmanian Eagles Recovery Plan 2006-2010. Department of Primary Industries and Water, Hobart.

Appendix E SGS Economics and Planning Report



Preliminary Economic Review of Major Project Proposal for Whaleback Ridge Renewable Energy Project

Westcoast Renewable Energy Pty Ltd

29 | 09 | 2023

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1. Introduction

This document provides a high-level overview of the Tasmanian North West economy and the relative importance of Stage 1 of the proposed wind farm and supporting infrastructure of Whaleback Ridge Renewable Energy Project. It shows the potential of the investment to significantly lift economic activity on the West Coast and to shift and expand the economic flow-on opportunities for the North West in general. It demonstrates the significance of the project from an economic perspective and confirms the need to subject it to the Major Project assessment process.

2. The Current State of the North-West Economy

2.1 Summary of North-West Economy

The economy of the North-West Tasmania region had an estimated Gross Regional Product (GRP) of $6.8 billion in 2020, which is 20% of Tasmania's GRP. The region's economy is driven by primary production, mining and population-serving industries such as health care. The specialised manufacturing and engineering sector in Burnie provides high-value, knowledge-intensive jobs and an important cluster that can drive innovation, manufacturing and assembly supporting the roll-out of renewable energy projects in the region.

Tasmania is on the eve of significant change as widespread renewable energy investment is attracted to deliver on the Battery of the Nation, Marinus Link and Tasmania's Renewable Hydrogen Action Plan. Renewable energy generation is growing and will continue to be a growing sector due to government strategies such as the Tasmanian Renewable Energy Target and related projects such as Marinus Link. The renewables sector is a major economic opportunity through energy generation, exportation (at a state and national level) and value adding, bringing significant production gains and jobs.

2.2 Key Industries: high dependency on primary industries

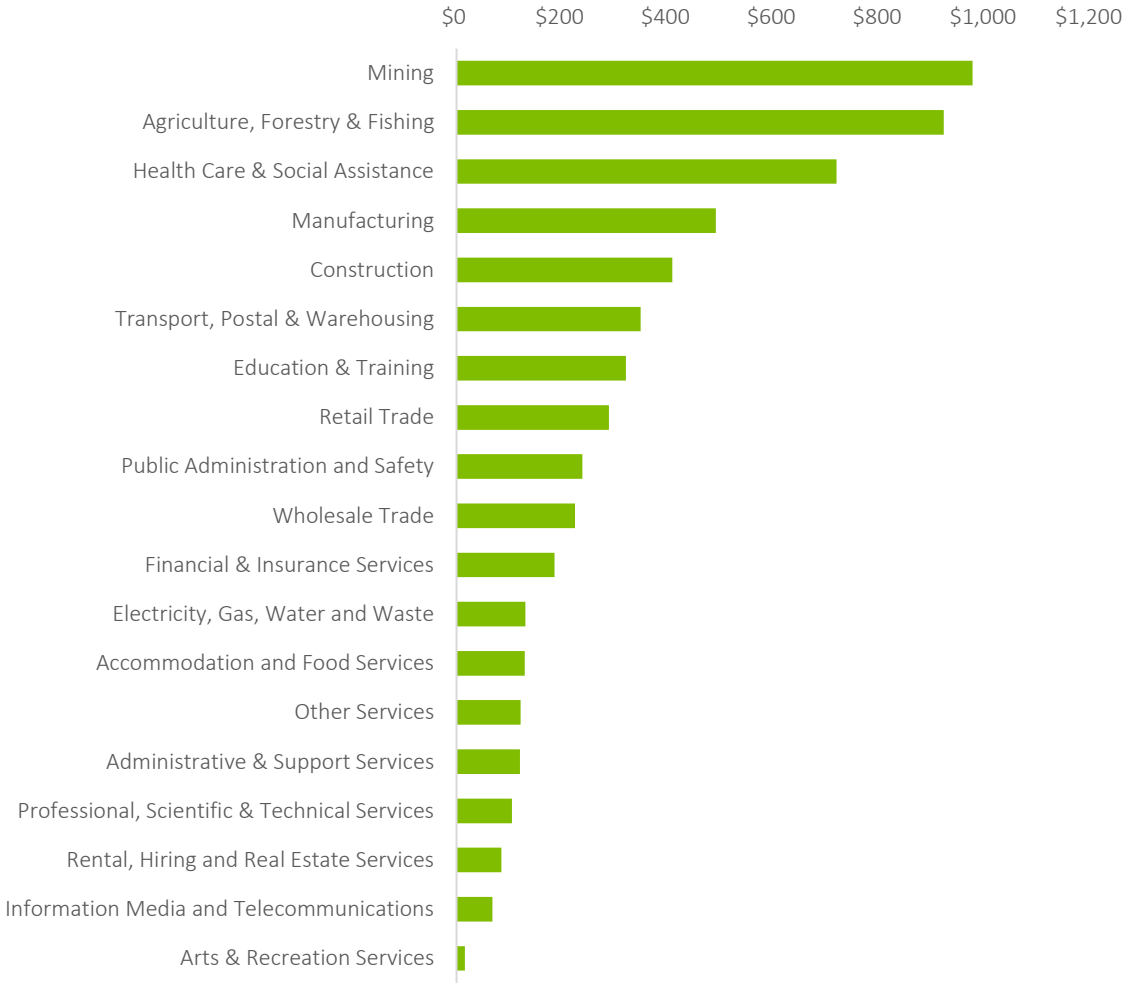
In the North West, three sectors collectively account for 44% of total income generated (as shown in Figure 1), being:

- mining,
- agriculture, forestry and fishing, and
- health care and social assistance.

Health care and agriculture, forestry and fishing have been growing. Mining and manufacturing have grown only slightly in terms of economic value. While there are no GRP data on the breakdown of the mining sector, the breakdown of employment data suggest that approximately 74% of mining activities involve metal ore mining and about 10% involves support services and exploration.

The economic contribution of electricity, gas, water and waste services has slowly been declining in the region. While manufacturing has not been a significant contributor to economic growth in recent years, it remains a regional strategic sector.

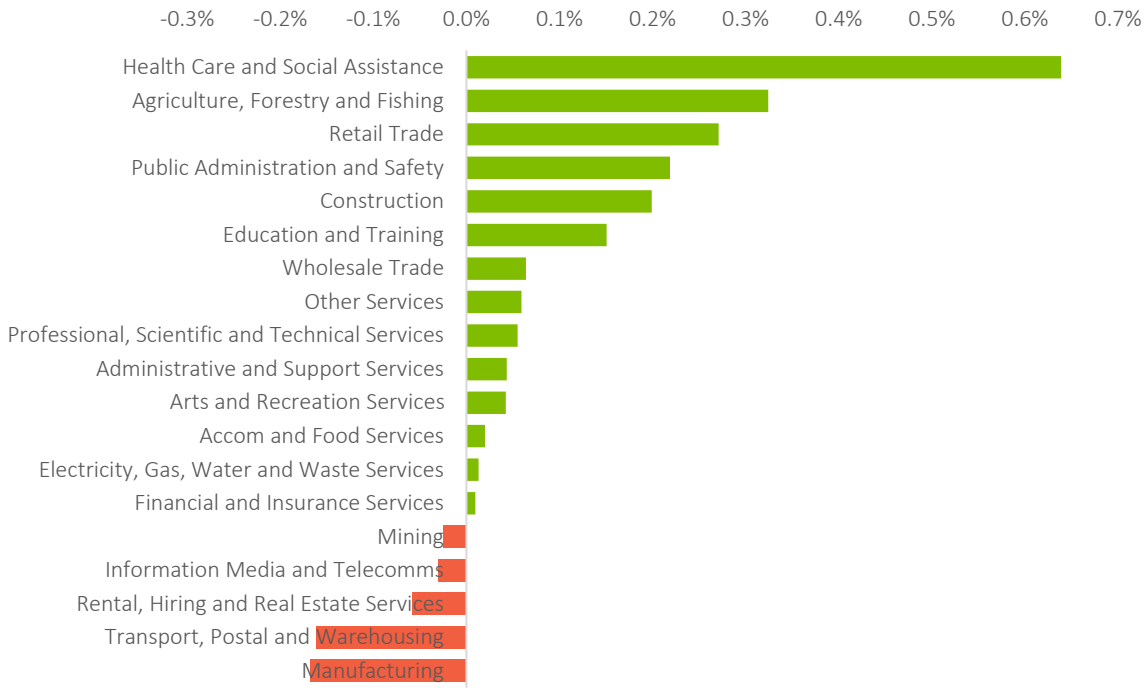
FIGURE 1: INDUSTRY CONTRIBUTION TO GRP 2019/20 ($MILLIONS)



Source: Australian National Accounts: State Accounts, Cat. No. 5220.0 and SGS Economics Planning

Employment in the mining sector is expected to decline over time, as shown in Figure 2. Mining's typical boom and bust cycle brings along employment volatility. Figure 2 also foreshadows a decline of employment in the manufacturing industry. The presented data do not include the significant renewable energy projects and the roll-out of Marinus Link. Importantly, a project the size of Whaleback Ridge Renewable Energy Project (Whaleback) has the ability to drive innovation within Tasmania including manufacturing and assembly of turbines and other infrastructure, thereby potentially lifting manufacturing out of its projected slump (See section 2).

FIGURE 2: PROJECTED CONTRIBUTIONS TO THE RATE OF TOTAL EMPLOYMENT GROWTH BY EACH INDUSTRY (PERCENTAGE POINTS) IN NORTH-WEST AND WEST TASMANIA – FIVE YEARS TO MAY 2024

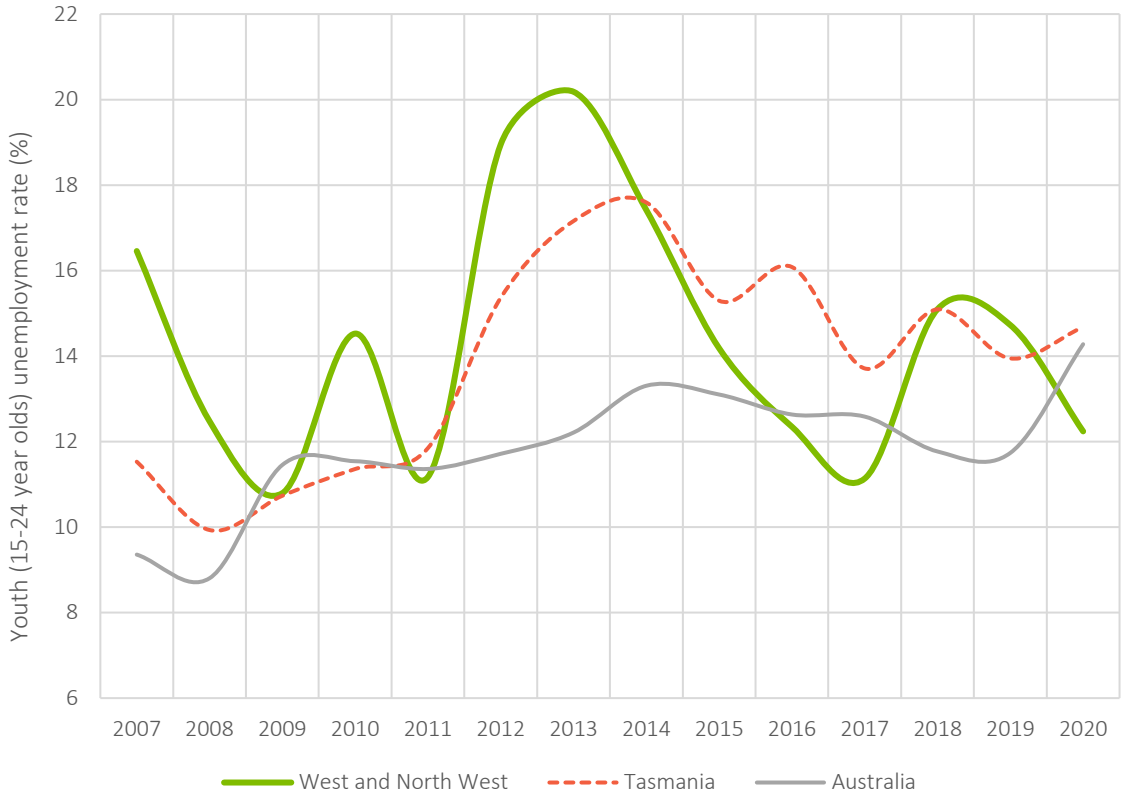


Source: Australian Government, Department of Employment, Skills, Small and Family Business (2019)

2.3 Labour and income

The North-West economy is characterised by lower than average incomes, low labour participation and high unemployment. The North West's unemployment rate is 7.4%, labour force participation is 58% and the median income of $44,910 (2018), is lower than the Tasmanian median income level of $46,080. In addition, youth unemployment is high at 14.1% as shown in Figure 3. Major projects like Whaleback can improve the opportunities for young people and other workers substantially.

FIGURE 3: YOUTH UNEMPLOYMENT RATE 2007 TO 2020

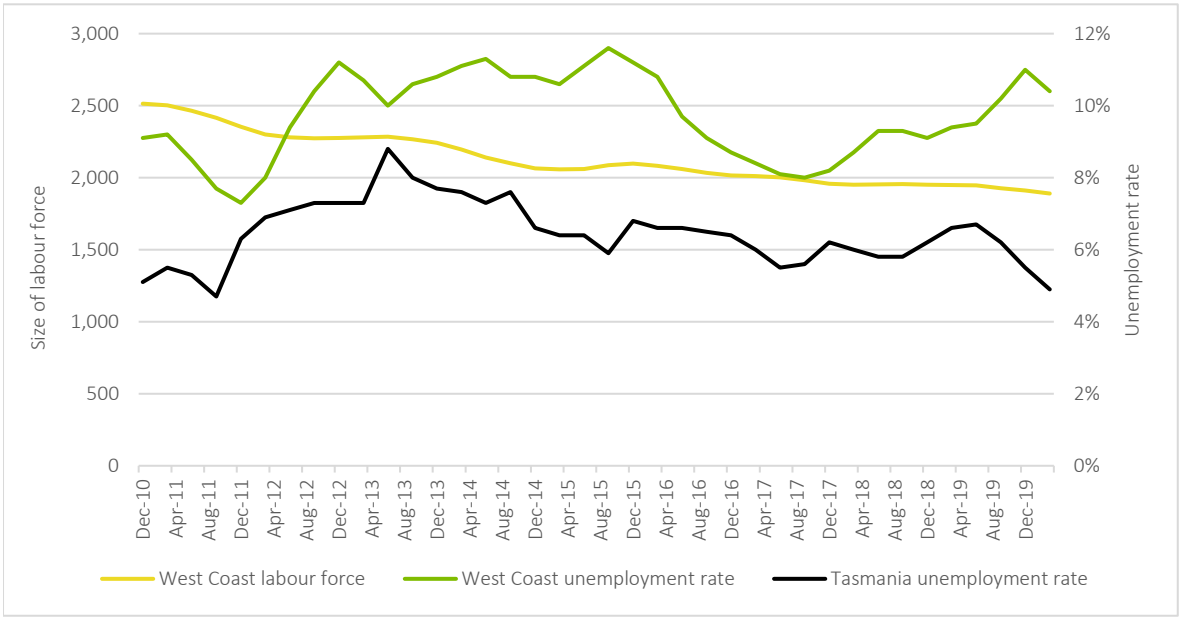


Source: SGS Economics and Planning (2021) using ABS Labour Force Survey (2021)

Info Box: West Coast Council Economy

The population of the West Coast Local Government Area is 4,167 (2021). This is projected to decline to just 2,960 by 2042. Due to the narrow economic base, the West Coast community experiences rolling shocks to employment, and unemployment has ranged from 7% to nearly 12% over just several years (ABS, 2013-2019).

FIGURE 4: LABOUR FORCE AND UNEMPLOYMENT RATE



Source: ABS Data, 2013-20, SGS Economics and Planning, 2020

While some economic diversification has taken place, most notably in relation to aquaculture and tourism, Tasmania's West Coast retains a relatively narrow economic base. This is a real risk to future economic prosperity. Gross regional output remains dominated by mining. With the output of mining falling over recent years, growing a diversified economy on the West Coast is more important than ever (ABS, 2013-19).

3. Whaleback's Contribution to the Economy

3.1 Economic contribution: a Major Project

Whaleback will bring significant investment into the North-West region during the development and operational phase of the project. The entirity of the project is envisaged to consist of the development of up to 500 turbines, generating 3GW in energy, and flow-on green industrial opportunity such as green hydrogen manufacturing and distribution capabilities. The total expenditure of the construction phase may be in the vicinity of $5 bn for the windfarm. Although outside of the scope of the Major Project Proposal, the potential downstream developments for energy users such as hydrogen or e-fuel production facilities may be in the vicinity of $3 bn. The level of investment is equivalent to 24 % of the North-West's GRP in 2020. Obviously, a project this scale has the ability to substantially lift and change the economic outlook of the region. The scale is well beyond the recently announced North East Wind Farm which was declared a Major Project on 12 August 2022.

Over the life of the project the estimated expenditure will be $20.2bn, at close to $673 million per annum (assuming an initial 30 years project life). The annual expenditure would equal 9% of the North-West's 2020 GRP. The operational expenditure per year will be comparable to the economic output of the North-West's healthcare and social assistance industry. In short, the level of investment is enormous.

Stage 1 would see the delivery of approximately 45 turbines with a renewable energy capacity of 288 MW. This represents a total investment of around $550 million. As benchmarked from other developments, the project will directly create approximately 170 FTE roles during the construction stage which is anticipated to take around 2 years. This represents 8% of total employment on the West Coast.

Ongoing jobs directly driven by the operations is around 16 FTE per annum. This represents close to 1% of total employment on the West Coast.

The timing and sizing of the subsequent stages of the project to reach the 3GW capacity will be determined based on a number of factors including availability of material and human resources. It is envisaged that subsequent stages will be larger than Stage 1. The assumption is that FTE workers on Stage 1 will continue their roles in subsequent stages. The increasing scale of the project will, however, bring additional logistical and construction complexity that means estimates of FTE required will also rise higher. Thus, it is estimated that FTE will more than double for subsequent stages. This will unfold over an anticipated 10 year period of construction.

Operational jobs for the full project may be estimated at 160 FTE over a 30 year life of the wind farm, This figure is indicative only as the detailed modelling follow-up stages has not been completed yet.

The direct impacts will generate additional flow-on effects to the wider economy (these have not yet been estimated). For example opportunities for associated green industries and advanced manufacturing would create further skilled jobs and economic benefits. The total economic impact of

this project is therefore more significant and will be studied in greater detail during the Major Project Impact Studies phase.

Overall, the project will bring significant employment opportunities to the wider region and will also bring challenges in terms of housing, training & education.

3.2 Costs and Benefits of Whaleback

A major project like Whaleback generates a wide range of social, economic and environmental opportunities and challenges. This section provides an overview of the types of costs and benefits it is likely to generate. An appropriate approvals process would require full consideration of these costs and benefits to the community.

When assessing costs and benefits, it is necessary to consider what would happen to a region if the project was not to go ahead (basecase scenario). In this regard both the West Coast and the entire North-West region are relevant to consider. Without Whaleback, the base case scenario will likely see a further decline of population and a continued reliance on a narrow economic base on the West Coast. The wider North-West region would see a continued development of other renewable energy projects, likely of a smaller scale. These smaller projects individually may not be able to act as a catalyst to bring manufacturing and assembly manufacturers to the island, with Tasmania foregoing opportunities for the declining manufacturing industry.

The project case, with Whaleback going ahead, would see substantial investment and ongoing employment in the West Coast and wider North-West region. The project is expected to generate some of the highest capacity factors and therefore some of the most affordable power in the country. The scale of the project would act as a catalyst and drive manufacturing and assembly activities into Tasmania, thereby growing its manufacturing industry.

In addition to this project case, there is a scenario (call it Whaleback plus) where Whaleback supports the development of a green hydrogen supply chain. This scenario would create significant opportunity for Tasmania to supply carbon free fuel for domestic and global export as the world transitions away from fossil fuel to renewable resources.

A major project like this will generate a range of costs and benefits to the community both during construction and the operational phase. Outlined in Table 1 are the high-level costs and benefits. The key costs will be related to the development, the subsequent operation of the energy facility, environmental impacts and social wellbeing impacts. The benefits include enhanced economic opportunities, a more rapid transition to a clean economy, economic opportunities from green hydrogen availability, reduced socio-economic disadvantage, enhanced community resilience and improved community health outcomes. In addition, the State Government would benefit from lease payments due to the operations occurring on Crown land.

TABLE 1: COSTS AND BENEFITS

Cost	Benefits
Capital costs - costs incurred to develop the renewable energy facility	Enhanced economic opportunities – increased value added and wages
Operating costs – these are the expenditures to operate the infrastructure, including leases	Rapid transition to a clean energy economy –reduced GHG emissions
Environmental costs – this refers to the impacts on environmental assets, including farmland and crown land, and natural values	Transition to green hydrogen and enhanced manufacturing capabilities in Tasmania
Social costs – these relate to social disruption especially during construction. This may include housing stress, loss of social cohesion.	Reduced socio-economic disadvantage - lower (youth) unemployment and enhanced labour force participation
	Enhanced community and economic resilience – especially at the operational phase, due to a more diversified economy
	Enhanced community health outcomes - Improved community infrastructure and services.
	Lease revenues to State Government for use of Crown land

Source: SGS Economics and Planning, 2022

4. Scope of future studies

Whaleback requires a fit for purpose approvals process and such a process needs support from a range of technical studies, which the proponent intends to commission. The project is of a major scale in economic terms, and is bigger than the Bridgewater Bridge as an investment. In addition, the investment would take place in the remote and small economy of the West Coast and is likely to signify major socio-economic change, not only for the local area but also the wider North-West region. At the regional and Statewide level, there is also the need to consider impacts on for instance housing, labour market and training needs. From an economic perspective, the project should be declared a Major Project to ensure a thorough approvals process.

4.1 Study Requirements as a Major Project

The requirements of a Major Project process will be determined on a case by case basis. It is however expected the requirements will give rise to the need to prepare:

- A Social and Economic Impact Assessment (SEIA) including some community consultation,
- Supply chain analysis and opportunities to optimise economic contribution to Tasmania, and/or
- A Cost Benefit Analysis (CBA).

The SEIA would include Computable General Equilibrium Modelling[1], a community survey and focus groups (the focus groups will likely be undertaken together with the planning consultant).

In addition, and to optimise local content and economic opportunities for Tasmania throughout the supply chain, particular analysis can be undertaken into specific labour skills and capabilities requirements.

[1] Due to the scale of the project, conventional Input Output modelling will not be sufficient. IO modelling does not account for the impact a project may have on the availability and price of local labour and materials.

Appendix – Policy Alignment

Whaleback is an enabler of the Tasmanian Renewable Energy Action Plan. It will provide energy generation to achieve 200 per cent by 2040 Tasmanian Renewable Energy Target. In addition, the project has strong alignment with other state and council strategies which include:

1. The Tasmanian Government's Draft Renewable Energy Coordination Framework
2. The Tasmanian Government's Energy Sector Workforce Development Plan
3. Infrastructure Tasmania's 30-year Infrastructure Strategy
4. The Tasmanian Government's Renewable Hydrogen Action Plan
5. The Tasmanian Chamber of Commerce and Industry, Tasmanian Small Business Council and Tasmania Government's Business Growth Strategy 2019-2023: Supporting Small Business Growth in Tasmania
6. The Tasmanian Department of State Growth's Northern Cities Major Development Initiative and Advanced Manufacturing Action Plan 2024
7. Cradle Coast Authority's Cradle Coast Authority Renewable Energy Working Group Action Plan and Cradle Coast Renewable Energy Working Group
8. The work of the Premier's Economic & Social Recovery Advisory Council
9. Tasmanian Government Buy Local Policy
10. RDA Tasmania's The Future for Renewable Energy: Opportunities for Tasmania

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Certified B Corporation

Appendix F Request for Crown Land Consent letter

Westcoast Renewable Energy Pty Ltd
ACN: 633 216 163
PO Box 10, ZEEHAN TAS 7469
Ref: Whaleback Ridge Renewable Energy Project

6 October 2023

Jason Jacobi
Secretary
Natural Resources and Environment
Parks and Wildlife Service
GPO Box 1751
Hobart TAS 7001

Email to: Jason.Jacobi@nre.tas.gov.au

Dear Jason

Request for Crown Land Consent for Major Project declaration pursuant to Section 60P(2)(a) of the *Land Use Planning and Approvals Act 1993*

Westcoast Renewable Energy Pty Ltd are proposing to develop the Whaleback Ridge Renewable Energy Project (the Project), a $5 billion renewable energy facility on the West Coast of Tasmania.

This is the next generation of renewable energy projects that are of sufficient scale to meet the future energy needs of Tasmania as well as contribute to decarbonisation of the economy. The Project can support meeting the Tasmanian Renewable Energy Target and provide critical opportunities to power the West and North-West regional economy to become leaders in renewable energy exports, decarbonising both local and global supply chains.

Planning and studies for the proposed Project have been ongoing for the last four years, with support from both Local and State Government. Additionally, the project is already recognised as a regionally significant project by the Cradle Coast Authority. The planning approvals process for the project is proposed to commence shortly, with Westcoast Renewable Energy Pty Ltd submitting the attached Major Project Proposal for consideration and declaration as a major project under the *Land Use Planning and Approvals Act 1993* by the Minister for Planning.

As part of the Planning Minister's consideration of the proposal against the legislated eligibility criteria, he will consult a range of interested parties including councils, state agencies, landowners and neighbours, before a decision is made whether to declare the project and subsequently refer it to the Tasmanian Planning Commission for assessment and determination.

Given the Project Land includes Crown Land within the meaning of the *Crown Lands Act 1976* including land managed by the Tasmanian Parks and Wildlife Services as shown in the attached proposal, WRE are providing a copy of relevant materials for your reference. This letter along with the attached Major Project Proposal constitute the request for Crown Land Consent for Major Project declaration under Section 60P(2)(a) of the *Land Use Planning and Approvals Act 1993.*

The Project Land primarily falls within land managed under the *National Parks and Reserve Management Act 2002*, and is classed as *Regional Reserve.* Consideration and initial assessment of consistency with Reserve Objectives has been included in the Major Project Proposal with an understanding that a Reserve Activity Assessment will also be necessary of the proposal.

WRE looks forward to the ongoing collaboration with the Tasmanian Parks and Wildlife Service through the Reserve Activity Assessment Process and the Major Project Assessment Process for this exciting project.

WRE look forward to further discussions and in the event of any further questions please do not hesitate to contact me at the details below.

Yours sincerely

Alan Morrell l Chief Executive
Westcoast Renewable Energy - PO Box 10, Zeehan TAS 7469 ACN: 633 216 163
m. +61 456 850 118 e. alan.morrell@westcoastrenew.com.au

Attached

Whaleback Ridge Renewable Energy Project Major Project Proposal (via link for download)

Westcoast Renewable Energy Pty Ltd
ACN: 633 216 163
PO Box 10, ZEEHAN TAS 7469
Ref: Whaleback Ridge Renewable Energy Project

6 October 2023

Ian Brooksbank
Chief Executive Officer
Hydro Tasmania
GPO Box 355
Hobart Tasmania 7001

Cc: Meegan Spurr, Ian Jones and Nick Sallmann
Email to: Ian.Jones@hydro.com.au, Nick.Sallmann@hydro.com.au, Meegan.Spurr@hydro.com.au

Dear Ian

Notification to Landowner of Major Project Proposal for declaration under the *Land Use Planning and Approvals Act 1993*

Further to our earlier briefings with Hydro Tasmania, Westcoast Renewable Energy Pty Ltd are proposing to develop the Whaleback Ridge Renewable Energy Project (the Project), a $5 billion renewable energy facility on the West Coast of Tasmania.

This is the next generation of renewable energy projects that are of sufficient scale to meet the future energy needs of Tasmania as well as contribute to decarbonisation of the economy. The Project can support meet the Tasmanian Renewable Energy Target and provide critical opportunities to power the West and North-West regional economy to become leaders in renewable energy exports, decarbonising both local and global supply chains.

Planning and studies for the proposed Project have been ongoing for the last four years, with support from both Local and State Government. Additionally, the project is already recognised as a regionally significant project by the Cradle Coast Authority. The planning approvals process for the project is proposed to commence shortly, with Westcoast Renewable Energy Pty Ltd submitting the attached Major Project Proposal for consideration and declaration as a major project under the *Land Use Planning and Approvals Act 1993* by the Minister for Planning.

As part of the Minister's consideration of the proposal against the legislated eligibility criteria, he will consult a range of interested parties including councils, state agencies, landowners and neighbours, before a decision is made whether to declare the project and

subsequently refer it to the Tasmanian Planning Commission for assessment and determination.

Given the Project Land includes land managed by Hydro Tasmania, WRE are providing a copy of relevant materials for your reference.

WRE looks forward to the ongoing collaboration with Hydro Tasmania through the Major Project Assessment Process for this exciting project.

If you have any further questions please do not hesitate to contact me on the below details.

Yours sincerely

Alan Morrell l Chief Executive
Westcoast Renewable Energy - PO Box 10, Zeehan TAS 7469 ACN: 633 216 163
m. +61 456 850 118 e. alan.morrell@westcoastrenew.com.au

Attached

Whaleback Ridge Renewable Energy Project Major Project Proposal (via link for download)

Westcoast Renewable Energy Pty Ltd
ACN: 633 216 163
PO Box 10, ZEEHAN TAS 7469
Ref: Whaleback Ridge Renewable Energy Project

6 October 2023

Steve Whiteley
Chief Executive Officer
Sustainable Timbers Tasmania
Level 1, 99 Bathurst Street
Hobart Tasmania 7000

Emailed to: Steve.Whiteley@sttas.com.au
Cc to: Suzette.Weeding@sttas.com.au

Dear Steve

Notification to Landowner of Major Project Proposal for declaration under *Land Use Planning and Approvals Act 1993*

Further to our earlier briefings with Sustainable Timbers Tasmania, Westcoast Renewable Energy Pty Ltd are proposing to develop the Whaleback Ridge Renewable Energy Project (the Project), a $5 billion renewable energy facility on the West Coast of Tasmania.

This is the next generation of renewable energy projects that are of sufficient scale to meet the future energy needs of Tasmania as well as contribute to decarbonisation of the economy. The Project can support meeting the Tasmanian Renewable Energy Target and provide critical opportunities to power the West and North-West regional economy to become leaders in renewable energy exports, decarbonising both local and global supply chains.

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As part of the Minister's consideration of the proposal against the legislated eligibility criteria, he will consult a range of interested parties including councils, state agencies, landowners and neighbours, before a decision is made whether to declare the project and

subsequently refer it to the Tasmanian Planning Commission for assessment and determination.

Given the Project Site includes land managed by Sustainable Timbers Tasmania, WRE are providing a copy of relevant materials that have been submitted as part of the Major Project Proposal for your reference.

WRE looks forward to the ongoing collaboration with Sustainable Timbers Tasmania through the Major Project Assessment Process for this exciting project.

If you have any further questions please do not hesitate to contact me on the below details.

Yours sincerely

Alan Morrell l Chief Executive
Westcoast Renewable Energy - PO Box 10, Zeehan TAS 7469 ACN: 633 216 163
m. +61 456 850 118 e. alan.morrell@westcoastrenew.com.au

Attached

Whaleback Ridge Renewable Energy Project Major Project Proposal (via link for download)