

Attachment A Preliminary Documentation Requirements Checklist

Key area	DCCEEW Specific Information required	DCCEEW Sub-point (s)	Proponent comments and where addressed	DCCEEW Adequacy
1. Description of the action The preliminary documentation must provide a detailed description of the proposed action, including: <ul style="list-style-type: none"> State the purpose of the action a summary of all components of the action. a description of the activities associated with the potential development throughout its entire lifecycle. Provide details of any interdependent developments or proposals outside of the project area. Plans or maps to delineate the position of all activities and components of the action (including retained vegetation).	a) an indicative layout plan for the proposed action area, including the location and type of land use, key infrastructure, revegetation and landscaping areas, open space and conservation areas (if applicable).		Figure 2-1 and Figure 2-4	Adequate
	b) the location, boundaries and size (in hectares) of the disturbance and any adjoining areas which may be indirectly impacted by the proposed action. The disturbance area should be clearly identified. Information should outline the proposed construction activities associated with each activity (pre-construction, construction, and operation).	i. The footprint and design of the construction right of way (CROW) where the hydrogen pipeline will be buried and vegetation cleared. ii. Clarify extent of vegetation and habitat types proposed to be cleared in hectares. This applies even if considered temporary.	i. Section 2.3, Figure 2-2 and Figure 2-3 ii. Table 2-1 and Table 2-2	Further information required
	c) a description of the construction and operational requirements of the action, including <u>but not limited to</u> :	i. relevant pre-construction activities.	i. Section 2.5; Section 2.6.1.1	Adequate.
		ii. construction activities of the action, detailing: <ul style="list-style-type: none"> Erosion and sediment controls for displaced soils and construction materials under rainfall and dry conditions. Any contaminated sites within the CROW alignment and the risk controls to prevent mobilisation of contaminants. Waste management activities Revegetation areas and activities Weed management plan through life of the action. Timeline for pipeline construction that ensures temporal avoidance and all other relevant controls throughout the life of the proposed action that prevent adverse water quality and significant impacts to adjacent MNES, including to potential migratory shorebird habitat, the Upper Spencer Wetlands (also known as the BHP Saltfields) and National Heritage Place, CCSZ. 	ii. Sections 2.6 and 2.7 (Construction): <ul style="list-style-type: none"> Section 2.6.2.1 (Erosion and Sediment Controls) Section 2.6.2.2 and Section 2.6.2.3 (Contaminated Soil and Water) Section 2.6.1.12 (Waste) Section 2.6.1.11 (Rehabilitation) and Section 4.3.2.2 (Revegetation and monitoring) Section 4.3.3.2 (Weed Management Plan) Section 2.4, Section 2.6 and Table 2-5 (Construction timeline) Controls to prevent adverse water quality and significant impacts to adjacent MNES: <ul style="list-style-type: none"> Section 2.6.2 (via erosion and sedimentation) Section 2.6.3 (at watercourse crossings) Section 4.3.3.4 (on surface water) Section 4.3.3.5 (on groundwater) Section 5.3.3 (on migratory bird habitat) Section 6.2.3 (on national heritage place CCSZ) 	Further information required
		iii. Maintenance works, including details of: <ul style="list-style-type: none"> ongoing maintenance activities of infrastructures that will be required, including predicted frequency. management of native vegetation areas, including revegetation and landscaping areas. weed and pest management activities waste management activities, including management of oil spills, sewage, land run-off and toxic contaminants (including any heavy metals) that may occur. iv. The pipeline maintenance regime and relevant through life controls that prevent adverse water quality and significant impact to MNES at the Upper Spencer Wetlands (also known as the BHP Saltfields) and National Heritage Place, CCSZ.	iii. Section 2.8 and Table 2-6 (Maintenance overview) <ul style="list-style-type: none"> Table 2-6 (Maintenance overview) Section 4.3.2.2 (Revegetation and monitoring) Section 4.3.3.2 (Weed Management Plan) Section 2.6.1.12 (Waste) iv. Table 2-6 (Pipeline maintenance)	Further information required
		iv. information about the maximum amount of people present on the proposed action area at any one time, including seasonal variations.	3.4.3 Construction Activities	Adequate.

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<p>2. Description of the environment and matters of national environmental significance.</p> <p>The preliminary documentation must provide a general description of the environment of the development site, as well as the surrounding areas that may be impacted by the action both in the short and long term.</p> <p>Where information was provided in the referral information, but updated information is now available, please provide the updated information.</p> <p>The department could review the adequacy of additional targeted Southern Whiteface (if applicable) surveys including:</p> <ul style="list-style-type: none"> proposed survey design(s) with respective scientific justifications, before being undertaken; and the results of surveys, before gathering Further information outlined in the next para below. <p>A conservative approach through vegetation association mapping and suitable avoidance, mitigation and management strategy or offsets can be considered where it is adequately demonstrated that there are no residual impacts as a result of the proposed action.</p>	<p>a) a description of any protected matters that are, or have the potential to be, in the proposed action area and surrounds. From the information provided to date, the department considers that the protected matters that may be significantly impacted by the proposed action include, but are not limited to:</p> <ul style="list-style-type: none"> i. Western Grasswren (<i>Amytornis textilis myall</i>) – Vulnerable ii. Southern Whiteface (<i>Aphelocephala leucopsis</i>) – Vulnerable iii. Migratory shorebird species iv. Cuttlefish Coast Sanctuary Zone (CCSZ) Heritage Place 	<p>i. The protected matters are identified as either present or potentially present in or adjacent to the proposed action area.</p>	<ul style="list-style-type: none"> Section 1.2 (Identification of protected matters in and around Proposed Action area) Section 3 (Description of existing environment) Section 3.2.2 (identification of listed flora and fauna in and around the Proposed Action area) 	Adequate.
	<p>b) for listed threatened species that are, or have the potential to be present within the proposed action area and surrounds, a minimum of:</p>	<p>i. information on the abundance, distribution, ecology and habitat preferences for Western Grasswren and Southern Whiteface. Provide this in both a regional and local context.</p>	<ul style="list-style-type: none"> Section 4.2.3 (Western Grasswren) Section 4.2.4 (Southern Whiteface) Section 4.2.5 (Malleefowl) 	Further information required
		<p>ii. quantification of the extent of habitat within the proposed action area and surrounding areas, including field mapping of identified known and/or potential habitat and records.</p>	<ul style="list-style-type: none"> Figure 3-4 (mapped vegetation communities showing extent of potential habitat in and around Proposed Action area) Figure 4-3 (Existing records and habitat mapping of Western Grasswren) Figure 4-5 (Existing records and habitat mapping of Southern Whiteface) Figure 4-7 (Existing records and habitat mapping of Malleefowl) 	Further information required
		<p>iii. assessment of the quality, importance, and ecological function (i.e., for foraging, breeding, roosting or dispersal) of known or potential habitat for Western Grasswren and Southern Whiteface within the proposed action area and surrounding areas.</p>	<ul style="list-style-type: none"> Section 4.2.3.2 (Western Grasswren habitat assessment) Section 4.2.4.2 (Southern Whiteface habitat assessment) 	Further information required
		<p>iv. assessment of the presence of population(s) of Western Grasswren and Southern Whiteface within the proposed action area with the number of individuals present, and the size of these populations including historical records within the proposed action area and surrounding areas (including Whyalla Conservation Park). See Appendix B (1.g and 2.a). Information should include a field survey for Southern Whiteface within the proposed action area in accordance with the Survey guidelines for Australia's threatened birds. See Appendix B (2. e-g).</p>	<ul style="list-style-type: none"> Section 4.2.3.2 (Western Grasswren presence) Section 4.2.4.2 (Southern Whiteface presence) Section 4.2.2 Field surveys (including bird survey effort) 	Further information required
		<p>v. justification on how the Western Grasswren and Southern Whiteface are considered stable in a regional context</p>	<ul style="list-style-type: none"> Section 4.2.3.1 and Section 4.3.2.3 (Western Grasswren) Section 4.2.4.1 (Southern Whiteface)). 	Further information required
		<p>vi. justification and evidence to support your position when discussing the Western Grasswren's inferred area of occupancy (AOO) presented in the referral documentation. This approach needs to be consistent with assessing population information at a regional and local level. See Appendix B (1.j).</p>	<ul style="list-style-type: none"> Section 4.2.3.1 (Western Grasswren AOO) 	Further information required

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		<p>vii. assessment detailing capacity for threatened species to disperse into surrounding suitable habitat and the ability of this suitable habitat to support displaced species. With evidence of:</p> <ul style="list-style-type: none"> natural ability of the Western Grasswren and Southern Whiteface to successfully disperse into surrounding habitat. Particularly given the linear nature of the project. success rates of their dispersion. considerations on the timing of dispersion (e.g. breeding and non-breeding season). the ecological quality of dispersion habitat. carrying capacity of dispersion habitat. any impacts to Western Grasswren and Southern Whiteface already inhabiting dispersion area. <p>This information may be provided in a Threatened Species Management plan.</p>	<ul style="list-style-type: none"> Section 4.3.2.3 and Table 4-7 have been updated to address population dispersion impacts and mitigation measures relating to Western Grasswren, including during the breeding season. Section 4.3.2.4 and Table 4-8 have been updated to address population dispersion impacts and mitigation measures relating to Southern Whiteface, including during the breeding season. 	Further information required in Adequacy Review
		viii. an assessment of the adequacy of all surveys undertaken (including survey effort and timing), in particular the extent to which these surveys were appropriate to the Western Grasswren and Southern Whiteface. Surveys should consider the proposal's impact in the context of national, regional, district and site importance to establish the most effective survey technique(s). Justify where variation exists outside of departmental guidelines.	i. Section 4.2.2.2 (Survey adequacy)	Further information required
		<p>ix. information about the methods, data and scientific literature used to identify and assess the environmental values within the proposed action area and surrounds, including survey data and historical records. Survey data relating to the proposed action must be provided for the relevant listed species and be as recent as possible.</p>	<ul style="list-style-type: none"> Section 4.2.1 - Desktop assessment summary Section 4.2.2 - Field survey summary Attachment B – Ecology Baseline Assessment – Chater 2 (Methodology) Attachment C – Significant Impact Assessment – Chapter 2 (Methodology) <p>To address the requirement to provide copies of referenced studies and field surveys:</p> <ul style="list-style-type: none"> Table 4-1 has been updated to clarify the survey type, location and original source report. In Table 4-1 there are four survey reports listed that originate from other projects. Of these, three are published and in the public domain ((EBS, 2023), (Jacobs, 2023b), (Jacobs, 2023c). One report is not yet published (Jacobs, 2023a) and therefore not publicly available. However, the original survey report has been clarified further in the reference list. Two of the above listed reports have been added as new Attachments E (EBS, 2023) and F (Jacobs, 2023b). The references of all listed reports have been updated to identify where the published reports may be accessed. 	Further information required in Adequacy Review
		x. Details of environmental conditions that could drive survey results, e.g. weather, food availability. See Appendix B (1.e).	ii. Section 4.2.2.2 (Survey limitations)	Further information required
<p>3. Relevant impacts</p> <p>The preliminary documentation must include an assessment of the likely short-term and long-term impacts (including direct, indirect, facilitated, and cumulative impacts) that may occur as a result of all elements and project</p>	Describe and assess the likely short-term and long-term impacts (direct, indirect, facilitated, and cumulative) to MNES that are known or likely to occur within the proposed action area and nominated 5 km buffer according to PMST. Cumulative		<p>Assessment of relevant Impacts of MNES, including avoidance, management and mitigation:</p> <ul style="list-style-type: none"> Section 4.3 (threatened Species and Communities), Table 4-3, Table 4-4 and Table 4-5 Section 5.3 (migratory species) 	Further information required

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<p>phases of the proposed action on the protected matter.</p> <p>The department has identified the following impacts as particularly relevant to the proposed action, which include, but are not limited to:</p> <ul style="list-style-type: none"> vegetation clearance including the loss, degradation, and fragmentation of Western Grasswren and Southern Whiteface habitat. Potential impacts to migratory shorebird species arising from adverse water quality, noise and visual disturbance. Potential impacts to the CCSZ National Heritage Place and its recognised values arising from adverse water quality. increased noise, dust, and pest animal in the proposed action area from construction activities which may impact on MNES; increased human and vehicles disturbance within the proposed action area from construction and operational activities, which may impact on MNES. increased noise generation from the operation of the proposed infrastructure creating hearing loss, masking affects, and behavioural changes which may impact MNES. <p>Consideration of impacts must not be confined to the immediate areas surrounding the proposed action but must also consider the potential of the proposed action to impact on adjacent areas that are likely to contain protected matters.</p> <p>It is recommended a risk-based approach be taken to analyse the impacts to species and include relevant mitigations that demonstrate a reduction in the risk.</p> <p>All discussions and conclusions drawn regarding the assessment of direct or indirect impacts from the proposed action should include a full justification based on the best available information. The discussion of impacts must incorporate relevant conservation advice, recovery plans and threat abatement plans, if applicable. If these are not applicable, please state reason/s why.</p>	impacts can be considered at a regional level.		<ul style="list-style-type: none"> Section 6.2 (national heritage places) 	
	a) the direct and indirect loss, disturbance or degradation of habitat from the proposed action. This must include the quality of habitat and total area in hectares, the number of MNES individuals impacted , and the area of potential habitat for the species likely to be impacted .	i. the loss of vegetation and habitat even where considered temporary must be further described and relevant evidence furnished regarding direct and indirect impacts to MNES. ii. the potential for adverse water quality to have a significant impact on protected matters must be further described and relevant evidence furnished. This includes for potential indirect impacts upon migratory shorebird species and the recognised values of CCSZ National Heritage Place as described in the Significant Impact Guidelines 1.1.	i. Habitat loss: <ul style="list-style-type: none"> Section 4.3.2 - temporary habitat loss for listed threatened species and communities No habitat loss for migratory species No habitat loss for national heritage place CCSZ ii. Adverse water quality impacts: <ul style="list-style-type: none"> Section 4.3.3.5 and 4.3.3.6 (threatened species and communities) Section 5.3.3.2 (migratory species) Section 6.2.3.2 and Section 6.2.3.3 (national heritage place CCSZ) 	Further information required
	b) discussion of the risk of introduction of weeds and pathogens during construction and operation activities as relevant to MNES.		Section 4.3.3.2 (weeds and pests)	Further information required
	c) details on whether any impacts are likely to be unknown, unpredictable or irreversible or sub-lethal (i.e., reversible over time) and what confidence is placed on the predictions or relevant impacts.	i. Details on predicted outcomes for the species during what is considered a temporary habitat clearance.	Predicted outcomes for protected matters is presented in the assessment of impact significance: <ul style="list-style-type: none"> Table 4-7, Table 4-8 and Table 4-9. Section 4.3.5 (threatened species and communities) Section 5.3.5 (migratory species) Section 6.2.5 (national heritage places). 	Further information required
	d) analysis of the acceptability of the relevant impacts.	i. Must have greater regard to applicable statutory documents for all relevant protected matters and project specific risk controls with greater reliance on scientific evidence in analysing impacts. ii. Further analysis to describe how the action will or will not result in impacts from fragmentation for the Western Grasswren as a result of the proposed action. Noting that the Conservation Advice for the Western Grasswren (2014) states that the subspecies distribution is severely fragmented and there is a continuing decline the quality of habitat and that the Action Plan for Australian Birds and IUCN data states about the Western Grasswren, that no population viability analysis has been undertaken to determine that the species is not severely fragmented.	<ul style="list-style-type: none"> The assessment of impact significance (referenced above) concluded that no significant impacts are expected on protected matters. Epic Energy considers the low level of impact presented by the Proposed Action is an acceptable level. Table 4-7, Table 4-8 and Table 4-9 (Assessment of significant and residual impacts on relevant species and key mitigation measures) Section 4.3.2.3 and Table 4-7 (Criteria 3) fragmentation impacts on Western Grasswren <p>To address the adequacy review request for further information:</p> <ul style="list-style-type: none"> Section 4.3.2.3 and Table 4-7 have been updated to address population dispersion impacts and mitigation measures relating to Western Grasswren, including during the breeding season. 	Further information required in Adequacy Review
	e) any technical data and other information used or needed to make a detailed assessment of the relevant impacts; and	i. Provide copies of any surveys or ecological reports referenced in the assessment and ensure that the surveys and any other	<ul style="list-style-type: none"> Attachment B – Ecology Baseline Assessment Attachment C – Significant Impact Assessment <p>To address the adequacy review request for provision of copies of cited surveys and reports, refer to the response provided to 2(b)(ix).</p>	Further information required in Adequacy Review

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	<p>f) a local and regional scale analysis of the likely impacts. This should include an assessment of connectivity, and potential short- term and long-term cumulative impacts of the proposed action in the context of regional development within the broader region and information on the long-term viability of Western Grasswren and Southern Whiteface if the proposed action was to proceed. See Appendix B (2.j). With consideration to all relevant past, present and reasonably foreseeable activities within the north Whyalla region.</p>		<p>Local and regional impacts:</p> <ul style="list-style-type: none"> Threatened species and communities - impacts will be localised (Section 4.3.2.7 and Section 4.3.3.1) Migratory species – not applicable, as impact risk was determined to be negligible National heritage places – not applicable, as impact risk was determined to be negligible. <p>Short and long term impacts:</p> <ul style="list-style-type: none"> Threatened species and communities - impacts will be short term: <ul style="list-style-type: none"> Section 4.3.2.3 (Western Grasswren) Section 4.3.2.4 (Southern Whiteface) Section 4.3.2.5 (Malleefowl) Migratory species – not applicable, as impact risk was determined to be negligible National heritage places – not applicable, as impact risk was determined to be negligible. Section 8.3 (long and short term considerations) <p>Cumulative impacts:</p> <ul style="list-style-type: none"> Section 4.3.4 (threatened species and communities) Section 5.3.4 (migratory species) Section 6.2.4 (national heritage places) communities). 	Further information required
<p>4. Proposed avoidance, management, and mitigation measures</p> <p>The preliminary documentation must provide information on specific measures proposed to avoid, mitigate and manage <u>impacts to the relevant protected matters</u> from the proposed action. A detailed description of proposed avoidance, management and mitigation measures as identified in each impact pathway should be presented in the form of management plans. The discussion must incorporate conservation advice, recovery plans and threat abatement plans, where relevant.</p> <p>Mitigations must be assessed and justified for their effectiveness in the context of this proposal and under varying conditions e.g. Weather, change of operations, bushfire.</p> <p>Avoidance and mitigation measures are the primary methods of eliminating and reducing significant impacts on MNES. Where possible and practicable, it is best to avoid impacts. If impacts cannot be avoided, then they should be minimised or mitigated as much as possible. Avoidance and mitigation measures must be investigated thoroughly as a part of the assessment and be supported by evidence to demonstrate likely success.</p> <p>Please provide all avoidance, mitigation, and management measures including but not limited to:</p> <ul style="list-style-type: none"> Western Grasswren (<i>Amytornis textilis myall</i>) – Vulnerable Southern Whiteface (<i>Aphelocephala leucopsis</i>) – Vulnerable Migratory shorebirds of the Upper Spencer Wetlands (also known as the BHP Saltfields) The CCSZ National Heritage Place and its values 	<p>a) address all project phases (pre-construction, construction, operation/maintenance and decommission) of the proposed action.</p>		<p>Pre-construction avoidance/ mitigation measures:</p> <ul style="list-style-type: none"> Section 8.3 (Siting and design changes to avoid impacts) <p>Construction avoidance /mitigation measures:</p> <ul style="list-style-type: none"> Section 2.6.2 (soil erosion and sedimentation, contaminated soil and water, and acid sulfate soils) Section 2.6.3 (watercourse and infrastructure crossings) Section 2.6.1.11 (rehabilitation of right of way) Section 2.6.1.12 (waste management) Section 4.3.2.3 (Western Grasswren and Southern Whiteface) Section 4.3.2.5 (Malleefowl) Section 4.3.3.2 (weeds, pathogens and predators) Section 4.3.3.4 (surface water flows, shorebird and migratory species habitat) Section 4.3.3.5 (surface water quality and downstream marine water quality) Section 4.3.3.6 (groundwater) Section 4.3.3.8 (fire) Section 4.3.3.9 (fauna strike) Section 4.3.3.10 (fauna entrapment) Section 5.3.3.2 (migratory species habitat) Section 6.2.3.3 (national heritage places) Operational phase impacts on protected matters are expected to be negligible to zero. Standard environmental practices and controls will be implemented to avoid environmental impacts, as detailed in the OEMP. Decommissioning phase impacts on protected matters are expected to be negligible to zero. Activities are likely to include the removal of above ground infrastructure (0.16 ha in total) and rehabilitation of the habitat. Standard 	Further information required

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			environmental impact control measures (e.g., for dust, erosion, etc) are expected to be adequate for these activities.	
	b) state the environmental and conservation objectives, performance criteria, monitoring, reporting, corrective action, responsibility and timing for each environmental issue.		<ul style="list-style-type: none"> Table 4-7, Table 4-8 and Table 4-9 (Assessment of significant and residual impacts on relevant species) Attachment D (Threatened species management plan) For migratory species and national heritage places, no significant impact is expected to occur and an environmental monitoring plan for these matters has not been provided. 	Further information required
	c) details of pre-clearance, clearance and construction procedures to ensure that Western Grasswren and Southern Whiteface are adequately detected and managed to minimise impacts (e.g., the translocation management protocols for specific species).		Attachment D (Threatened species management plan)	Further information required
	d) include a description of any rehabilitation of temporarily disturbed areas or retained open spaces (e.g., habitat improvement works within conservation buffer zones). This should also address management, methodology, timing, duration and effort of rehabilitation works.	<p>i. Details of proposed revegetation activities should address Specific, Measurable, Achievable, Relevant and Timebound (SMART) commitments that deliver like for like vegetation and EPBC habitat outcomes.</p> <p>ii. Address any short-term or long-term cumulative impacts on the Western Grasswren and Southern Whiteface, considering concurrent actions in the surrounding north Whyalla area and provide detailed mitigation measures aimed at preventing or minimising impacts to the Area of Occupancy (AOO) for the species.</p>	<p>Proposed revegetation activities:</p> <ul style="list-style-type: none"> Section 4.3.2.2 (reinstatement and reseeded), timeline of activities (progressively, as pipeline is installed, and within 3-6 months of trench backfilling), frequency of monitoring (quarterly until successful, then annually), success criteria (erosion risk/species composition/percentage cover/vegetation height and structure - comparative to adjacent), and remedial actions (site preparation/additional reseeded). <p>Short/long term impacts:</p> <ul style="list-style-type: none"> Section 4.3.2.3 (Western Grasswren) Section 4.3.2.4 (Southern Whiteface) Section 4.3.2.5 (Malleefowl) <p>Cumulative impacts:</p> <ul style="list-style-type: none"> Section 4.3.4 (threatened species and communities), including impacts on AOO of Western Grasswren (0.4%) and Southern Whiteface (0.01 %). Section 5.3.4 (migratory species) Section 6.2.4 (national heritage places) communities). 	Further information required
	e) include maps that illustrate the location of any proposed construction exclusion zones or buffer zones, and details on how these areas will be excluded, or protected.		<ul style="list-style-type: none"> Figure 2-2 and Figure 2-3 (maps of the total disturbance area) including: <ul style="list-style-type: none"> the entire construction right of way lay down areas construction access tracks In response to the adequacy review request for further information, 10 new maps have been added in Appendix G, showing the total disturbance area in greater detail (at 1:10,000 scale): <ul style="list-style-type: none"> Blue Lines: represent existing disturbance areas – which are already cleared of vegetation. Orange Dots: Indicate new and temporary disturbance areas - which are not permanent, but will be rehabilitated following completion of construction. Red Lines: represent permanent disturbance areas – which will remain indefinitely cleared. <p>Pipeline construction will be limited to the defined construction right-of-way shown (as the disturbance footprint) in Section 2.3.</p> <p>Other construction exclusion or buffer zones have not been determined for the proposed action, except in relation to sites of Aboriginal cultural heritage significance.</p>	Further information required in Adequacy Review

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			<p>The proposed construction footprint has been refined and minimised as much as possible to avoid unnecessary vegetation clearance.</p> <p>The CEMP will include maps that clearly define the construction right of way, as well as strict protocols requiring construction workforce to retain all disturbance to within the defined construction right of way.</p> <p>As noted in Section 4.3.2.1, a pre-construction walk-through would also be undertaken with an experienced ecologist, arborist and construction design specialist to further reduce the construction right of way, where possible, and to assist with demarcation of no – go zones for particularly sensitive areas.</p>	
<p>Specific measures should be presented in a detailed management plan for the protected matter likely to be impacted by the proposed action including the environmental objectives, performance criteria, monitoring, reporting, corrective action, responsibility and timing for each environmental issue.</p> <p>Include relevant management plans that will be developed or implemented prior to commencement e.g., Pest and Weed Management Plan, Fauna Management Plan. To assist you, the department’s Environmental Management Plan Guidelines 2014 are available at: Environmental Management Plan Guidelines - DCCEEW.</p> <p>Documentation should clearly set out the following measures for each environmental issue and protected matter likely to be impacted by the proposed action (e.g., in the form of a schedule).</p>	f) details of the vegetation or habitat to be retained must include the location and quantification of the total area, presence of protected matters, protection measures such as fencing and road underpasses, management measures and their suitability with respect to any protected matters present and any conservation arrangements.		<p>All vegetation outside the construction right of way is to be retained. Presently there is no vegetation or habitat earmarked for retention/protection within the construction right of way.</p> <p>As noted in Section 4.3.2.1, a pre-construction walk-through would also be undertaken with an experienced ecologist, arborist and construction design specialist to further reduce the construction right of way, where possible, and to assist with demarcation of no – go zones for particularly sensitive areas.</p> <p>Section 2.3 - Following construction, 99.84 % of the newly cleared vegetation will be rehabilitated.</p>	Further information required
	g) provide details of ongoing research and monitoring programs to support an adaptive management approach and determine the effectiveness of the proposed mitigation measures.		<ul style="list-style-type: none"> Section 4.3.2.2 (revegetation monitoring) Attachment D (Threatened species management plan) 	Further information required
	h) assessment of the expected or predicted effectiveness of the avoidance and mitigation measures for each protected matter. This includes the scale and intensity of impacts of the proposed action and the on-ground benefits to be gained through each of these measures. Where impact on a protected matter is avoided this should be stated.	i. Provide any known data or research for chosen methodology and estimated timing of the proposed natural regeneration and/or revegetation efforts to achieve suitable EPBC habitat outcomes.	Section 4.3.2.2 (based on experience on other sites in the region (in the absence of known data or research), the timeframe of the proposed natural regeneration and active revegetation efforts is highly dependent on rainfall and is estimated at 5-10 years.)	Further information required
	i) discussion of the likely residual impacts to the protected matter after proposed avoidance and/or mitigation measures are taken into account:	i. identify the significant residual impacts on protected matters. ii. Where residual impacts are avoided, provide sufficient justification on how avoidance occurs, drawing on evidence and scientific data. iii. Where residual impacts cannot be reasonably achieved, provide sufficient justification with supported evidence.	<ul style="list-style-type: none"> Section 4.3.5 and 4.3.6 – no significant residual impacts are expected on listed threatened species Section 5.3.5 and 5.3.6 – no significant residual impacts are expected on listed migratory species Section 6.2.5 – no impacts on national heritage places. 	Further information required

Key area	DCCEEW Specific Information required	DCCEEW Sub-point (s)	Proponent comments and where addressed	DCCEEW Adequacy
<p>5. Proposed offsets</p> <p>The preliminary documentation must include an assessment of the likelihood of residual impacts occurring, after avoidance and mitigation management measures have been applied. This includes direct impacts such as habitat clearing and indirect impacts such as degradation of retained habitat.</p> <p>The offset package can comprise a combination of direct offsets and other compensatory measures, so long as it meets the requirements of the EPBC Act Environmental Offset Policy. Offsets should align with conservation priorities and be tailored specifically to the attributes of the protected matter that is impacted, in order to deliver a conservation gain.</p> <p>Offsets should compensate for an impact for the full duration of the impact.</p> <p>Offsets must directly contribute to the ongoing viability of protected matters and deliver an overall conservation outcome that improves or maintains the viability of the ecological community and habitat for protected matters, as compared to what is likely to have occurred under the status quo,</p> <p>i.e. if neither the action nor the offset had taken place.</p> <p>Offsets do not make an unacceptable impact acceptable and do not reduce the likely impacts of a proposed action. Instead, offsets compensate for any residual significant impact.</p> <p>Offsets required by the state can be applied if the offsets meet the department’s EPBC Act Environmental Offsets Policy.</p> <p>Our detailed requirements for offsets will be provided if after provision of information outlined in this request, if it is considered a residual impact applies.</p>	<p>Should there be any residual significant impacts on MNES after the avoidance, mitigation and management measures have been applied then provide details of an offset package proposed to be implemented to compensate for the residual impacts of the project.</p> <p>Provision of a complete offset strategy and its management plan can be considered as condition/s of approval. However, a preliminary strategy at a minimum, should be provided as part of the assessment to demonstrate a reasonable level of feasibility under Part 7 of the EPBC Act Environmental Offsets Policy.</p>	<p>i. details of an offset package (this may be in the form of an offset strategy and offset management plan) including how, when and where the offsets will be delivered and managed.</p> <p>ii. details of how the offset(s) will compensate for the significant residual impacts</p> <p>iii. a description of how the offset(s) will ensure the protection, conservation and management of protected matters for the duration of the impact (i.e. should impacts be in perpetuity, the offsets must also be delivered in perpetuity).</p> <p>iv. a description of how the offset(s) are consistent with relevant Commonwealth policies and guidance documents on offsets under the EPBC Act.</p> <p>v. the anticipated cost (financial and other) of delivery of the offsets(s).</p>		Offset requirement s not assessed at this time.
<p>6. Environmental Outcomes</p> <p>In the event that the Minister decides to approve the action and attach conditions, should you wish to implement or pursue an outcomes-based approach to mitigating and/or offsetting impacts on protected matters, the preliminary documentation must provide information on the outcomes that will be achieved for the relevant protected matters.</p> <p>Outcomes need to be specific, measurable and achievable, and should be based on robust baseline data. Outcomes must be developed in consideration of the Outcomes- based Conditions Policy 2016 and Outcomes- based Conditions guidance 2016 with suitable justification for considerations identified in the policy and guidance.</p> <p>To allow application of outcomes-based conditions, the preliminary documentation should include the specific environmental outcomes to be achieved. It should also include the reasoning for these, including reference to any recovery plan, conservation advice or threat abatement plan that may be relevant to the protected matters.</p>	<p>a) the risks associated with achieving the outcome.</p> <p>b) the measurability of the outcome, including all suitable performance measures.</p> <p>c) appropriate baseline data upon which the outcome has been defined and justified.</p> <p>d) the likely impacts that the proposed outcome will address.</p> <p>e) demonstrated willingness and capacity of achieving the outcome.</p> <p>f) the level of knowledge about the protected matter or its surrogate, upon which outcomes were based.</p> <p>g) discussion of the appropriateness of any surrogates for protected matter outcomes.</p> <p>h) commitments to independent and periodic audits of performance towards achieving outcomes.</p>		Not Applicable - Epic Energy do not wish to implement an outcomes based approach to mitigating or offsetting impacts on protected matters.	Further information required

Key area	DCCEEW Specific Information required	DCCEEW Sub-point (s)	Proponent comments and where addressed	DCCEEW Adequacy
For each proposed outcome, the information must include the specific information presented.	i) assessment of the likely level of control that the proponent will have in achieving the outcome. j) details of proposed management to achieve the outcome, including, but not limited to performance indicators, periodic milestones, proposed monitoring and adaptive management, and record keeping, publication and reporting processes.			
7. Social and Economic matters The preliminary documentation must address the economic and social impacts (both positive and negative) of the proposed action. Consideration of economic and social matters may include the specific information requested. Economic and social impacts should be considered at the local, regional and national levels. Details of the relevant cost and benefits of any alternative options to the proposed action may also be requested.	a) details of any public consultation activities undertaken, and the outcomes.		Section 7.1 (public consultation)	Adequate.
	b) details of any consultation with indigenous stakeholders.	i. Please provide evidence of Native Title land tenure and holders. ii. Please give further evidence of effective engagement with First Nations people and communities with regards to The Interim Engaging with First Nations People and Communities on Assessments and Approvals under Environment Protection and Biodiversity Conservation Act 1999 (interim guidance) .	<ul style="list-style-type: none"> Section 3.1.1 Section 7.1.2 and Section 7.2 (traditional owners consultation) 	Further information required
	c) any monitoring programs to monitor ongoing changes to economic and social characteristics potentially affected by the proposed action.		Section 7.3.2 (monitoring and evaluation)	Further information required
	d) projected economic costs and benefits of the project, including the basis for their estimation through cost/benefit analysis or similar studies.		<ul style="list-style-type: none"> Section 7.4.2 to Section 7.4.5 (projected economic and social benefits of the proposed action). In response to the adequacy review request for information, Section 7.4.1 has been added to address the projected costs of the proposed action. 	Further information required in Adequacy Review
	e) employment opportunities expected to be generated by the project at each phase of the proposed action.		Section 7.4.1 (employment opportunities)	Further information required
	f) benefits to the local and wider community as a result of the proposed action.		Section 7.4 (economic costs and benefits)	Further information required
8. Ecologically sustainable development Provide a description of the proposed action in relation to the principles of ecologically sustainable development, as defined in the EPBC Act.	a) the long-term and short-term economic, environmental, social and equitable considerations.		Section 8.1 (Ecologically Sustainable Development – long and short term considerations)	Further information required
	b) the principles of inter-generational equity which states that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations.		Section 8.2 (intergeneration equity)	Further information required
	c) the conservation of biological diversity and ecological integrity should be a fundamental consideration in decision-making.		Section 8.3 (biodiversity and ecological integrity)	Further information required
	d) improved valuation, pricing and incentive mechanisms should be promoted.		Section 8.4 (valuation/pricing/incentives)	Further information required
9. Environmental record of person(s) proposing to take the action The information provided must include details of any proceedings under a Commonwealth, State or Territory law for the protection of the environment or	a) the person proposing to take the action.		Table 9-1 (details of corporation taking the action)	Adequate.
	b) for an action for which a person has applied for a permit, the person making the application.		Not applicable - not a person	Adequate.

Key area	DCCEEW Specific Information required	DCCEEW Sub-point (s)	Proponent comments and where addressed	DCCEEW Adequacy
the conservation and sustainable use of natural resources against:	c) if the person proposing to take the action is a corporation, details of the corporation’s environmental policy and planning framework must also be included.		Section 9.1 (Environmental Management System)	Adequate.
	d) a description of any approval that has been obtained or is required to be obtained from a state, territory or commonwealth agency or authority (other than an approval under the EPBC Act), including any conditions that apply (or are reasonably expected to apply) to the action.		Section 9.2 (environmental records)	Adequate.
10. Other approvals and conditions The preliminary documentation must include information on any other requirements for approval or conditions that apply, or that the proponent reasonably believes are likely to apply, to the proposed action. This must include:	a) a description of the monitoring, enforcement and review procedures that apply, or are proposed to apply, to the action.		Section 10 (other approvals)	Adequate.

Attachment B Baseline Ecology Assessment

Whyalla Hydrogen Pipeline Project Baseline Ecology Assessment

Epic Energy



LATHWIDA
ENVIRONMENTAL



28 November 2024
Final Report

Document status

Revision	Doc Type	Reviewed By	Approved By	Date Issued
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Disclaimer

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Lathwida accepts no liability or responsibility whatsoever for, or in respect of, any use of, or reliance upon, this report by any third party.

This report should be read in full, and no excerpts are to be taken as representative of the findings. No responsibility is accepted by Lathwida for use of any part of this report in any other context.

The sole purpose of this report and the associated services performed by Lathwida is to document results of the historical reports for the survey area and results of two field assessments. This document and associated data will support the development of primary approval documentation required for the Whyalla Hydrogen Pipeline project in South Australia near Whyalla. The report is based on a desktop review of available data and reports outlining survey findings within the survey area and buffers for Epic Energy. The scope of services, as described in this report, was developed with the Client.

In preparing this report, Lathwida has relied upon, and presumed accurate, any information (or confirmation of the absence thereof) provided by the Client and/or from other sources. Except as otherwise stated in the report, Lathwida has not attempted to verify the accuracy or completeness of any such information. If the information is subsequently determined to be false, inaccurate or incomplete then it is possible that our observations and conclusions as expressed in this report may change.

Lathwida collected and reviewed data and information available in the public domain at the time or times outlined in this report. The passage of time, manifestation of latent conditions or impacts of future events may require further examination of the project and subsequent data analysis, and re-evaluation of the data, findings, observations and conclusions expressed in this report. Lathwida has prepared this report in accordance with the usual care and thoroughness of the consulting profession, for the sole purpose described above and by reference to applicable standards, guidelines, procedures and practices at the date of issue of this report. For the reasons outlined above, however, no other warranty or guarantee, whether expressed or implied, is made as to the data, observations and findings expressed in this report, to the extent permitted by law.

Note on currency

Where possible, information contained in this Document is up to date as at November 2024. This was not possible for supporting appendices, and information based on those appendices, which were prepared by third parties (as discussed in the second paragraph in the Disclaimer above) prior to the Document being finalised.

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Executive summary

Lathwida Environmental was contracted by Epic Energy to undertake a baseline ecological assessment for the Whyalla Hydrogen Pipeline (WHP) Project, which is associated with the 'the Hydrogen Jobs Plan' (HJP) being pursued by the South Australian Government. This document represents the findings of a desktop assessment and field assessments regarding biodiversity values associated with the regulatory and planning expectations of the South Australian (SA) Government, specifically the Department for Energy and Mining under the *Energy Resources Act 2000* (SA) (ER Act). The outcomes of the assessment support the relevant approvals process; stage 1 Licence application (Preliminary Survey Licence (PSL) and stage 2 Environmental Assessment (Environmental Impact Report (EIR) and draft Statement of Environmental Objectives (SEO), as well as project obligations under the *Environment Protection for Biodiversity and Conservation Act 1999* (Cth) (EPBC Act).

Epic Energy has been granted a PSL over the PSL Area, the proposed pipeline corridor, the subject of an EPBC Referral and other approval documents (EIR), is a smaller area within the PSL Area; the Project Area. This area has been refined as several options were considered. The final Disturbance Footprint includes a buried looped pipeline within the Project Area.

The outcomes of the desktop assessment provide summary information about the existing environment of the PSL Area and the wider Study Area (PSL Area plus a buffer of 5 km). This information is combined with the outcomes of three field surveys (December 2023, March and August 2024) to inform the likelihood of occurrence of threatened species within the PSL Area and ultimately the Project Area and proposed Disturbance Footprint. The field surveys included vegetation assessments, using Bushland Assessment Methodology (BAM), as required by the *Native Vegetation Act 1991* (SA) (NV Act) (Native Vegetation Council 2020b), targeted Western Grasswren / Southern Whiteface survey and targeted searches for Malleefowl nesting mounds.

Broadly the PSL Area comprises five vegetation groups; chenopod shrubland, mallee, acacia woodland, casuarina woodland, and samphire shrubland. Whilst detailed vegetation assessment already exists west of the Lincoln Highway (Jacobs 2023a), there were gaps within the portion of the PSL Area east of Lincoln Highway, where the majority of the Project Area and disturbance is proposed for the WHP project. The current assessment uses sixteen BAMs sites to describe the following vegetation communities in the Project Area, east of Lincoln Highway:

- Mallee and low woodlands with open sclerophyll shrub over Chenopods on sand plains / low dunes over calcareous loams, including vegetation associations such as Red Mallee low woodland, False Sandalwood +/- Red Mallee over chenopod shrubland and Open Red Mallee +/- False Sandalwood/ Bullock Bush over Bluebush Daisy and Chenopod and Red Mallee low woodland.
- Low open woodlands of Western Myall +/- Black Oak over Chenopods, including vegetation associations such as Western Myall over Black Bluebush, Pearl Bluebush and Bladder Saltbush on loamy plains; Western Myall / Black Oak over Pearl Bluebush, Black Bluebush, Bladder Saltbush shrubland.



- Samphire +/- Chenopod shrublands with infrequent inundation/saline soils, including vegetation associations such as Samphire / Mallee Hemichroa low shrubland on saline soils.
- Low Open Chenopod Shrublands, including vegetation associations such as Black Bluebush / Bladder Saltbush low shrubland, Bladder Saltbush +/- Pearl Bluebush +/- Samphire and areas with clusters of emergent trees (e.g. False Sandalwood).
- Coastal Shrublands including vegetation associations such as tall sclerophyll shrubland on sand.

The sixteen BAM sites, along with 52 vegetation check points were used to update the vegetation mapping for the PSL Area, in particular areas that had not been ground-truthed as part of other surveys for the broader HJP project.

The targeted Western Grasswren survey effort included over 192 hours of Song Meter effort, as well as 21 hours of bird surveys at the deploy sites. Western Grasswren were detected at three of the four deploy sites, east of Lincoln Highway. However it is noted that Western Grasswren were also detected in the vicinity of the fourth Song Meter site. Western Grasswren were also detected at one site along Port Bonython Road and one site along Fitzgerald Bay Road. The targeted Malleefowl mound searches did not detect any evidence of the species and refined the area of suitable habitat (primarily foraging) within the proposed disturbance area. The survey effort for both species exceeded the requirements of the National threatened bird survey guidelines.

The outcomes of the EPBC Act Protected Matters Search Tool suggested one Threatened Ecological Community (TEC), 50 threatened species and 45 migratory species have potential to occur in the Study Area (PSL Area and 5 km surrounds). The findings of the likelihood assessment concluded the following:

- One Vulnerable TEC (*Subtropical and Temperate Coastal Saltmarsh* (Vulnerable) occurs adjacent the PSL Area (south of the Whyalla Salt pans / saltfields / evaporation pans). Areas with direct tidal influence are avoided by the Project, whilst 2.8 ha of Samphire / Chenopod habitat mapped as 'stranded saltmarsh or not mapped as saltmarsh occurs within the Disturbance Footprint.
- Three Nationally threatened flora species are considered unlikely to occur in the PSL Area, and two species have potential to occur in the PSL Area and the Project Area; Yellow Swainson-pea (*Swainsona pyrophila*) in mallee habitats and Bead Samphire (*Tecticornia flabelliformis*) (in samphire habitats). Although the Bead Samphire was not suggested by the EPBC PMST and is more likely to occur in areas that represent the Saltmarsh TEC and have tidal connection, rather than the small areas (2.8 ha) of stranded saltmarsh that overlap with the Project Area. These species have not been detected within the Disturbance Footprint to date.
- Whilst the PMST suggested 46 threatened fauna have potential to occur, 22 marine and oceanic species were not considered further. Of the 24 threatened fauna considered (22 birds, one mammal and one reptile), three are known in the PSL Area / Project Area (Western Grasswren, Malleefowl, Southern Whiteface) and two have potential to occur (Blue-wing Parrot, Grey Falcon). The remaining nineteen species are considered unlikely, however ten of these are shorebirds that have potential to occur or are known to visit the adjacent saltfields / salt evaporation ponds (Ruddy Turnstone, Sharp-tailed Sandpiper, Red Knot, Curlew Sandpiper, Great Knot, Greater Sand Plover, Eastern Curlew, Eastern Hooded Plover, Fairy Tern and Common Greenshank). Some of these species may also occur in stranded saltmarsh / samphire areas following rainfall.

- There are records for five state-listed flora. Three are considered unlikely to occur and two are considered likely; Sandalwood (*Santalum spicatum*) and Australian Broomrape (*Orobanche cernua* var. *australiana*) but have not been detected in the Project Area to date.
- There are records for an additional 27 state-listed fauna within the Study Area. Several of these species are considered unlikely given lack of suitable habitat or records are more likely for the common species and rated species do not occur in the location of the PSL Area. A number of aquatic / aquatic species are more likely to occur in the saltfields adjacent the PSL Area but are unlikely in the Project Area.
- There are existing records for 20 exotic flora and 11 exotic fauna in the Study Area. Nineteen of the flora species are Declared under the *Landscape Act SA* and seven of these are also Weeds of National Significance (WoNS). A number of these species were detected during field assessments of the PSL Area / Project Area; Horehound (Declared), Prickly Pear and African Boxthorn (both Declared and WoNS). A European Fox and evidence of European Rabbit was also detected during the surveys.

Preliminary information is also provided that will inform native vegetation clearance offset requirements under the NVC Significant Environmental Benefit Offset Policy.

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1 Purpose of report

This document presents a baseline ecology assessment for the Whyalla Hydrogen Pipeline (WHP) Project (the WHP Project, or the Project) which is associated with the Hydrogen Jobs Plan (HJP) being pursued by the Government of South Australia. Epic Energy is the proponent of the Project. Epic Energy is the operator of existing Whyalla Gas Lateral pipelines Figure 1.2.

Lathwida Environmental (Lathwida) has been contracted to conduct a desktop assessment and field assessments regarding biodiversity values associated with the regulatory and planning expectations of the South Australian (SA) Government, specifically the Department for Energy and Mining under the *Energy Resources Act 2000* (SA) (ER Act). The outcomes of the assessment support the relevant approvals process including stage 1 Licence application (Preliminary Survey Licence (PSL)) and stage 2 Environmental Assessment (Environmental Impact Report (EIR)) and draft Statement of Environmental Objectives (SEO). The outcomes will also inform the project obligations under the *Environment Protection and Biodiversity and Conservation Act 1999* (Cth) (EPBC Act).

Studies undertaken to date for the broader HJP project provide an understanding for the presence (or absence) of EPBC listed threatened species in the PSL Area. However further ground-truthing of state mapped vegetation and undertaking bird surveys, where suitable habitat is present, was required to update the status regarding biodiversity values, particularly for areas east of Lincoln Highway. Recent studies (Jacobs 2023a) of the PSL Area indicated focus EPBC listed species for the general location; Western Grasswren (*Amytornis textilis myall*), Malleefowl (*Leipoa ocellata*), Southern Whiteface (*Aphelocephala leucopsis*) and Blue-winged Parrot (*Neophema chrystoma*). The document presents the results of further vegetation ground-truthing and updated vegetation mapping, along with surveys to determine presence or likelihood status of the focus species. In addition, bird surveys included opportunistic observations for other bird species that have potential to occur in the area (e.g. migratory shorebirds and the rarely sighted Grey Falcon (*Falco hypoleucos*)).

1.1 Relevant area

Epic Energy was granted a PSL by the Government of South Australia's Department for Energy and Mining under the *Energy Resources Act 2000* (SA) (recently replaced by the ER Act), which entitles Epic Energy to access land within the PSL Area for the purposes of carrying out survey work, geotechnical investigations and associated planning activities for the proposed construction and operation of the Project. The PSL Area is a broad area to allow for refinement and re-alignment of proposed pipeline corridors where required. The area subject to the PSL is set out in Figure 1.2 (PSL Area).

Notwithstanding that Epic Energy has been granted a PSL over the PSL Area, the proposed pipeline corridor, the subject of an EPBC Referral and other approval documents (EIR), is a smaller area within the PSL Area, the Project Area within which the proposed Disturbance Footprint will occur (Figure 1.3). For the baseline assessment the whole PSL Area was assessed, given five pipeline options were initially considered to enable consultation and engagement with a number of key stakeholders (e.g. cultural, ecological, engineering, land use, economic). The final alignment selection is the subject of further assessment and

input from key stakeholders. This assessment provides the baseline flora and fauna context within the PSL Area and the wider Study Area (e.g. 5 km buffer on PSL Area for desktop assessment, see Section 2).

1.2 Project objectives

The broad objectives of the baseline assessment was to provide baseline ecological data to inform impact assessment for the approvals, provide preliminary SEB offset information and identify data gaps to inform approvals.

The objectives were achieved by conducting the following:

- A desktop assessment establishing the site ecological context, comprising:
 - review of the proposed alignment options and potential interaction with any Matters of National Environmental Significance (MNES) under the EPBC Act
 - review of outputs from recent surveys associated with the HJP project and Northern Water Project
 - review of recent data (e.g. Biological Databases of South Australia (BDBSA)).
- Field assessments for gaps in available data (e.g. targeted threatened species surveys, vegetation survey to inform mapping and approvals).
- Mapping updates for gaps within the PSL Area and associated Project Area.
- A likelihood of occurrence assessment for threatened species based on desktop and field assessment outcomes.
- Summarising results to inform a significant impact assessment under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act) (the focus of Lathwida 2024a)

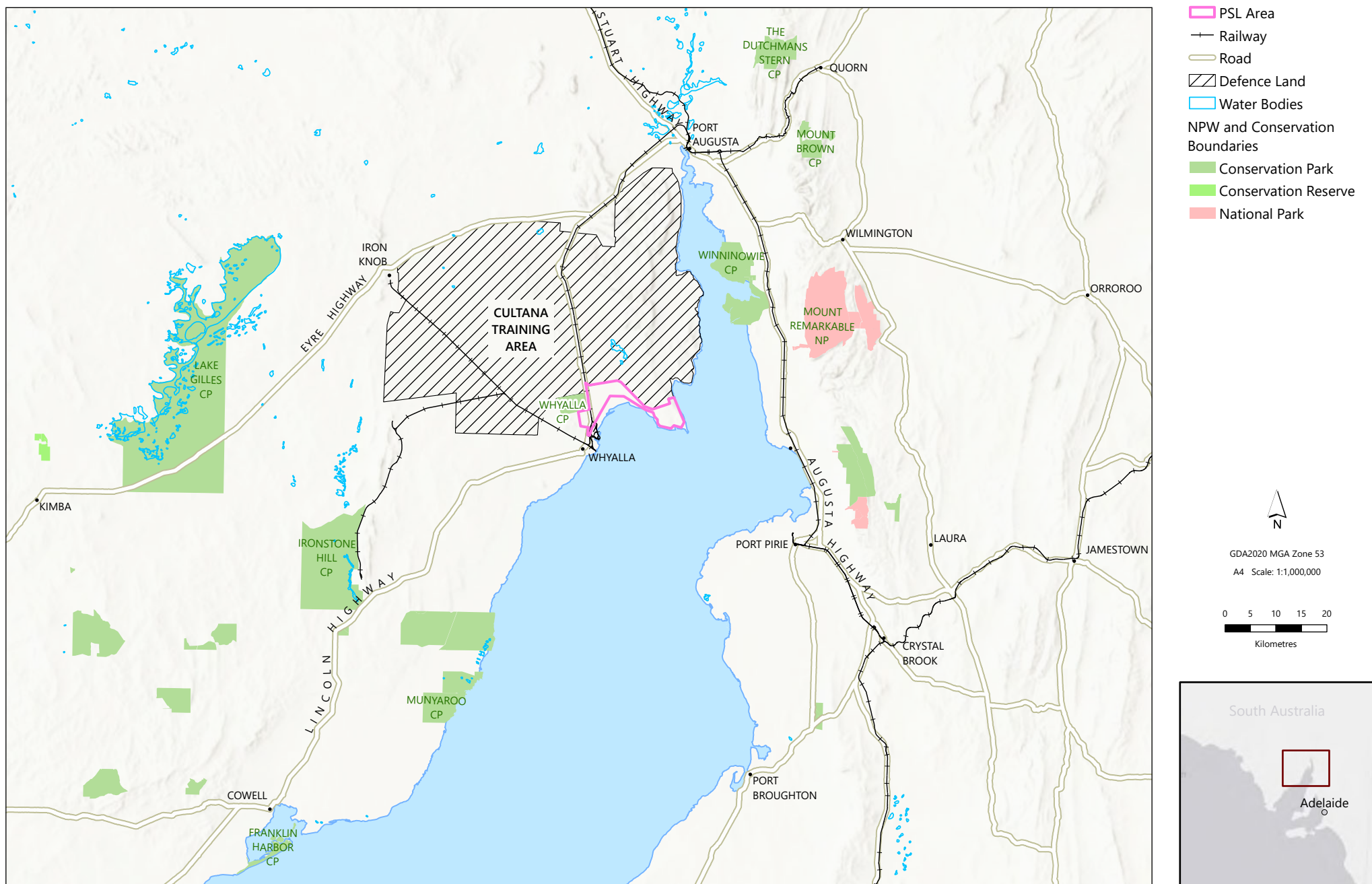


Figure 1.1: Project location

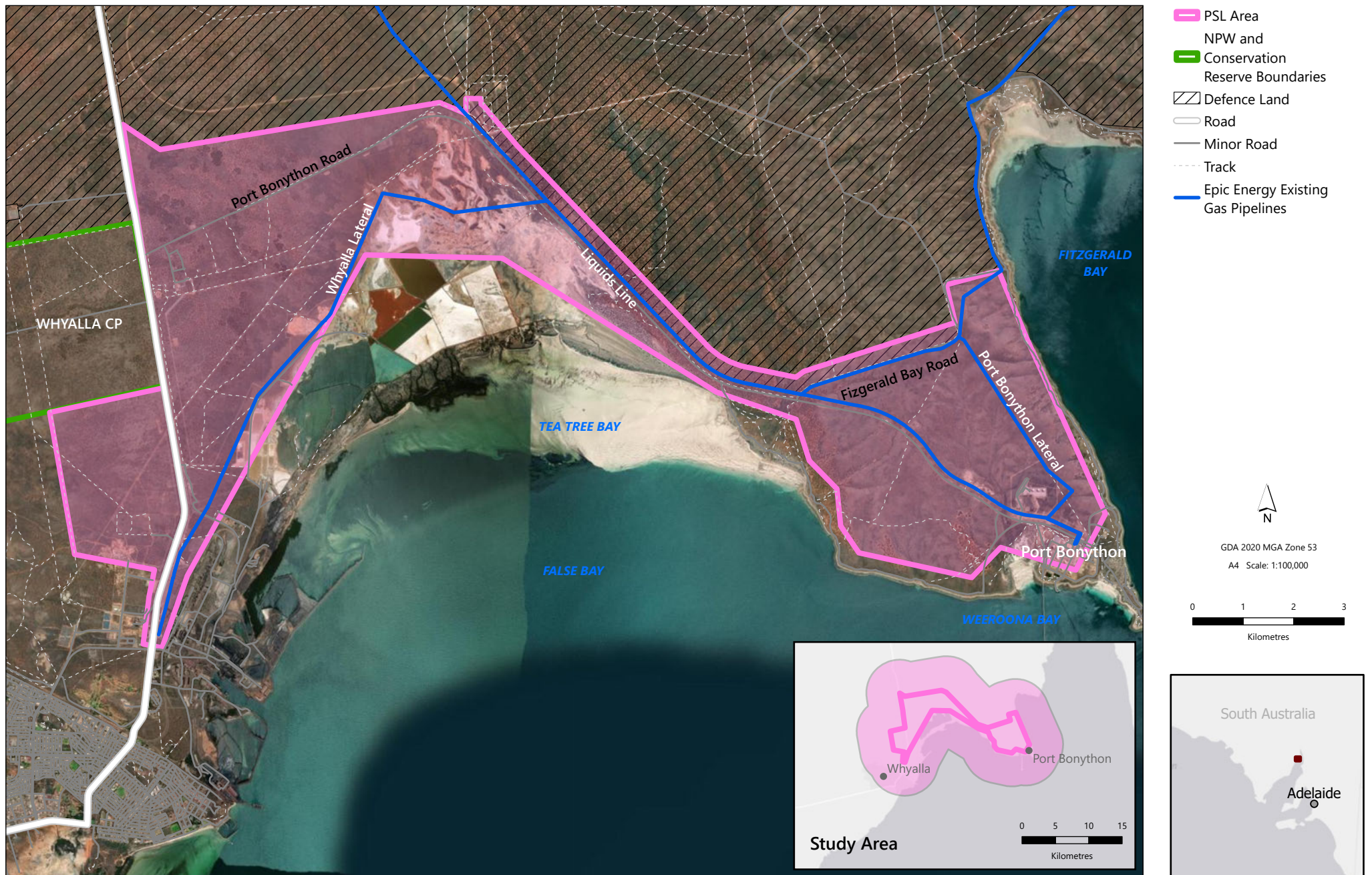


Figure 1.2: Preliminary Survey Licence (PSL) Area



Figure 1.3: Project Area



Figure 1.4: Proposed pipeline

1.3 Project background

A number of ecological assessments have been undertaken in the project region for mining and Department of Defence (DoD) projects and the SA Government's HJP Project and Northern Water Project. Results from the previous studies, along with current literature have been used to continue to build on likelihood of occurrence assessments. The likelihood of occurrence assessments are briefly presented here, primarily given additional species that occur in the region were listed in March 2023 (refer to Section 3 for further detail).

1.4 Regulatory framework

Legislation relevant to ecological aspects of the project is summarised below.

1.4.1 Environment Protection and Biodiversity Conservation Act 1999 (Cth)

The EPBC Act is the Australian Government's central piece of environmental legislation. It provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities and heritage places — defined in the EPBC Act as Matters of National Environmental Significance (MNES). Under the environmental provisions of the EPBC Act, actions that are likely to have a significant impact on a MNES are identified as 'controlled actions' and cannot be undertaken without referral to the Department of Climate Change, Energy, the Environment and Water (DCCEEW) for consideration and approval under the EPBC Act.

The nine MNES identified in the EPBC Act are:

- world heritage properties
- national heritage places
- wetlands of international importance (listed under the Ramsar Convention)
- threatened species and ecological communities
- migratory species as listed under international agreements
- Commonwealth marine areas
- the Great Barrier Reef Marine Park
- nuclear actions (including uranium mining)
- a water resource, in relation to coal seam gas development and large coal mining development.



1.4.2 Native Vegetation Act 1991 (SA)

In South Australia, clearance of native vegetation requires approval from the Native Vegetation Council (or Delegate in DEW) under the *Native Vegetation Act 1991* (SA) (NV Act) and *Native Vegetation Regulations 2017* (the Regulations). There are associated guidelines related to assessment and offset for approved vegetation clearance (NVC 2024a, 2024c, 2024d).

The NV Act and the Regulations outline incentives, education measures, and assistance to landowners in relation to the preservation and enhancement of native vegetation and acts to control the clearance of native vegetation. Under the NV Act, legal clearance of native vegetation may be permissible through one of two mechanisms: either by an application to the Native Vegetation Council (NVC), or under exemptions contained within the regulations (NVC 2024a, 2024b, 2024c, 2024d).

Remnant native vegetation is present within the PSL Area and is broadly represented in Government of South Australia's Department for Environment and Water (DEW) remnant vegetation mapping layers (NatureMaps 2024, Figure 3.2), in addition to being mapped as occurring within the footprint during recent field surveys for the Northern Water Project (refer Section 3.2, Jacobs 2023a).

The WHP Project occurs within the Eyre Peninsula (EP) Landscape Management Region (LMR) (refer Section 1.4.4), therefore any potential impacts to vegetation and associated offset (as Significant Environmental Benefit (SEB)) calculation require vegetation to be assessed via the NVC Bushland Assessment Method (BAM) (NVC 2024b). The associated BAM assessments also incorporate desktop reviews that interrogate a minimum 5 km buffer on the impact area. It is understood The WHP Project will require clearance or disturbance of native vegetation for trenches associated with a buried loop pipeline, in addition to ancillary infrastructure (e.g. compressor station, and valve station).

1.4.3 National Parks and Wildlife Act 1972 (SA)

The *National Parks and Wildlife Act 1972* (SA) (NPW Act) allows for the protection of habitat and wildlife through the establishment of parks and reserves (both on land and in State waters) and provides for the use of wildlife through a system of permits allowing certain actions, i.e. keeping, selling, trading, harvesting, farming, hunting and the destruction of native species. The NPW Act assigns species to state conservation categories; Endangered (as listed under Schedule 7), Vulnerable (Schedule 8), and Rare (Schedule 9). Habitats that support conservation-listed species represent elevated value, the potential impacts to which should be avoided, mitigated and or appropriately managed.

The Act and the associated National Parks and Wildlife Regulations 2019 are administered by the Department for Environment and Water. Where a project includes vegetation clearance, impacts to state threatened species (flora and fauna) are incorporated into vegetation condition scores and offset calculations for approved clearance as per the BAM assessment and SEB guidelines (NVC 2024b, 2024c, 2024d).



1.4.4 Landscape South Australia Act 2019 (SA)

The *Landscape South Australia Act 2019* (SA) (LSA Act) replaced the *Natural Resources Management Act 2004* (SA) [ceased] as the key framework promoting the sustainable and integrated management of the State's natural resources (land, water, biodiversity) and for the management of pest plants and animals. Under the LSA Act, South Australia is divided into eight regional Landscape South Australia Boards, of which the PSL Area falls within the Eyre Peninsula Lands Landscape Boards, managed by the Government of South Australia. Each board develops its own Regional Plan designed to meet the needs of the local regions and contribute to state level planning.

In the context of the proposed project, the LSA Act guides biodiversity management (including management of pests, exotic flora and fauna) and as mentioned in Section 1.4.2 the location of assessment areas influences the method of vegetation assessments (in this case BAM applies) required for any proposed impacts to native vegetation and associated approvals.

1.4.5 Energy Resources Act 2000 (SA)

Pipelines and onshore petroleum, geothermal and gas storage exploration and development in South Australia are administered by the ER Act and associated Energy Resources Regulations 2000.

The licensing and approvals process for transmission pipeline projects in South Australia, under the ER Act and associated regulations, consists of three stages (DEM 2019):

- Stage 1: Licencing grant of licence authorising the licensee to carry out the specific activity to which the licence relates.
- Stage 2: Environmental assessment and approval of environmental objectives: assessment and approval of environmental objectives required to be achieved by a proponent and upon which the Department for Energy and Mining (DEM) will regulate it against.
- Stage 3: Activity notification and approval: submission of location-specific activity notification for assessment and approval where required.

1.5 Project Definitions

For the purpose of this baseline ecology assessment for the Project, the following terminology has been adopted:

- The Whyalla Hydrogen Project (the Project).
- The Whyalla Hydrogen Facility: the facility to be constructed and operated by, or on behalf of, the Office of Hydrogen Power South Australia (OHPSA) in North Whyalla to produce hydrogen to be stored and transported by the Project.
- The PSL Area: being the area (7,233 ha) subject to the PSL granted in favour of the ER Act (Figure 1.2).
- The Project Area: a smaller area (1,509 ha) within the PSL Area which includes the pipeline corridor and including a buffer along the corridor which is the subject of an EPBC referral under the EPBC Act and an EIR under the ER Act (Figure 1.3).
- Disturbance Footprint: being the area of anticipated disturbance required within the Project Area for the proposed pipeline alignment and ancillary infrastructure (e.g. valve stations, tracks, laydown) associated with the construction and operation activities, as well as buffer areas to enable safe execution of construction activities. This Disturbance Footprint includes one buried looped pipeline that is approximately 45 km in length (22.5 km right of way) (Figure 1.4). The temporary disturbance encompasses 134 ha, which includes 32 ha of existing disturbed areas (e.g. tracks and other cleared areas). The new temporary disturbance will be 102 ha and of this 0.16 ha will be permanent clearance.
- Study Area: 5 km buffer on the PSL Area (Figure 1.2).
- The road traversing east of Lincoln Highway is Gazetted as Port Bonython Road, but is also known as Point Lowly Road.

2 Methodology

The focus of the baseline assessment included ecological values within the PSL Area (Figure 1.2) and the Study Area (5 km buffer on the PSL Area). Given the amount of recent work that has occurred in and around the PSL Area, the study involved desktop assessments and three field surveys primarily for target species and vegetation data gaps, as described below.

2.1 Desktop assessment

The desktop assessment included:

- A review of the relevant documents and databases:
 - EPBC Act Protected Matters Search Tool (EPBC PMST) output from the boundary of the PSL Area with a 5 km buffer, 31 January 2024 (Appendix A). A 5 km buffer was used to align with project approval requirements (e.g. vegetation clearance approval requirements for the EP LMR / Bushland Assessment Method (NVC 2024b))
 - Biological Databases of South Australia (BDBSA) records, including BirdLife SA records, within the Study Area. Only recent (since 1995) and reliable (<1 km reliability) records were included in the assessment (historical records referred to where relevant) (BDBSA 2023)
 - DEW NatureMaps website for relevant ecological constraints (DEW 2024)
 - Atlas of Living Australia (ALA), where necessary for species distributions or where additional species information is required (ALA 2024)
 - previous studies in and adjacent the PSL Area including existing vegetation and habitat data that has already been collected for the HJP and extrapolated for the associated proposed pipeline (e.g. Jacobs 2023a, 2023b, 2023c, EBS 2023)
 - publicly available literature (e.g. Species Profile and Threats Database (SPRAT), Threatened Species Conservation Advice and Recovery Plans, and the Commonwealth Survey Guidelines for Australia's Threatened Bird (DEWHA 2010)).
- Results of the desktop assessment were used to inform field assessment preparation and site selection (refer Section 2.2). Desktop outcomes were also used to inform a likelihood of occurrence assessment for species considered to have potential to occur in the PSL Area as per PMST output (refer Section 2.5).
- Naming conventions for flora and fauna common names as per DEW vascular plants taxonomy and fauna taxonomy.

2.2 Field assessment

Three field surveys were undertaken to in-fill vegetation data gaps (i.e. required to inform vegetation mapping, habitat mapping, impact assessment and for future approvals) and target key threatened species. Survey One was for Western Grasswren (December 2023) and Survey Two was targeted for Malleefowl (March 2024). and Survey Three filled in gaps for both species, aligning with slight changes to the Project Area. All surveys also included vegetation assessments (BAM), and vegetation checks (e.g. ground-truth of existing vegetation mapping and a photo). Further details are provided below.

Following field assessment, consolidation of bird survey results and Song Meter analysis were used to inform the likelihood of occurrence and baseline ecology of the PSL Area. Similarly, vegetation assessments (BAM), vegetation check data and photo point data were used to update vegetation mapping for the Study Area.

2.2.1 Western Grasswren

The Commonwealth Survey Guidelines for Australia's Threatened Bird (DEWHA 2010, pp.207) refers to the 'Thick-billed Grasswren (Gawler Ranges) (*Amytornis textilis myall*)', which is now known as Western Grasswren in the region of the Project. The guidelines (DEWHA 2010) suggest survey effort for species detection should include:

- area searches and transect surveys early in the morning in suitable habitat (e.g. Chenopod shrublands with Dead Finish (*Acacia tetragonophylla*) or Black Bluebush (*Maireana pyramidata*). Also occurs in saltbush (*Atriplex sp.*) and bluebush (*Maireana sp.*) shrublands with sparse or open trees or shrubs such as Western Myall, Black Oak, Bullock Bush, False Sandalwood (Sugarwood) and Australian Boxthorn (DEWHA 2010)
- detection via calls and / or sightings
- response to broadcast surveys during the breeding season (June to September), although it is noted that the species responds to sufficient rainfall and in recent years has been detected in the region in December (Jacobs 2023b, Infrastructure SA 2024))
- 15 person hours of survey over three days in areas less than 50 ha
- noting, failure to detect the species should be reported as 'not detected', not absent (DEWHA 2010).

During Survey One Song Meter deployment in suitable habitat was used as the key means of detection, hence person survey hours were reduced (see Section 2.2.1) regarding Song Meter deployment). The focus of this targeted survey was the Western Grasswren, however given the overlap in habitat with other EPBC species of interest (e.g. Southern Whiteface, Blue-winged Parrot and Grey Falcon), detection of other species was also considered. Species lists were developed for each Song Meter Site visited, including species detected opportunistically while travelling around the PSL Area.

Broadly, the field survey involved the following:

- Ground-truthing broad vegetation description across the PSL Area against existing mapping (Jacobs 2023a, 2023b) and SA Vegetation mapping. This was achieved by logging a 'Vegetation Check' point and taking a minimum of one photo, along with a brief description of the vegetation community / dominant species that were present.
- Vegetation survey (BAM survey sites, as per Section 1.4.2), including collection of north, east, south, west photos of the site.
- Bird Surveys (BS). This involved conducting roaming area search bird surveys and recording all species detected (individuals, signs of presence). Surveys were only conducted at Song Meter sites given the survey was targeted to the most suitable habitat within the PSL Area east of Lincoln Highway. There was a focus on detecting the high pitch call of the Western Grasswren. Surveys were conducted during active periods (e.g. in the am until 11am and between 3pm and 5pm in the afternoon). Given the survey was at the end of the breeding period (Survey 1) or beginning (Survey 2), where young may be present, ethical birding was undertaken. Brief playing of relevant species calls via a smart phone / bird application were used sparingly to check identify if birds were cryptic and not showing themselves. Surveys were generally undertaken for 20 to 30 minutes at each site by separate observers (ranging over different areas), concurrently with vegetation assessment. In addition, species were also recorded opportunistically whilst traversing around the site.
- Song Meter deployment (refer below).
- Habitat Assessment. BAM / Song Meter sites were assessed regarding the suitability and quality of the habitat for Western Grasswren. Key features included presence of preferred Chenopod species and / or spiny shrubs, height and density of these species and presence of other habitat features (e.g. grassy understory / weedy understory versus bare patches were considered). Habitat quality categories are summarised as follows:
 - Habitat quality 1: Unsuitable – not expected to occur, contains minimal or no recognized habitat qualities for the species.
 - Habitat quality 2: Marginally suitable – expected to occur rarely and only temporarily. Breeding not expected to occur. Contains some known habitat elements, but these are either sparsely present or of very poor quality or too dense to support foraging activity.
 - Habitat quality 3: Moderately suitable/suboptimal – expected to occur at times. May not support resident populations and breeding may not occur; unlikely to provide core or refugial habitat. Habitat contains some characteristics described for the species, but the quality is compromised / missing key habitat characteristics, e.g. required cover or openness, dense bushes, only minor presence of key habitat species, has impacts from grazing / poor environmental conditions (at time of assessment), weeds present, predation by introduced predators.
 - Habitat quality 4: Suitable habitat – expected to occur. Habitat contains key elements and within the known vegetation cover range recorded for the species, but either of a lower quality or

without known records for the area. Breeding possibly occurs in such habitat if the species present but may not represent a refugial area.

- Habitat quality 5: Very suitable – either observed/detected, or there are known records for the area or contains the highest quality habitat for the species. Where the key characteristics and flora species are present, breeding is expected to occur and possibly provide refugial habitat during poor environmental conditions.

The locations of fauna survey sites (BS = Bird Survey, SM = Song Meter, OP = Opportunistic) are provided on Figure 3.6.

Field assessments were conducted under the following permits:

- Lathwida Statewide Fauna, U27341-1, expires 26/09/2024
- Lathwida Statewide Vegetation, Bull_U27347-1, expires 28/09/2024.

A summary of survey effort, habitat type and time is provided in Section 3.

Song Meters

Song Meters (SM) were deployed in suitable habitat areas. Given core optimal habitats were not present (i.e. drainage lines with dense Black Bluebush and spiny shrubs, SM were deployed in the most suitable habitat available. Table 3.12 in Section 3.5 summarises deployment location and habitat type.

Four Song Meter SM4s were deployed at four survey sites for one night from 6 to 7 December 2023, primarily to detect the potential presence of Western Grasswren (*Amytornis textilis myall*) but also to characterise the avian fauna within the survey area. Each Song Meter was set to record for 14 hours over a 24-hour period. The recording schedule was set as follows:

- 25 minutes recording and 5 minutes not recording starting at 04:00 and finishing at 10:00 (five hours per 24 hours)
- 30 minutes recording and 30 minutes not recording starting at 10:00 and finishing at 03:30 (nine hours per 24 hours).

This schedule was also used for Survey Three 28 to 30 August 2024. Survey Three – four Song Meters were also deployed at four survey sites for three nights between 28 to 30 August 2024, primarily to detect to potential presence of Western Grasswren (refer Table 3.12 for further detail).

Analysis of bird diversity

Song Meter recordings were also analysed to identify non-target species to compile species lists for each site. Species identified were recorded as a presence and calls were compared to reference audio files of bird calls where required. Species diversity is likely to be underrepresented due to excessive wind, traffic and industrial noise which is likely to have masked many calls. Song Meter deployment was also limited to one night rather than a typical deployment of at least four nights.

Further detail about Song Meters and Kaleidoscope Cluster Analysis for Western Grasswren is provided in Appendix C.

2.2.2 Malleefowl

An additional survey was undertaken (Survey Two) to search for evidence of Malleefowl presence within vegetation mapped as Mallee along Port Bonython Road. Two ecologists (one NVC Accredited) conducted a foot traverse within the proposed pipeline temporary Disturbance Footprint area mapped as mallee between 10 to 12 March 2024.

The national survey guidelines for Australia's threatened birds (DEWHA 2010) suggest the following search effort for Malleefowl detection should include:

- area searches in suitable habitat for active mounds (used for nesting), tracks/footprints and sightings of birds
- transect surveys in sandy areas for detection of Malleefowl footprints
- ten-person hours minimum per 50 ha.

Malleefowl are sedentary and remain in the same area throughout the year. Egg-laying usually starts in September and can continue to early autumn. Chicks usually emerge from the nesting mound in November but may continue until March (DEWHA 2010). Based on this, if Malleefowl were present within the proposed Disturbance Footprint, evidence of a nesting mound, with or without remains of hatched eggs would be expected in March, hence the timing of the survey is considered suitable.

Additional BAM surveys were also undertaken within the project Disturbance Footprint, initially mapped as Mallee, to update mapping, inform impact assessment and provide baseline information for future vegetation clearance approvals.

Survey Three (28-30 August 2024) also included additional survey effort, although access to the updated Disturbance Footprint on the former Defence land was not available. Two ecologists conducted a slow drive by along the transect and collected Vegetation Checkpoints (including photos) to confirm the vegetation in the mapping of the updated Disturbance Footprint. A high-level visual search for conspicuous Malleefowl mounds in proximity to the old DoD fence line was also conducted (refer Figure 3.7 for Malleefowl transect).

Additional survey effort included desktop analysis of LiDAR (Light Detection and Ranging) data. LiDAR survey data is acquired from sensors mounted on light aircrafts or drones, followed by on-ground inspections of possible mounds (Hossain et al. 2022; Parvin et al. 2021; Sackmann and Jamieson 2018; Saffer and Peake 2014). In comparison to aerial photography, LiDAR can monitor the ground below canopy and can therefore be used to detect the characteristic shapes of Malleefowl mounds even in dense vegetation with a reported accuracy of 55-97% of possible mounds being actual Malleefowl mounds (Hossain et al. 2022; Parvin et al. 2021; Sackmann and Jamieson 2018; Saffer and Peake 2014). LiDAR data was provided by Infrastructure SA for the locality (ISA 2024). This data was reviewed against vegetation mapping and high-resolution aerial imagery where potential mounds were classified into one of four categories; not a mound, unlikely, possible and likely. These were subsequently ground-truthed in the field.

2.3 Survey site coordinates

The coordinates of the vegetation assessments (BAM), Song Meter locations (SM) and Bird Surveys (BS) are provided in Table 2.1.

Table 2.1: Lathwida survey site coordinates within the PSL Area

Site Type	Site Name	Easting	Northing
BAM	LEEP1	746396	6354850
BAM / SM / BS	LEEP2 / LESM03	741752	6348397
BAM / SM / BS	LEEP3 / LESM04	741266	6349136
BAM / SM / BS	LEEP4 / LESM01	742565	6349797
BAM	LEEP5	750436	6351360
BAM	LEEP6 / LESM02	742104	6348680
BAM	LEEP7	753538	753538
BAM	LEEP8	751864	751864
BAM	LEEP9	747509	747509
BAM	LEEP10	748404	748404
BAM	LEEP11	749233	749233
BAM	LEEP12	750076	750076
BAM	LEEP13	753935	6350101
BAM	LEEP14	756412	6348148
BAM / SM / BS	LEEP15 / LESM06	746122	6355484
BAM	LEEP16	745265	6354626
SM / BS	LESM05 / BS	745238	6354928
SM / BS	LESM07 / BS	755800	6350656
SM / BS	LESM08 / BS	754913	6350378

BAM = Bushland Assessment Method, SM = Song Meter, BS = Bird Survey

2.4 Survey limitations

Weather conditions during Survey One and Two were only partially ideal for bird detection with very hot temperatures, humidity and heavy winds (although consistent with coastal location). Noting that the key aim of the survey was habitat and vegetation mapping, along with Song Meter placement in suitable Western Grasswren habitat, and this was achieved.

For Survey One there was excessive background noise in the Song Meter recordings due to high winds, industrial noise from the adjacent steel works, rail activity on the adjacent rail line and heavy traffic adjacent to site LESM4. This compromised some of the recordings to the point that they provided no useable data. In addition, Western Grasswren has a high-pitched call in the same range as the calls of common birds such as White-winged Fairywren, Purple-backed Fairywren and Splendid Fairywren, hence some similar calls were difficult to separate, and many calls could not be identified to species level. However, all of the common fairywren species have characteristic calls which can be separated from the easily recognisable Western Grasswren song call (confirmed at three of four sites). Such a large recording effort (75 hours) required additional analysis using the automated vocalisation detection clustering function of Kaleidoscope. Therefore, not all detections were manually verified (listened to), only those clusters that were close to the Kaleidoscope bait clusters (refer Appendix C), and only a limited number of sample files from other clusters were manually listened to due to time constraints.

For Survey Three, no data was collected on three of four Song Meters. Song Meter 06 collected a total of 37 hours, of which 20 hours were between 5 and 10 am, Western Grasswren were detected on least 3 to 4 recordings. Bird Surveys were also conducted at each Song Meter site, particularly when conditions were optimal in the mornings. Conditions were generally cool, calm during most Bird Surveys, but there were some periods with moderate winds (when survey effort time was reduced to a minimum of 20 minutes).

2.5 Likelihood of occurrence assessment

A likelihood of occurrence assessment was undertaken for the threatened flora and fauna species, ecological communities and migratory species highlighted in the EPBC PMST output as potentially occurring within the Study Area (PSL Area and 5 km buffer). Findings of the desktop assessment (previous records) and any field survey results (e.g. species observations, vegetation/habitat mapping) were used to determine the likelihood of occurrence status (does not occur, unlikely, potential, likely or known) for each of the highlighted species or communities that may occur in the Study Area. The likelihood criteria are provided in Table 2.2.



Table 2.2: Likelihood of Occurrence Criteria

Likelihood of Occurrence	Definition
Does not occur	<p>No recent (1995 or more recent) or historic records (older than 1995) of the species within 5 km of the PSL Area.</p> <p>No suitable habitat for the species within the PSL Area.</p> <p>Mapped species distribution does not overlap with the PSL Area.</p>
Unlikely	<p>No recent records (1995 or more recent) of the species in the PSL Area, or in surrounding areas.</p> <p>No historic records (older than 1995) of the species in the PSL Area, but historic records exist within surrounding areas.</p> <p>No suitable habitat for the species in the PSL Area, or suitable habitat which is present is highly disturbed or degraded.</p> <p>Project Area is on the fringe of the mapped species distribution and the distribution only potentially overlaps with the PSL Area.</p>
Potential	<p>No recent records (1995 or more recent) of the species in the PSL Area, or in surrounding areas.</p> <p>No historic records (older than 1995) of the species in the PSL Area, but historic records exist within surrounding areas / adjacent habitats.</p> <p>Suitable habitat for the species exists in the PSL Area.</p> <p>Project Area is within the mapped species distribution.</p>
Likely	<p>No recent records (1995 or more recent) of the species in the PSL Area, however there are recent records within 5 km of the PSL Area.</p> <p>Historic records (older than 1995) may exist in the PSL Area and/or in surrounding area.</p> <p>Important habitat for the species (for foraging or breeding) is present in moderate to good condition within the PSL Area.</p> <p>Known species distribution overlaps with the PSL Area.</p>
Known	<p>Species has been recently (1995 or more recent) recorded in the PSL Area.</p> <p>The species has specific habitat requirements and these are known to be present within the Project Area.</p> <p>Species has been recorded in nearby habitat that is contiguous with the PSL Area.</p> <p>Species has been recorded on site (e.g. recent surveys).</p> <p>Important habitat for the species (for foraging or breeding) is present within the Project Area.</p> <p>Known species distribution overlaps with the Project Area.</p>

3 Results

3.1 Desktop Review

Previous vegetation assessments (Bushland Assessment Methodology BAM)), vegetation mapping point collection, Bird surveys and Song Meter deployment have been undertaken within the Study Area as part of the Northern Water and HJP projects (refer Table 3.1). Some survey sites for these studies are shown on Figure 3.1. A number of these sites align with, the PSL Area and Project Area, which allows extrapolation for the WHP, using a combination of recent mapping (Jacobs 2023a), site validation (this survey) and aerial imagery. For example, areas east of Whyalla CP surrounding the salt pans are mapped as Acacia Shrubland or Chenopod Shrubland and likely represent habitat which is likely suitable for Western Grasswren. This was confirmed during the recent Lathwida survey and Song Meter deployment – refer Section 3.4. Similarly, extrapolation from Jacobs surveys undertaken for HJP Zone 3 can be used to update vegetation mapping when combined with recent (December 2023, March 2024 Lathwida survey results (Lathwida 2024b)).

There have been previous surveys along the western end of the Study Area (e.g. immediately south of Whyalla CP / west of Lincoln Highway) (Figure 3.1). This area was surveyed as part of the HJP project (Jacobs 2023a, 2023b). Western Grasswren were detected to the south in vegetation contiguous with Whyalla CP (where Western Grasswren are also known to occur) and are they are known from vegetation Heritage Area (HA) 1588. Similarly, more recent surveys conducted as part of the HJP (EBS 2023) and proposed solar farms in the PSL Area, also detected Western Grasswren. Minimal surveys have been conducted in the land that was previously owned by DoD (Port Bonython end of PSL Area), primarily due to access issues and risk of Unexploded Ordinance (UXO) (Figure 3.1).

There are areas of vegetation mapped as Mallee east of the saltpans and small patches closer to Port Bonython (DEW 2024) and DEW Staff have suggested Malleefowl may also occur there (DEW pers. comm. 2023). Along Port Bonython Road, north of the salt pans, there are records for Malleefowl (from 1999, crossing the road and foraging) (BDBSA 2023). There are also records for several migratory and EPBC listed shorebirds around the saltmarsh / Whyalla artificial evaporation salt pans (BDBSA 2023, Birdlife Australia 2023).

Table 3.1: Summary of existing studies and field surveys relevant to the PSL Area

Report	Target Area	Assessment
Jacobs (2023a)	Port Bonython via Port Bonython / Point Lowly Road and Lincoln highway	Desktop and preliminary field assessments of the proposed Hydrogen Hub at Port Bonython and areas of land south of Whyalla Conservation Park (CP)/west of Lincoln Highway. The studies included preliminary likelihood assessments, draft vegetation mapping, bird surveys, Song Meter deployment and Bushland Assessment Methodology (BAM) (vegetation assessments). Six broad vegetation communities were mapped. No EPBC listed species were detected (at Port Bonython). The potential saltmarsh TEC is discussed given stranded saltmarsh occurs adjacent Port Bonython Road. Species considered likely or known to occur in the Project Area include Malleefowl (records along Port Bonython Road in mallee habitat) and Western Grasswren (potential to occur in taller chenopod shrubland / myall woodlands) nearer Lincoln Highway. A number of coastal/shorebirds are considered to have potential to occur in adjacent areas (e.g. saltmarsh and Whyalla Saltfields).
Jacobs (2023b)	Hydrogen Jobs Plan Site 1	Desktop and field assessments of the proposed HJP 'site 1'. Several field assessments included Song Meter deployment, bird survey, BAM assessments and updates to habitat mapping. Ecological constraints were considered including known areas of high quality habitat for the Western Grasswren, and suggestions that proposed infrastructure should be placed in areas of Pearl Bluebush (<i>Maireana sedifolia</i>) low shrubland and east of the water tanks in areas of existing disturbance and infrastructure. The study also suggests avoiding impacts to treed areas that will take longer to rehabilitate and will provide habitat for Western Grasswren as well as Southern Whiteface.
Jacobs (2023c) cited in Infrastructure SA (2024)	Norther Water Project	Desktop and several field assessments for Northern Water Project, including vegetation assessments (BAM and RAM) and mapping and targeted Western Grasswren surveys, Song Meter deployment and opportunistic detection of Southern Whiteface (prior to listing). Surveys occurred concurrently or separately from HJP surveys and included relevant areas adjacent the PSL Area (e.g. along Port Bonython Road, north of PSL Area in Department of Defence land, along Lincoln highway).
EBS (2023)	Hydrogen Jobs Plan Site 1 / Area east of Lincoln Highway north and south of Port Bonython Road	A targeted Western Grasswren survey in October 2023. Call playback methods were used at 24 sites. Nine of the sites were located adjacent Lincoln Highway north and south of Port Bonython Road and align within the PSL Area. Western Grasswren were detected at three of these sites; two were north of Port Bonython Road, one was south of Port Bonython Road, immediately adjacent the Lincoln Highway and near the southern extent of the PSL Area (e.g. south of proposed solar farm). Another eight sites were within the PSL Area that is part of 'HJP Site 1' and is west of the Lincoln Highway. Western Grasswren were detected at four of these sites. EBS (2023) suggested the majority of habitat within their Study Area was suitable for Western Grasswren, including areas mapped as: Chenopod open shrublands +/- emergent trees, low open woodlands of Western Myall with a Chenopod shrub understorey and low open woodlands with Western Myall and Black Oak over Chenopod shrub understorey. One degraded area of Western Myall over Chenopod was not considered suitable given the presence of multiple existing tracks, highly disturbed soil and a borrow pit.

3.2 Gap Analysis

A gap analysis was undertaken following a review of available background information for the Study Area. The gap analysis recommended the following assessments to determine the extent of potential impact to threatened species.

- In-field vegetation assessment to:
 - Describe and ground-truth the type and condition of vegetation at the western end of the PSL Area (east of Lincoln Highway) where the Whyalla lateral pipeline currently runs past the Whyalla Salt Evaporation Pans. Areas north of Point Bonython Road have been extrapolated from Jacobs 2023 mapping and State vegetation mapping (DEW 2024). However, additional drive by surveys along the Whyalla lateral (eastern end of the PSL Area) should also be conducted, as Jacobs (2023a) mapping has been extrapolated in this area and UXO risk has prevented access along the lateral.
 - Rule out presence of *Swainsona pyrophila* in mallee areas and areas that have been highly disturbed, if mallee areas cannot be avoided.
 - Rule out presence of *Tecticornia flabelliformis* in samphire areas adjacent Whyalla Salt Pans, if these areas receive any inundation and cannot be avoided. The species is most easily detected in Summer.
 - Describe vegetation at the western end of the PSL Area (east of Lincoln Highway) in terms of habitat suitability for Western Grasswren, Southern Whiteface and Blue-winged Parrot. Noting that given Western Grasswren and Southern Whiteface have multiple records in Whyalla CP and near Lincoln Highway, they would be considered as known / likely in the western end of the PSL Area unless the vegetation condition is very poor.
- In-field fauna assessment:
 - It is considered that suitable effort has been undertaken along Lincoln Highway and near Port Bonython Road, based on the Project Area at the time of reporting. If alternate locations are considered, additional bird surveys may be required.
 - Targeted bird surveys are not required, but target habitat assessments and opportunistic bird survey would build on the information currently available to conduct a significant impact assessment.

3.3 Existing environment

3.3.1 Land use

The PSL Area spans from approximately 4 km north of Whyalla east to Port Bonython / Point Lowly, approximately 18 km NE of Whyalla, SA. The proposed buried loop pipeline corridor runs from north of Whyalla to approximately 4 kilometres from Port Bonython (approximately 22 km long). The PSL Area is approximately 7,233 ha, based on the polygon provided by EPIC Energy as per Figure 1.2.

The PSL Area and majority of the proposed pipeline occur within an area and surrounded by land use described as conservation and natural environments (residual native cover) and intensive uses (road). The eastern extent of the Study Area is adjacent land classified as intensive use for manufacturing and industrial. Some of this land was historically used by the DoD and has a risk of UXO (signs are present along fence lines north and south of Port Bonython Road, and along Fitzgerald Bay Road). There is also land more recently used by DoD adjacent (but not within) the northeastern end of the PSL Area, artificial saltpans and stranded saltmarsh are south of the centre of the PSL Area and Whyalla CP is adjacent the western extent of the PSL Area. The Tregalana pastoral lease (grazing) occurs northwest of the PSL Area and includes areas of native vegetation. It is understood there are also two proposed solar farms in the western end of the PSL Area (east of Lincoln Highway). The HJP project is located at the western end of the PSL Area west of Lincoln Highway.

It is noted that the artificial saltpans adjacent the PSL Area to the south / southeast are listed as known shorebird habitat in the National Directory of Important Migratory Shorebird Habitat (Weller et al. 2020) and a Coastal Wader Bird and Seabird site (DEW 2024). The saltpans and stranded saltmarsh are also part of an area defined as a Wetland of National Importance. The Upper Spencer Gulf (wetland # SA020) which is an inverse estuary containing shallow, warm saline waters and includes intertidal mangrove forests, tidal sand and mudflats and adjacent seagrass meadows. Shorebirds (both migratory and resident) are known to visit the area. Neophema parrots (including the Orange-bellied Parrot (*N. chrysogaster*) and Blue-winged Parrot (*N. chrysostoma*) have historically (1992) been recorded at the mangrove creeks (Morelli 1995).

3.3.2 Bioregion

The Interim Biogeographic Regionalisation for Australia (IBRA) describes land for conservation under Australia's Strategy for the National Reserve System (Thackway and Creswell 1995). The IBRA classifies Australia into 89 bioregions and 419 subregions (DCCEE 2023a). Each bioregion is a distinct area characterised by geology, landform patterns, climate, ecological features, and plant and animal communities. Broadly, the Study Area occurs across a single IBRA Region, Gawler (GAW) and two IBRA Subregions, Arcoona Plateau and Myall Plains (refer Table 3.2). Further subdivisions within these subregions, in terms of vegetation and other landscape context factors are used in calculating offset areas for clearance approved under the NV Act. For example, the section of Myall Plains Subregion within the PSL Area aligns with IBRA Vegetation Association Tregolana (western end) and Simmens and the Arcoona Plateau Subregion aligns with Simmens (eastern end).

Table 3.2: IBRA Bioregion / Subregion summary

IBRA Classification	Key Description
Gawler Region	<p>The whole PSL Area occurs in the IBRA Bioregion, characterised by semi-arid to arid flat topped to rounded hills, rocky quartzite hills, sandstone plateaus, depositional plains, gibber plains and salt-encrusted lake beds. Typical vegetation includes open woodlands of Black Oak (<i>Casuarina pauper</i>) and Western Myall (<i>Acacia papyrocarpa</i>), open mallee scrub, chenopod shrublands (bluebush / saltbush) and tall Mulga (<i>Acacia spp.</i>) shrublands. The native vegetation across the area is generally relatively intact, but in some areas, particularly near stock watering points, it is highly disturbed.</p> <p>The environment of the region has been influenced by pastoral activities and infrastructure (e.g. sheep and cattle stations) and mining operations, as well as the construction and operation activities of the Woomera Rocket Range. Grazing by livestock and rabbits has led to extensive habitat modification across the region and coupled with the introduction of predators such as foxes and cats, has resulted in the extinction of many small to medium sized mammals. Weeds are present in the region, primarily in disturbed areas.</p>
Arcoona Plateau Subregion	<p>The eastern end of the PSL Area occurs in this IBRA Subregion, which is dominated by treeless low stony hills with the clay soils supporting chenopod and samphire low open shrubland and creek lines with open woodlands and taller shrublands. Inland saline depressions occur in small patches. Stony low hills and depressions with cracking clays and gilgai formations provide potential habitat for Nationally Vulnerable Plains Mouse. Broad vegetation communities include:</p> <ul style="list-style-type: none"> • Stony low hills with cracking clay soils supporting Bladder Saltbush (<i>Atriplex vesicaria</i>)/Samphire (<i>Tecticornia medullosa</i>) and Low Bluebush (<i>Maireana astrotricha</i>) low open shrubland; • Minor drainage lines with Western Myall and Black Oak woodlands with tall open shrublands of emubush (<i>Eremophila spp.</i>) and wattle (<i>Acacia spp.</i>); • Major drainage lines with Northern River Red Gum (<i>Eucalyptus camaldulensis ssp. arida</i>) open woodland; • Run-on clay depressions and deeper gilgais with Swamp Cane-grass (<i>Eragrostis australasica</i>) tall grassland. <p>Within the PSL Area this aligns with the Simmens IBRA Vegetation Association.</p>
Myall Plains Subregion	<p>The majority of the PSL Area occurs in this IBRA Subregion, characterised by vast plains of chenopod shrubland with emergent trees tending to lower chenopod shrublands in coastal areas and a narrow coastal strip with samphire low open shrubland encroaching on tidal areas and mangrove forests in tidal areas. Supports mixed open woodlands of Western Myall, Black Oak and False (<i>Myoporum platycarpum</i>) Sandalwood and smaller patches of mallee on plains and low sand dunes.</p> <p>Particular vegetation communities provide the predominant habitat for Nationally Vulnerable Western Grasswren. Some Mallee communities also provide habitat for Nationally Vulnerable Malleefowl. Broad vegetation communities include:</p> <ul style="list-style-type: none"> • Sandy loam plains with Western Myall / False Sandalwood / Black Oak low open woodland over chenopod low open shrubland (some communities with taller spiny shrubs and / or with Black Bluebush (<i>Maireana pyramidata</i>) providing habitat to Western Grasswren.; Chenopod shrublands of Black Bluebush), Pearl Bluebush (<i>M. sedifolia</i>) and Bladder Saltbush with emergent trees (some communities with taller spiny shrubs providing habitat to Western Grasswren) • Low dunes and sand plains with Red Mallee (<i>Eucalyptus oleosa</i>) / White Mallee (<i>E. gracilis</i>) / Summer Red Mallee (<i>E. socialis</i>) open mallee over chenopod shrubs with and without spinifex (<i>Triodia spp.</i>) (some communities providing habitat to Malleefowl). • Low open chenopod shrublands of Pearl Bluebush, Bladder Saltbush and <i>T. medullosa</i> in coastal areas or in small patches on tableland landforms. • Saline clay plains subject to tidal inundation with <i>Tecticornia spp.</i> low open shrubland (some areas may represent EPBC listed Coastal Saltmarsh) • Low coastal dunes and sandplains with Coastal Daisy (<i>Olearia axillaris</i> / Sea Box (<i>Alyxia buxifolia</i>) open shrubland • Tidal channels with Grey Mangrove (<i>Avicennia marina ssp. marina</i>) tall shrubland (minor occurrences). <p>Within the PSL Area this aligns with the Tregolana and Simmens IBRA Vegetation Association.</p>

3.3.3 Vegetation

The majority of the PSL Area and surrounds is mapped as remnant native vegetation based on the DEW vegetation mapping layers (Native Vegetation Cover, SA Vegetation, Coastal Saltmarsh and Mangrove Mapping, DEW 2024 (Figure 3.2). Vegetation has also been mapped following previous field surveys by Jacobs (2023a, 2023b, and 2023c) (Figure 3.3) and updated by Lathwida (2024a, 2024b) (presented in Section 3.4 and Figure 3.5). The following major vegetation groups are mapped as occurring across the broader Study Area (DEW 2024, Figure 3.2, Figure 3.3):

- Chenopod Shrubland (eastern end and sections of the western end of PSL Area)
 - Broadly comprises Pearl Bluebush (*Maireana sedifolia*) mid sparse shrubland over Ruby Saltbush (*Enchylaena tomentosa* var. *tomentosa*), Thorny Saltbush (*Rhagodia spinescens*), speargrass, (*Austrostipa* sp.) and mixed shrubs. Jacobs 2023a confirmed this vegetation was generally present at the eastern end of the PSL Area (defined as Broad Community 1, 2, 3,4 in Jacobs 2023b, Figure 3.3). This mapping has also been confirmed and updated following the recent Lathwida survey (refer Section 3.4).
- Eucalyptus Mallee Forest and Mallee Woodland (areas adjacent the centre of the PSL Area, along Port Bonython Road and pockets in the southeast of the PSL Area)
 - Broadly comprises Yorell (*Eucalyptus gracilis*), +/- White Mallee (*E. dumosa*) +/- Gilja (*E. brachycalyx*), +/- Red Mallee (*E. oleosa* ssp. *ampliata*) mid open mallee forest over Sheep Bush (*Geijera linearifolia*), Dryland Teatree (*Melaleuca lanceolata*) shrubs over Ward's Weed - exotic (*Carrichtera annua*), speargrass, emubush, Mealy Saltbush (*Rhagodia parabolica*), Ruby Saltbush, Grey Bindyi (*Sclerolaena diacantha*) shrubs. Jacobs (2023a) confirmed this vegetation was generally present along Port Bonython Road and in patches at the eastern end of the PSL Area (defined as Broad Community 9 and 10 in Figure 3.3). This mapping has also been confirmed and updated following recent Lathwida survey (refer Section 3.4). Note there is some regrowth mallee / acacia shrubland included in this mapping, in road reserve areas along Port Bonython Road and adjacent samphire north of Port Bonython Road.
- Acacia Woodland (western end of the PSL Area)
 - Broadly comprises Western Myall low woodland over Bladder Saltbush, Pearl Bluebush, Ruby Saltbush and Intricate Saltbush (*Rhagodia ulicina*) low shrubs. Noting that these woodlands also include several other tree species in scattered patches/pockets including Black Oak, False Sandalwood and Bullock Bush. Jacobs (2023a) confirmed this vegetation was broadly present (defined as Broad Community 5, 6, 7, 8, 10 in Figure 3.3). This mapping has also been confirmed and updated following recent Lathwida survey (refer Section 3.4).

- Casuarina Woodland (small pockets at the western end along existing pipeline)
 - Broadly comprises Black Oak low woodland over Sheep Bush, Spiny Fanflower (*Scaevola spinescens*) tall shrubs over Ruby Saltbush, Balcarra Grass (*Austrostipa nitida*), +/- Silver Mulla Mulla (*Ptilotus obovatus* var. *obovatus*), +/- Pearl Bluebush, +/- Bitter Saltbush (*Atriplex stipitata*) low shrubs over Ward's Weed – exotic. Jacobs (2023a) confirmed this vegetation was present, at the western end of the PSL Area (defined as Broad Community 8 in Figure 3.3). This mapping has also been confirmed and updated following recent Lathwida survey (refer Section 3.4), noting that pockets of this vegetation occur east of the Lincoln Highway, where the communities have been combined to represent the on-ground scenario (i.e. within Acacia Woodlands).
- Melaleuca Shrubland (centre of the PSL Area, south of Port Bonython Road)
 - Dryland Tea-tree, Sheep Bush +/- Native Apricot (*Pittosporum angustifolium*) +/- Native Cherry (*Exocarpos aphyllus*) mid open shrubland over +/- Marsh Saltbush (*Atriplex paludosa* ssp. *cordata*, +/- Fleshy Saltbush (*Rhagodia crassifolia*) +/- Bladder Saltbush low shrubs over +/- Native Pigface (*Carpobrotus rossii*), +/- Bonefruit (*Threlkeldia diffusa*) +/- Small-leaf Sea-heath *Frankenia sessilis*. Jacobs (2023a) have not confirmed presence of this vegetation community however this may occur in areas that have not yet been surveyed, or are covered by existing infrastructure. This vegetation was also not detected during the Lathwida survey.
- Samphire Shrubland (near salt evaporation pans centre of PSL Area,)
 - Brown-head Samphire (*Tecticornia indica* ssp.), +/- Saltbush (*Maireana oppositifolia*), +/- Marsh Saltbush, +/- Bladder Saltbush low open shrubland over +/- Native Pigface. Jacobs (2023a) have confirmed the presence of this community (but did not undertake detailed surveys within this vegetation type). The recent Lathwida survey confirmed the presence of this vegetation, defined as Broad Community 14 in Figure 3.3).
 - Described as 'stranded samphire' zone, this vegetation does not qualify as a TEC (refer Section 3.3). This vegetation is associated with the edges of the Whyalla Saltfields and inland from False Bay beach areas east and south of the PSL Area. It is noted that the Whyalla Saltfields/Saltworks/Evaporation Pans are documented as a known Coastal Wader Bird and Seabird site (DEW 2024) (refer Section 3.4).

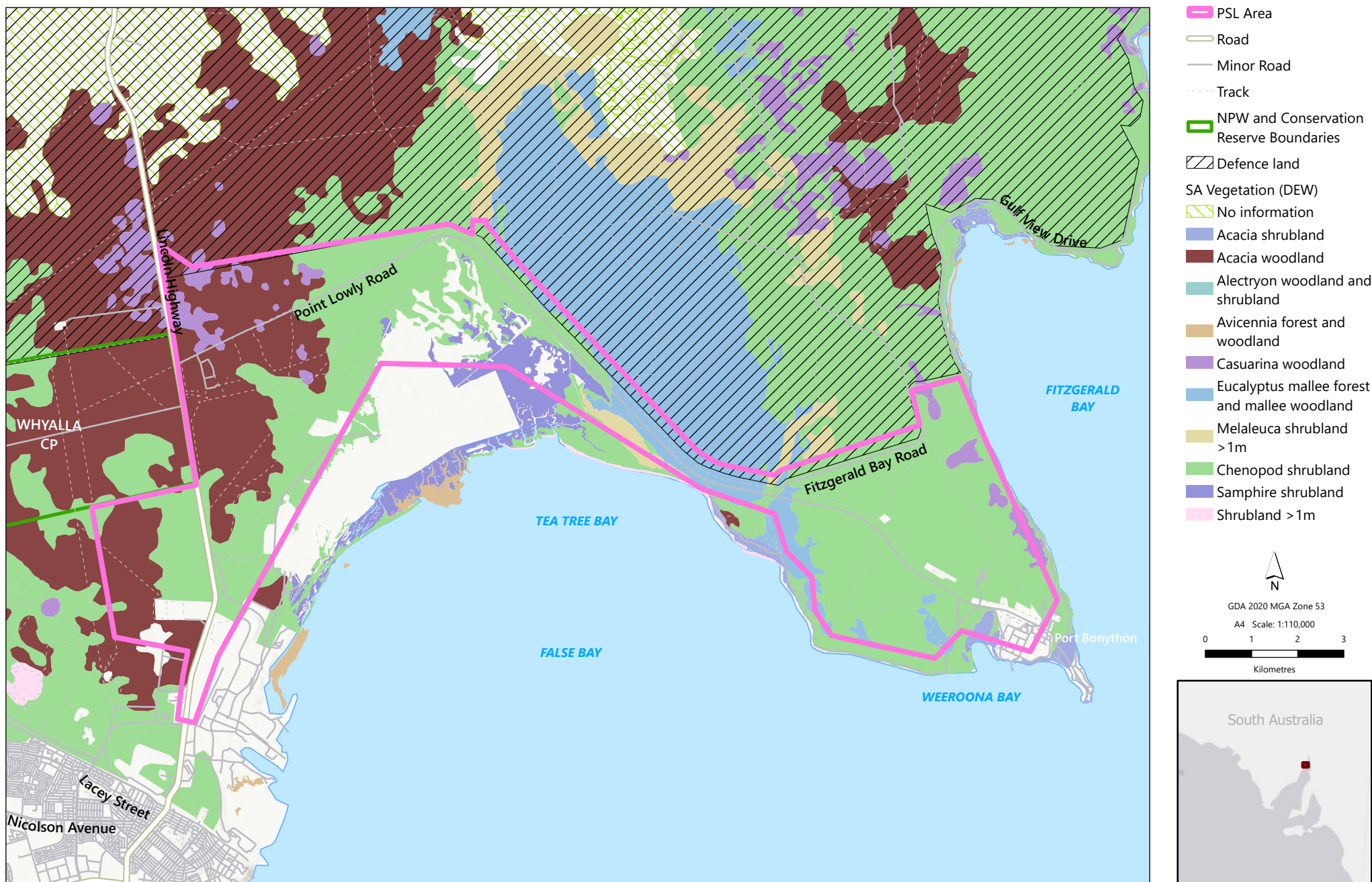


Figure 3.2: Study Area major vegetation groups (SA Veg layer)

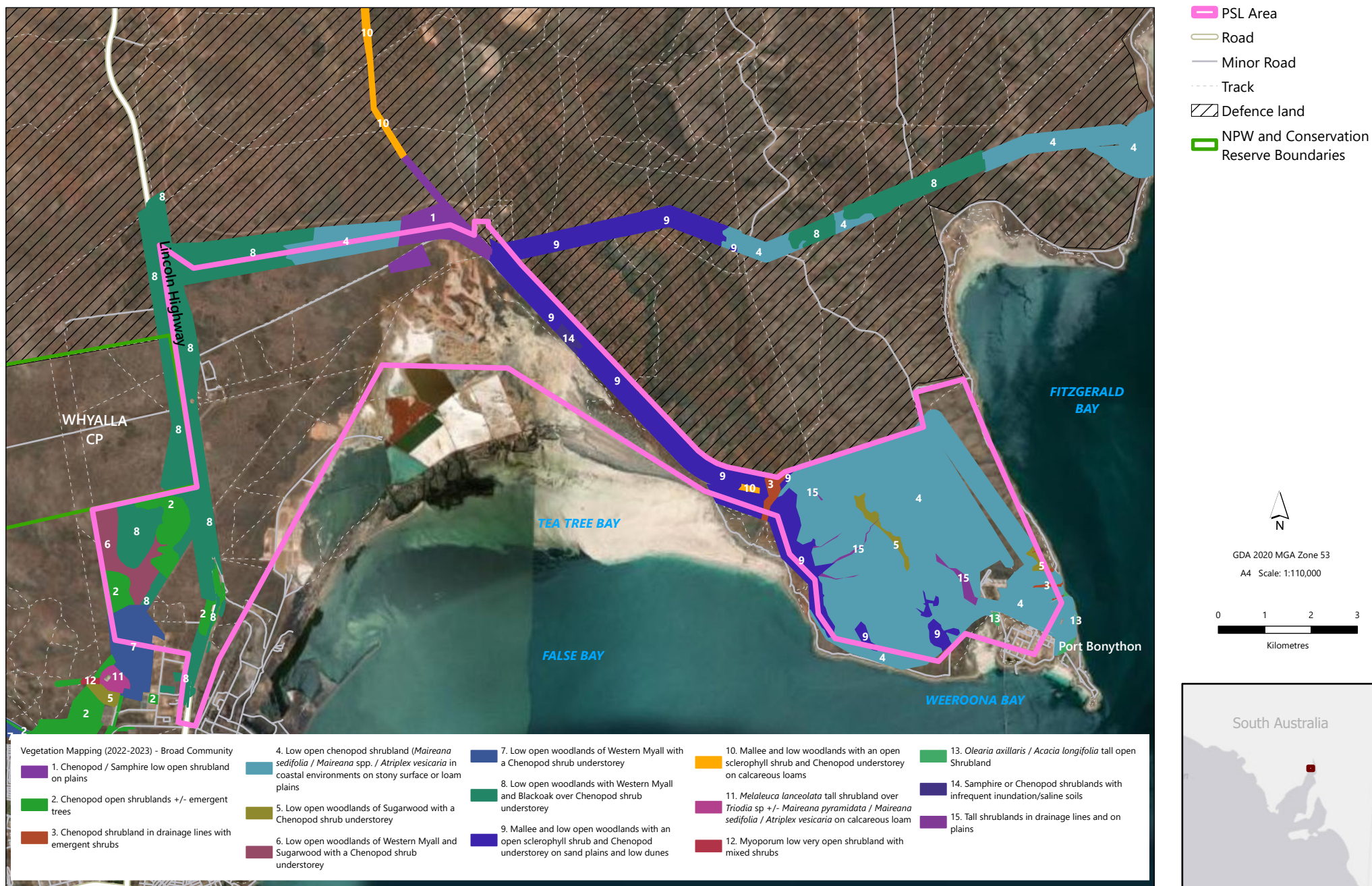


Figure 3.3: Study Area preliminary vegetation communities (Jacobs 2022/2023)

3.3.4 Exotic species

There are existing records in the Study Area for exotic flora (20) and fauna (11) species and these are summarised in Table 3.3 and Table 3.4. Nineteen of the flora species are Declared under the LSA Act and seven of these are also Weeds of National Significance (WoNS).

Table 3.3: Exotic flora species previously recorded in the Study Area (BDBSA 2023)

Common Name	Scientific Name	Status ¹	Records within Study Area
Khaki Weed	<i>Alternanthera pungens</i>	Declared	3 (1971, 1985) ²
Buffel Grass	<i>Cenchrus ciliaris</i>	Declared	15 (2011-2018). Previous surveys have highlighted the presence of Buffel Grass along Port Bonython Road (Infrastructure SA 2024).
Fountain Grass	<i>Cenchrus setaceus</i>	Declared	1 (2014)
Devil's Rope Pear	<i>Cylindropuntia imbricata</i>	Declared WoNS	1 (1996)
Coastal Cholla (cactus)	<i>Cylindropuntia prolifera</i>	Declared WoNS	15 (2007, 2018)
Lincoln Weed	<i>Diploaxis tenuifolia</i>	Declared	6 (2002) ²
Salvation Jane	<i>Echium plantagineum</i>	Declared	23 (2002, 2004) ²
False Caper	<i>Euphorbia terracina</i>	Declared	2 (1967, 1992)
Gazania	<i>Gazania linearis</i>	Declared	4 (1996 -2018)
African Boxthorn	<i>Lycium ferocissimum</i>	Declared WoNS	3 (1987-2014)
Horehound	<i>Marrubium vulgare</i>	Declared	13 (1996-2004) ²
Riverina Pear	<i>Opuntia elata</i>	Declared WoNS	1 (2004) ²
Grizzly Bear Cactus	<i>Opuntia polyacantha var. erinacea</i>	Declared WoNS	1 (2004) ²
Erect Prickly Pear	<i>Opuntia stricta</i>	Declared WoNS	2 (1995, 2005)
Carrion-flower	<i>Orbea variegata</i>	Declared	10 (1981-2007)
Jerusalem Thorn	<i>Parkinsonia aculeata</i>	Declared WoNS	1 (2010) ²
Three-corner Jack	<i>Rumex hypogaeus</i>	-	1 (1996) ²
Silver-leaf Nightshade	<i>Solanum elaeagnifolium</i>	Declared WoNS	2 (1990) ²
Caltrop	<i>Tribulus terrestris</i>	Declared	1 (1981) ²
Bathurst Burr	<i>Xanthium spinosum</i>	Declared	1 (1996)

¹Declared under Landscape Act; WoNS (Weed of National Significance); ² Some records with low spatial reliability.

Table 3.4: Exotic fauna species previously recorded in the Study Area (BDBSA 2023)

Common Name	Scientific Name	Fauna Type	Records within Study Area
Goat (Feral Goat)	<i>Capra hircus</i>	Mammal	2 (2014, 2016)
Feral Pigeon	<i>Columba livia</i>	Bird	14 (2000–2022) ¹
House Mouse	<i>Mus musculus</i>	Mammal	4 (1981, 1985) ¹
Rabbit (European Rabbit)	<i>Oryctolagus cuniculus</i>	Mammal	1 (2018)
House Sparrow	<i>Passer domesticus domesticus</i>	Bird	35 (1998–2020) ¹
Black Rat (Ship Rat, Roof Rat)	<i>Rattus rattus</i>	Mammal	1 (1979) ²
Common Starling	<i>Sturnus vulgaris vulgaris</i>	Bird	55 (1998–2021) ¹
Common Blackbird	<i>Turdus merula merula</i>	Bird	6 (1998–2022) ¹
Fox (Red Fox)	<i>Vulpes vulpes</i>	Mammal	2 (2017, 2021)
Mallard	<i>Anas platyrhynchos platyrhynchos</i>	Bird	1 (1999)
Muscovy Duck	<i>Cairina moschata</i>	Bird	2 (2017, 2018)

¹Some records with low or no spatial reliability.

3.4 Flora field results

A high-level field assessment of the PSL Area was undertaken 7 to 8 December 2023 (Survey One, BAM sites LEEP1-6). Additional assessments were also undertaken 10 to 12 March 2024 (Survey Two, BAM sites LEEP7-12) and Survey Three (BAM sites 13 -16). The intention of the surveys was to describe the vegetation gaps of the area (given some areas have not been accessed for previous surveys of the PSL Area), deploy Song Meters in potential Western Grasswren habitat (Survey One and Three) or conduct searches for evidence of Malleefowl (Survey Two and Three) in areas that has not been surveyed previously. As per Section 2.2, data was collected for three survey site types; Song Meter, BAM and 'Vegetation Check' to update mapping and inform likelihood assessments, and subsequent significant impact assessment for approvals purposes. Four additional locations with opportunistic weed observations were also noted. Further details are provided below. Full floristic species lists per site are available in Electronic BAM Sheets.

3.4.1 BAM Sites and Vegetation Descriptions

Data for sixteen BAM sites representing five of the six broad vegetation groups is summarised for the PSL Area (Table 3.5, Figure 3.4, and described further below). Data from these sites and 52 'Vegetation Check' sites were used to create an updated vegetation mapping layer for the PSL Area, presented in Figure 3.5.

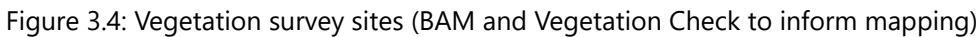
A summary of the BAM statistics including vegetation condition and Unit Biodiversity Scores (UBS), as output by the electronic BAM datasheets is provided for each broad vegetation community. These results include the outputs from Section 3.6. It is noted that further refinement (lowering) of the UBS may be available upon consultation with the Native Vegetation Management Branch, and/or developing a more detailed likelihood assessment to exclude further threatened species from the datasheet. These are based on 1 ha sites within the electronic BAM datasheets and do not include final numbers for Block and area of Disturbance Footprint, given this a baseline assessment.

Table 3.5: Summary of BAM sites established in PSL Area, December 2023 / March 2024 / August 2024

BAM Site	Song Meter	WGW / Malleefowl Habitat	Major Vegetation Group	EP BCM Community	Broad Vegetation Community	Vegetation Association	Unit Biodiversity Score (1 hectare) ¹
LEEP1	NA	NA	Samphire/Saltmarsh	EP13.2	12. Samphire +/- Chenopod shrublands with infrequent inundation/saline soils	Samphire / Mallee Hemichroa low shrubland on saline soils	92.80
LEEP2	LESM3	WGW 3.5	Acacia Woodlands (+/- Black Oak/False Sandalwood/ Bullock Bush)	EP 9.1	6. Low open woodlands of Western Myall over Chenopods	Western Myall over Black Bluebush, Pearl Bluebush and Bladder Saltbush on loamy plains	69.24
LEEP3	LESM4	WGW 3.5	Acacia Woodlands (+/- Black Oak/False Sandalwood/ Bullock Bush)	EP 9.1	7. Low open woodlands of Western Myall +/- Black Oak over Chenopods	Western Myall / Black Oak over Pearl Bluebush, Black Bluebush, Bladder Saltbush shrubland	71.19
LEEP4	LESM1	WGW 2	Chenopod Shrubland	EP 9.2	4. Low Open Chenopod Shrublands	Black Bluebush / Bladder Saltbush low shrubland	60.32
LEEP5	NA	Malleefowl foraging	Mallee	EP 8.1	8. Yorrell / Beaked Red Mallee / Red Mallee with Open Sclerophyll Shrub and Chenopod Understorey	Yorrell / Beaked Red Mallee with sclerophyll over mixed shrubs	76.74
LEEP6	LESM2	WGW 3	Acacia Woodlands (+/- Black Oak/False Sandalwood/ Bullock Bush)	EP 9.1	13. Western Myall low open woodlands +/- Black Oak / Bullock Bush / False Sandalwood over Chenopods	Western Myall +/- Black Oak / Bullock Bush over Black Bluebush / Bladder Saltbush	49.55
LEEP7	NA	Malleefowl foraging	Mallee	EP 8.1	8. Yorrell / Beaked Red Mallee / Red Mallee with Open Sclerophyll Shrub and Chenopod Understorey	Mallee +/- False Sandalwood open woodland over Chenopod shrubland Includes very small area of mixed shrublands in ephemeral drainage lines transition between mallee and chenopod (~1.44 ha of Disturbance Footprint)	62.65
LEEP8	NA	Malleefowl foraging	Mallee	EP 8.1	8. Yorrell / Beaked Red Mallee / Red Mallee with Open Sclerophyll Shrub and Chenopod Understorey	Red Mallee low woodland	64.75
LEEP9	NA	Malleefowl foraging	Acacia Woodlands (+/- Black Oak / False Sandalwood / Bullock Bush)	EP 9.1	6. Low open woodlands of Western Myall over Chenopods	Western Myall tall shrubland (regrowth). <i>Note no longer within the Project Area, now adjacent Project Area</i>	46.03
LEEP10	NA	Malleefowl foraging	Mallee	EP 8.1	8. Yorrell / Beaked Red Mallee / Red Mallee with Open Sclerophyll Shrub and Chenopod Understorey	False Sandalwood +/- Red Mallee over chenopod shrubland	72.6
LEEP11	NA	Malleefowl foraging	Coastal Shrublands	EP 12.2	11. Tall Coastal Shrubland	Tall sclerophyll shrubland on sand	74.94
LEEP12	NA	Malleefowl foraging	Mallee	EP 8.1	8. Yorrell / Beaked Red Mallee / Red Mallee with Open Sclerophyll Shrub and Chenopod Understorey	Open Red Mallee +/- False Sandalwood / Bullock Bush over Bluebush Daisy and Chenopod	75.78
LEEP13	NA	WGW 3	Chenopod Shrubland	EP9.2	4. Low Open Chenopod Shrublands	Pearl Bluebush +/- Black Bluebush low shrubland	79.74
LEEP14	NA	WGW 2	Chenopod Shrubland	EP9.2	4. Low Open Chenopod Shrublands	Spiny Saltbush / Spiny Fanflower +/- Pearl Bluebush low shrubland, +/- very sparse clusters of emergent False Sandalwood. <i>No longer in Project Area.</i>	75.02
LEEP15	SM06	WGW 3	Chenopod Shrubland	EP9.2	4. Low Open Chenopod Shrublands	Bladder Saltbush / Samphire on plains	72.00
LEEP16	NA	WGW 2	Chenopod Shrubland	EP9.2	4. Low Open Chenopod Shrublands	Bladder Saltbush / Thorny Lawrencia low shrubland on sandy saline plains	79.93

EP BCM = Eyre Peninsula Bush Condition Monitoring Manual (Milne, Croft and Pedler 2008); WGW = Western Grasswren (habitat suitability criteria, 2 = marginally suitable, 3 = moderately suitable/suboptimal, 4 = suitable),

¹To finalise Unit Biodiversity Scores email consultation with DEW staff is required to confirm several assumptions of BAM electronic score sheets (e.g. threatened fauna inputs, Block area, cleared perimeter, Disturbance Footprint).



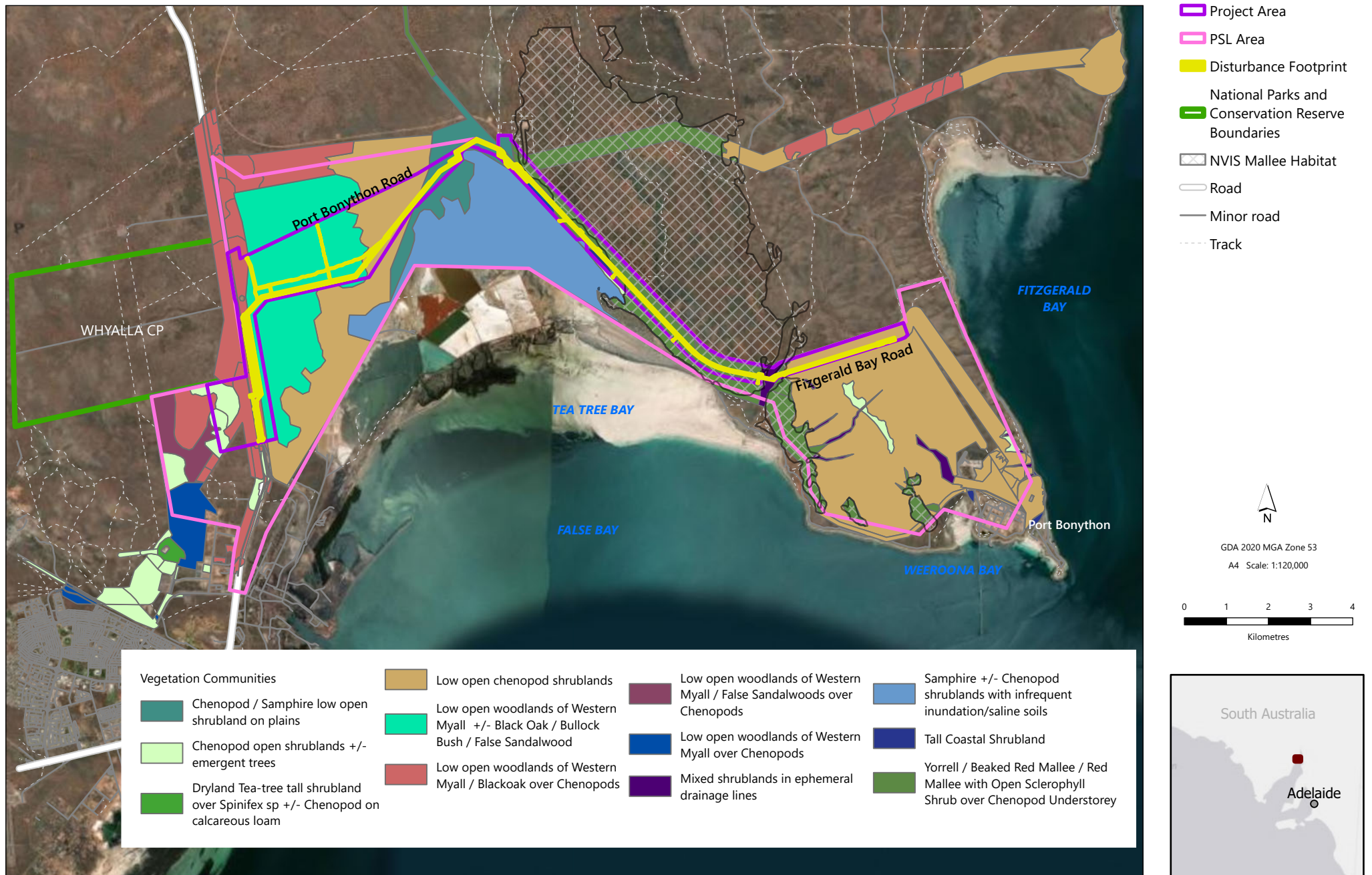


Figure 3.5: Updated PSL Area broad vegetation communities

Samphire +/- Chenopod Shrublands with infrequent inundation / saline soils

BAM site LEEP1 is located in the centre of the PSL Area south of Port Bonython Road adjacent artificial salt pans (refer Figure 3.4). This vegetation aligns with EP BCM 13.2 (Samphire or Chenopod Shrubland with infrequent inundation / saline soils). Anecdotal evidence from local BASF (Badische Anili und Sodafabrik) Whyalla staff suggests some clay pan areas have been quarried and the vegetation is not connected to tidal areas, having been partially disconnected for establishment of the Whyalla Salt Pans / Steelworks. In addition, some vegetation adjacent to and south of this location has been mapped as intact stranded tidal samphire flat (DEW 2024). Whilst this vegetation does not represent the EPBC listed Saltmarsh, it would provide some buffer to areas further south closer to the coast and non-core habitat for migratory and resident shorebirds, particularly following heavy rainfall. Dominant species included Samphire (*Tecticornia halocnemoides* ssp., *T. tenuis*, *T. indica* ssp.), Mallee Hemichroa (*Hemichroa diandra*), and Round-leaf Pigface (*Disphyma crassifolium* ssp. *clavellatum*) (Plate 3.1). With several daisy species (*Brachyscome* sp., *Minuria cunninghamii*) and chenopods (Bladder Saltbush, Pale-fruit Bluebush (*Maireana appressa*) sparsely present. No weeds were detected. Additional photos of the site are provided in Appendix B. A summary of fauna and flora species detected during the assessment are provided in Appendix C and Appendix D, respectively.

Preliminary BAM details for this vegetation community are summarised in Table 3.6.

Table 3.6: Samphire +/- Chenopod Shrublands BAM Summary

BAM Site	EP BCM Community	Landscape context score ¹	Vegetation condition score	Conservation significance score	Unit Biodiversity Score (1 ha) ¹
LEEP1	EP13.2	1.09	77.40	1.10	92.80

¹Landscape context score and UBS to be updated once 'block' and 'cleared perimeter' agreed with NVMB



Plate 3.1: Samphire / Mallee Hemichroa Low Open Shrubland, site LEEP1 (facing north)

Low Open Woodlands of Western Myall +/- Black Oak +/- False Sandalwood over Chenopods

This vegetation community was present at BAM sites LEEP2, LEEP3, LEEP6 and LEEP9 and aligns with benchmark community EP BCM 9.1 (Open Mallee & Low Open Woodlands with a Chenopod Shrub Understorey). These communities are known occur in the lower rainfall areas / top third of the Eyre Peninsula, around Whyalla, extending from Port Augusta through to Western Australia (Milne, Croft and Pedler 2008). BAM site LEEP2 comprised a vegetation association of Western Myall (*Acacia papyrocarpa*) (up to 3 m tall) over Black Bluebush (*Maireana pyramidata*), Bluebush (*M. sedifolia*) and Bladder Saltbush (*Atriplex vesicaria*) on loamy plains (Plate 3.2). Additional shrubs present included Ruby Saltbush (*Enchylaena tomentosa*), Mealy Saltbush (*Rhagodia parabolica*), Desert Goosefoot (*Chenopodium desertorum* ssp.), Senna sp., Hakea (*Hakea leucoptera*). Mistletoe (*Amyema quandang* var. *quandang*) was sparsely present in some Western Myall trees. Exotic species present included Ward's Weed (*Carrichtera annua*) moderately covering many bare areas between low shrubs and Wild Turnip (*Brassica* sp.) were sparsely present. A European Fox (*Vulpes vulpes*) was sighted at this location, and Feral Cat (*Felis catus*) tracks detected.



Song Meter 3 (SM3) (#126520) was deployed at BAM site LEEP2, considered to provide suboptimal habitat for Western Grasswren (rating 3.5). This rating is based on good vegetation structure with a mix of Western Myall trees over low shrubs of Bluebush and Bladder Saltbush, but less Black Bluebush and shrubs that were not too dense. In addition, there was little to no Ward's Weed and open spaces for birds to run between.

During a bird survey there was a probable sighting and audible detection of Western Grasswren during very hot and windy conditions. Additional species observed included; Little Raven, Singing Honeyeater, White-winged Fairywren, White-browed Babbler, Crested Pigeon. Song Meter analysis confirmed Western Grasswren were present at site LEEP2 on the 7 December 2023. A total of ten bird species were detected at this site (refer Appendix C).

BAM site LEEP3 is located between fencing for the proposed Cultana Solar Farm and the Lincoln Highway. The vegetation association at this site comprised Western Myall / Black Oak (*Casuarina pauper*) over Bluebush / Black Bluebush / Bladder Saltbush +/- Sheep Bush (*Geijera linearifolia*) (Plate 3.3). Additional shrub species included Desert Goosefoot, Ruby Saltbush, Top-fruit Bluebush (*M. turbinata*), Mealy Saltbush and Umbrella Bush. Exotic flora species included moderate cover of Ward's Weed on bare spaces between shrubs and sparse cover of Brassica sp.

Song Meter 4 (SM4) was deployed at BAM site LEEP3, considered to provide suboptimal habitat (rating 3.5) for Western Grasswren. This rating was based on presence of trees for perching, lower cover of Ward's Weed and presence of preferred species such as Black Bluebush. During a bird survey no Western Grasswren were detected, and they were / were not detected via Song Meter (refer Section 3.5). However, a lack of detection, does not discount their presence, and it is noted that the species was detected near this site during another survey for HJP project (EBS 2023). Additional fauna species detected during the Lathwida survey included: Red Throat, Splendid Fairywren, Yellow-throated Miner, Chestnut-rumped Thornbill, Inland Thornbill, Welcome Swallow and Purple-backed Fairywren. A total of 17 bird species were detected at this site (refer Appendix C).

BAM site LEEP6 is located between the Cultana Solar Farm fenced area and the artificial salt evaporation pans. The vegetation association at the site comprised dominant overstorey species Western Myall / Black Oak +/- Bullock Bush over Broom Emubush (*Eremophila scoparia*), Black Bluebush / Bladder Saltbush +/- Spiny Fanflower (*Scaevola spinescens*) (Plate 3.4). Additional shrub species included Ruby Saltbush, Top-fruit Bluebush, Mealy Saltbush and Flannel Bush (*Solanum lasiophyllum*). Exotic flora species included moderate cover of Ward's Weed on bare spaces between shrubs and sparse cover of Wild Turnip (*Brassica sp.*). Exotic fauna species detected include European Fox, European Rabbit (*Oryctolagus cuniculus*) and Sheep (*Ovis aries*) scats.

SM2 was deployed at LEEP6, considered to provide suboptimal (rating 3) Western Grasswren habitat, based on presence of Ward's Weed in bare patches and trees to perch. Fauna detected included Crested Pigeon, Australian Raven, White Browed Babbler, Red Kangaroo (*Osphranter rufus*), Welcome Swallow and White-winged Fairywren. Western Grasswren were detected at the site via Song Meter (6 and 7 December, three detections in total). A total of 15 bird species were detected for the site (refer Appendix C).

BAM site LEEP9 was located in the Project Area between Port Bonython Road and the DoD Cultana Training Area where the vegetation association consists mainly of low regenerating Western Myall with scattered Bullock Bush (*Alectryon oleifolius ssp. canescens*) and False Sandalwood (*Myoporum platycarpum*). The understorey was sparse and consisted of Bladder Saltbush, Mealy Saltbush, Ruby Saltbush, Nitre-bush (*Nitraria billardierei*) and Desert Senna (*Senna artemisioides ssp. artemisioides*) among other shrub species. Wards Weed was also present moderate densities (Plate 3.5). Note this area is now adjacent the Project Area and is not in the Disturbance Footprint.

Preliminary BAM details are summarised in Table 3.7. The preliminary UBS for (based on 1 hectare) ranged from 44.76 to 71.19 for this broad vegetation community, with an average of 58.69. A summary of flora species detected during the assessment are provided in Appendix D.

Table 3.7: Low Open Woodlands of Western Myall +/- Black Oak +/- False Sandalwood with a Chenopod Understorey BAM Summary

BAM Site	EP BCM Community	Landscape context score ¹	Vegetation condition score	Conservation significance score	Unit Biodiversity Score (1 ha) ¹
LEEP2	EP 9.1	1.09	57.75	1.10	69.24
LEEP3	EP 9.1	1.09	59.38	1.10	71.19
LEEP6	EP 9.1	1.09	41.33	1.10	49.55
LEEP9	EP 9.1	1.06	38.39	1.10	44.76

¹Landscape context score and UBS to be updated once 'block' and 'cleared perimeter' agreed with NVMB



Plate 3.2: Western Myall over Chenopod, site LEEP2 (facing west)



Plate 3.3: Western Myall over Chenopod, site LEEP3 (facing north)



Plate 3.4: Western Myall / Black Oak +/- Bullock Bush over Broom Emubush / Chenopod shrubland, LEEP6 (facing north)



Plate 3.5: Western Myall +/- Bullock Bush over sparse Chenopod shrubland, LEEP9 (facing east)



Low Open Chenopod Shrublands

This vegetation community aligns with benchmark community EP 9.2 Chenopod Open Shrublands (Milne, Croft and Pedler 2008). BAM site LEEP4 was located between the Cultana Solar Farm fenced area and the artificial salt evaporation pans. The vegetation association comprised a Black Bluebush (*Maireana pyramidata*) / Bladder Saltbush (*Atriplex vesicaria*) low shrubland on loamy plains. Dominant chenopod species included Black Bluebush and Bladder Saltbush with other chenopod species present such as Top-fruit Bluebush (*M. turbinata*), Hairy-fruit Bluebush (*M. trichoptera*), Two-horn Saltbush (*Dissocarpus biflorus* var.), Ruby Saltbush (*Enchylaena tomentosa*) and Desert Goosefoot (*Chenopodium desertorum* ssp.) (Plate 3.6). Additional low shrubs included Round-leaf Pigface (*Disphyma crassifolium* ssp. *clavellatum*), Bindyi (*Sclerolaena obliquicuspis*), Spear-grass (*Austrostipa nitida*) and Bindweed species (*Convolvulaceae* sp.). There was dense cover of exotic flora (Ward's Weed, *Carrichtera annua*) on bare earth between shrubs.

During Survey One, Song Meter 1 (SM1) was deployed at BAM site LEEP4. This site was considered to represent suboptimal (rating 2) Western Grasswren habitat given the lack of trees to perch and the density of Ward's Weed / lack of bare earth to run between low chenopod shrubs. A European Fox was sighted near this location. Only one bird species detected during survey during hot and windy conditions, however 7 species were detected via Song Meter, including Western Grasswren (refer Appendix C). A total of 8 bird species were detected at this site.

During Survey Three additional representative flora sites included LEEP13, LEEP14, LEEP15 and LEEP16.

BAM site LEEP13 vegetation extends along Fitzgerald Bay Road. The vegetation association comprised Pearl Bluebush and Black Bluebush low shrubland on calcareous loam ranging in height from 0.5 to 1 m (Plate 3.7). Other species present included Bladder Saltbush, Broom Emubush (*Eremophila scoparia*), with sparse occasional clumps of emergent False Sandalwood (*Myoporum platycarpum*) tall shrubs. Additional lower shrubs and grasses included Shrubby Twinleaf (*Roepera eremaeum*), Silver Mulla Mulla (*Ptilotus obovatus*), Spiny Fanflower (*Scaevola spinescens*), Oblique-spined Bindyi (*Sclerolaena obliquicuspis*), Ruby Saltbush (*Enchylaena tomentosa*), and grass species (*Austrostipa* sp. *Rytidosperma caespitosum*). Exotic species that were present included Wards Weed, Smooth Mustard and Onion Weed. It was noted that vegetation in the road reserve was denser than vegetation in the fenced areas. One Western Grasswren was also briefly detected in similar vegetation along the road (BS07). A total of 19 bird species including Western Grasswren, White-wing Fairywren, Red Throat, Rufous Fieldwren and Purple-backed Fairywren were observed in the extension of this vegetation type along Fitzgerald Bay Road (Refer Appendix C (BS07, BS08 and Transect)).

BAM site LEEP15 is representative of a transition habitat between chenopod and samphire areas (Plate 3.9). The vegetation comprised Bladder Saltbush / Samphire (Brown-headed and Slender), Thyme Sea-heath and Round-leaf Pigface. Other species included Bush Minuria (*Minuria cunningahmii*), Bonefruit (*Osteocarpum* sp.) Black Bluebush (*Maireana pyramidata*), Top-fruit Bluebush (*Maireana turbinata*) and *Austrostipa* sp. Although this vegetation does not represent the preferred habitat of Western Grasswren, the species was detected at this site (heard during bird survey and detected by at least 4 calls on the Song Meter output). A total of 11 bird species were detected at this site including White-winged Fairywren,

Rufous Fieldwren (Refer Appendix C, BS06). Exotic flora detected included Wards Weed, Onion Weed and Boxthorn.

BAM site LEEP16 is also representative of a transition habitat between chenopod and samphire areas. This vegetation occurs adjacent plains of chenopod / samphire. The dominant species included Bladder Saltbush and Thorny Lawrencia (*Lawrencia squamata*). Other key species included Round-leaf Pigface, Thyme Sea-heath, Bush Minuria, Bonefruit and Cottony Goosefoot (*Chenopodium curvispicatum*). Whilst the vegetation was a low shrubland on plains there were sparsely scattered tall shrubs of Broom Emubush, False Sandalwood and Native Cherry. A total of 7 bird species were detected at this site including White-winged Fairywren, Spiny-cheeked Honeyeater and Common Starling (Refer Appendix C, BS10).

BAM site LEEP14 is representative of very low chenopod vegetation that extends along Port Bonython Road that is no longer within the Project Area / Disturbance Footprint (Plate 3.10). Dominant chenopods include Spiny Saltbush and Spiny Fanflower, along with Pearl Bluebush, Bladder Saltbush, Thorny Lawrencia and Australian Boxthorn. There are also scattered areas with emergent False Sandalwood tall shrubs, with some large patches that have been mapped out.

Numerous vegetation check sites were also collected to inform mapping (refer Figure 3.5, Appendix B).

Preliminary BAM details for this vegetation community are summarised in Table 3.8. A summary of flora species detected during the assessment are provided in Appendix D.

Table 3.8: Chenopod Open Shrublands BAM Summary

BAM Site	EP BCM Community	Landscape context score ¹	Vegetation condition score	Conservation significance score	Unit Biodiversity Score (1 ha) ¹
LEEP4	EP 9.2	1.09	50.31	1.10	60.32
LEEP13		1.09	66.51	1.10	79.74
LEEP14		1.06	64.34	1.10	75.02
LEEP15		1.09	60.05	1.10	72.00
LEEP16		1.09	64.15	1.10	76.91

¹Landscape context score and UBS to be updated once 'block' and 'cleared perimeter' agreed with NVMB



Plate 3.6: Black Bluebush / Bladder Saltbush open shrubland over Ward's Weed, site LEEP4 (facing north)



Plate 3.7: Pearl Bluebush +/- Black Bluebush low shrubland, site LEEP13 (facing north)



Plate 3.8: Bladder Saltbush +/- Black Bluebush +/- Samphire, site LEVC5 (facing south)



Plate 3.9: Bladder Saltbush / Samphire on plains, site LEEP15 (facing north)



Plate 3.10: Bladder Saltbush / Thorny Lawrencia low shrubland on sandy saline plains, site LEEP16 (facing east)



Plate 3.11: Spiny Saltbush / Spiny Fanflower +/- Pearl Bluebush low shrubland +/- emergent False Sandalwood, site LEVC14 (facing north)



Yorrell / Beaked Red Mallee / Red Mallee with Open Sclerophyll Shrub over Chenopod Understorey

This vegetation community aligns with benchmark community BCM EP 8.1 Mallee and Low Woodlands with Open Sclerophyll Shrub and Chenopod Understorey (Milne, Croft and Pedler 2008). Representative vegetation associations include data collected at BAM sites LEEP5, LEEP7, LEEP8, LEEP10 and LEEP12.

BAM site LEEP5 was representative of a mallee vegetation association along Port Bonython Road. Mallee vegetation in this location grades into and out of sandy plains over limestone and low dunes. Dominant mallee species included Yorrell (*Eucalyptus gracilis*) and Beaked Red Mallee (*E. socialis*) (Plate 3.12). Sclerophyll shrubs present included False Sandalwood (*Myoporum platycarpum*), Sheep Bush (*Geijera linearifolia*), Stiff Westringia (*Westringia rigida*), Umbrella Bush (*Acacia ligulata*), Desert Senna (*Senna artemisioides ssp. artemisioides x ssp. coriacea*) and Muehller' Daisy-Bush (*Olearia muelleri*). Chenopod shrubs that were present included Ruby Saltbush (*Enchylaena tomentosa*) and Mealy Saltbush (*Rhagodia parabolica*). Exotic flora species detected included Ice Plant species (*Mesembryanthemum sp.*) and Mustard (*Sisymbrium sp.*). A number of existing tracks occurred near the BAM site and there are existing tracks in similar vegetation either side of Port Bonython Road. Additional photos are provided in Appendix B.

BAM sites LEEP8 (Plate 3.13) and LEEP12 (Plate 3.14) are both located in the Project Area between Port Bonython Road and Cultana DoD area. The vegetation associations in these areas includes an overstorey dominated by Red Mallee (*E. oleosa*) and Beaked Red Mallee, with Yorrell and Narrow-leaf Red Mallee (*E. leptophylla*) also present. The understorey is dominated by Dryland Tea-tree (*Melaleuca lanceolata*), Bluebush Daisy (*Cratystylis conocephala*), Bladder Saltbush (*Atriplex vesicaria*), Broad-leaf Desert Senna (*Senna artemisioides ssp. X coriacea*), Bullock Bush (*Alectryon oleifolius ssp. canescens*) and Mealy Saltbush, but also includes Ruby Saltbush, Intricate Saltbush (*Rhagodia ulicina*) and Umbrella Bush among others. Three exotic plant species were recorded at these sites, African Boxthorn (*Lycium ferocissimum*) which is classified as a WoNS was recorded at site LEEP8 and Ward's Weed (*Carrichtera annua*) and Common Ice Plant (*Mesembryanthemum crystallinum*) was recorded at site LEEP 12. Of note, a flock of well over 200 EPBC listed as Migratory Fork-tailed Swift (*Apus pacificus*) were observed over 200 m above site LEEP12. These birds are aerial by nature and do not use terrestrial vegetation for roosting, nesting or foraging.

BAM sites LEEP7 (Plate 3.15) and LEEP10 (Plate 3.16) are both located on flat to slightly undulating plains with loamy soils within the Project Area between Port Bonython Road and the DoD Cultana Training Area. The overstorey at these sites are dominated by False Sandalwood and Red Mallee, while the under storey is dominated by shrubs, particularly Bladder Saltbush, Bullock Bush and Intricate Saltbush. Other species present in the overstorey include Western Myall (*Acacia papyrocarpa*) and Nundroo Mallee (*E. calcareana*), and in the understorey Umbrella Bush, Spiny Saltbush (*Rhagodia spinescens*), Bluebush (*Maireana sedifolia*), Nitre-bush (*Nitraria billardierei*) and Australian Boxthorn (*Lycium australe*). A notable difference between the two sites was that False Sandalwood, Desert Senna (*Senna artemisioides ssp. petiolaris*), Bladder Saltbush, Intricate Saltbush and Bluebush all were regenerating at LEEP10 while there was no regeneration recorded at LEEP7. Two species of exotic plants were recorded at low to medium densities at both sites; Onion Weed (*Asphodelus fistulosus*) and Wards Weed.

Preliminary BAM details for this vegetation community are summarised in Table 3.9, UBS ranged from 60.92 to 77.38 and average was 70.34. A summary of flora species detected during the assessment are provided in Appendix D.

Table 3.9: Mallee BAM Summary

BAM Site	EP BCM Community	Landscape context score ¹	Vegetation condition score	Conservation significance score	Unit Biodiversity Score (1 ha) ¹
LEEP5	EP 8.1	1.09	64.00	1.10	76.74
LEEP7	EP 8.1	1.06	52.25	1.10	60.92
LEEP8	EP 8.1	1.06	54.00	1.10	62.96
LEEP10	EP 8.1	1.06	66.36	1.10	77.38
LEEP12	EP8.1	1.06	63.20	1.10	73.69

¹Landscape context score and UBS to be updated once 'block' and 'cleared perimeter' agreed with NVMB]



Plate 3.12: Yorrell / Red Beaked Mallee with Open Sclerophyll Shrub and Chenopod Understorey (facing north to Port Bonython Road)



Plate 3.13: Red Mallee / Red Beaked Mallee with Open Sclerophyll Shrub and Chenopod Understorey (facing west)



Plate 3.14: Red Mallee with Open Sclerophyll Shrub and Chenopod Understorey (facing south)



Plate 3.15: False Sandalwood / Red Mallee Woodland over Chenopod Shrubland (facing east)



Plate 3.16: False Sandalwood / Red Mallee Woodland over Chenopod Shrubland (facing south)

Tall Coastal Shrubland

This vegetation community aligns with BCM EP 12.2 Coastal Shrublands of Stable Dunes & Cliff top Dunes. BAM site LEEP11 (Plate 3.17) is located on a low stable sand dune protected from wind erosion by surrounding mallee and woodlands. The vegetation association at the site is dominated by three shrub species Narrow-leaf Hop-bush (*Dodonaea viscosa*), Umbrella Bush (*Acacia ligulata*) and Desert Senna (*Senna artemisioides ssp. petiolaris*). Other species include Gawler Ranges Senna (*Senna cardiosperma ssp. gawlerensis*), Ruby Saltbush (*Enchylaena tomentosa*), Inland Pigface (*Carpobrotus modestus*), New Zealand Spinach (*Tetragonia tetragonoides*), New Holland Daisy (*Vittadinia sp.*), Bullock Bush (*Alectryon oleifolius*), Climbing Lignum (*Muehlenbeckia adpressa*) and Feather Spear-grass (*Austrostipa elegantissima*). Three species of exotic plants were recorded in low to moderate densities, Onion Weed (*Asphodelus fistulosus*), Wards Weed (*Carrichtera annua*) and Common Ice Plant (*Mesembryanthemum crystallinum*).

Preliminary BAM details are summarised in Table 3.10. A summary of flora species detected during the assessment are provided in Appendix D.

Table 3.10: Coastal Shrublands BAM Summary

BAM Site	EP BCM Community	Landscape context score ¹	Vegetation condition score	Conservation significance score	Unit Biodiversity Score (1 ha) ¹
LEEP11	EP 12.2	1.06	62.50	1.10	72.88

¹Landscape context score and UBS to be updated once 'block' and 'cleared perimeter' agreed with NVMB



Plate 3.17: Tall Sclerophyll Shrubland on Coastal Dune (facing north)

Weeds

Opportunistic weed locations were noted at four sites, and weeds were also highlighted under BAM descriptions. A summary of weeds detected during the two surveys are provided in Table 3.11.

Table 3.11: Summary of Weeds Detected During Survey of PSL Area, December 2023/March 2024

Common Name	Scientific Name	Location	Weed Status	Comment
Wild Turnip	<i>Brassica sp.</i>			Sparsely present throughout the PSL
Horehound	<i>Marrubium vulgare</i>	LEOP1, LEOP2	Landholders required to manage in EP	Scattered clumps
Prickly Pear	<i>Opuntia</i>	LEOP4	*Declared, WoNS	Clump, refer Plate 3.18
Mustard	<i>Sisymbrium sp.</i>	LEEP5		Sparsely present
Ice Plant	<i>Mesembryanthemum sp.</i>	LEEP5, LEOP2		Present in mallee areas
Ward's Weed	<i>Carrichtera annua</i>	LEVC8, also see BAM sites		Ranging from sparse (1) to moderately dense (4) across the PSL Area
Onion Weed	<i>Asphodelus fistulosus</i>	LEVC6		Present in road reserve
African Boxthorn	<i>Lycium ferocissimum</i>	LEEP8	*Declared, WoNS	Only one plant recorded

*Declared under Landscape SA Act, WoNS = Weed of National Significance



Plate 3.18: Declared and WoNS Exotic Species, Prickly Pear, site LEOP4



Plate 3.19: Exotic species, Horehound, site LEOP1

3.5 Fauna field results

3.5.1 Survey One – Western Grasswren survey

The four Song Meters deployed as part of Survey One were located in the most suitable Western Grasswren habitat that could be accessed within the PSL Area east of the Lincoln Highway (Figure 3.6). The total survey effort across all sites was 75.25 hours. A summary of the Song Meter effort, habitat type and suitability of habitat for Western Grasswren is provided in (Table 3.12). Analysis of Song Meter results indicated that Western Grasswren were detected at three of the four deployment sites. The location of the sites is shown in Figure 3.6.

Table 3.12: Summary of Song Meter Effort and Western Grasswren Results (Survey 1)

Song Meter Site	Recoding time	Hours	Habitat Suitability	Vegetation Community	Western Grasswren Detected
LESM01	6/12/2023 8.30 to 7/12/2023 14:30	19	2 (marginally suitable)	Chenopod shrubland	Yes
LESM02	6/12/2023 8:30 to 7/12/2023 15:15	19.25	3 (suboptimal)	Western Myall +/- Black Oak / Bullock Bush over chenopod	Yes
LESM03	6/12/2023 9.30 to 7/12/2023 15:30	18.5	3.5 (moderately suitable)	Western Myall over chenopod shrubland	Yes
LESM04	6/12/2023 9:30 to 7/12/2023 15:30	18.5	3.5 (moderately suitable)	Western Myall / Black Oak over chenopod shrubland	No

Song Meter diversity results

A total of 24 species of birds were identified in Song Meter recordings. Total site diversity (Song Meter only) of birds ranged from seven species at Site 1 to 15 species at Site 4. Recordings were dominated by Fairywrens (Purple-backed Fairywren, White-winged Fairywren, Splendid Fairywren), White-browed Babbler, Chestnut-rumped Thornbill and Little Raven (Appendix C).

As per BAM descriptions in Section 3.4, additional species were detected via Bird Surveys undertaken at Song Meter sites and opportunistic species were also detected. Hence of total of 26 bird species were detected during the survey (Appendix C).

3.5.2 Survey Two – Malleefowl survey

Survey Two for detection of Malleefowl presence was conducted along Port Bonython Road in March 2024. The survey was conducted in 42.2 hectares of habitat which intersected with the proposed pipeline temporary disturbance area as it stood at the time. This area had previously been mapped as mallee (refer Figure 3.2, Figure 3.3) and therefore potential Malleefowl habitat. Two ecologists (one NVC accredited) surveyed the 60 m wide proposed disturbance corridor for signs of Malleefowl (e.g. mounds, footprints). The corridor was surveyed by walking parallel transects within the corridor (i.e. up on side and back the

other side, with approximately 15 to 20 m between). A total of 12 dedicated person hours were spent searching for Malleefowl. The search effort being greater than the 10 person hours per 50 ha recommended in the 'Survey guidelines for Australia's threatened birds' (DEWHA 2010). No evidence of Malleefowl was detected during the survey. In addition, an extra 8 person hours was spent within the 42 ha conducting vegetation assessments, as per Section 3.4 (e.g. six additional BAM assessments further refining the vegetation mapping within the Project Area along Port Bonython Road). These vegetation types included two mallee habitats, Acacia shrubland regrowth and Western Myall over Chenopod. The area with Western Myall over Chenopods was not considered suitable Malleefowl habitat due to stoney ground and very sparse leaf litter, neither was a small area of vegetation mapped as low Samphire and Chenopods. The remaining 33.6 hectares within the temporary disturbance area (current at the time of survey) was considered suitable Malleefowl habitat (primarily foraging, nesting only suitable in the deeper sandier areas of mallee).

Whilst no Malleefowl or signs of were detected, one Migratory species was observed aerially greater than 200 m above site LEEP12 on March 12 2024; a flock of 200 plus Fork-tailed Swift (*Apus pacificus*).

3.5.3 Survey Three – Disturbance Footprint updates

As per Section 2.2 and Section 3.4 above, Survey Three conducted in August 2024 included further Bird Survey effort along with additional vegetation survey and ground-truthing due to the slight change in Disturbance Footprint. Additional Bird Survey effort was concentrated around the centre and eastern end of the Disturbance Footprint in habitat considered suitable for Malleefowl, Western Grasswren and Southern Whiteface.

Western Grasswren / Southern Whiteface

No Southern Whiteface were detected during Bird Surveys or Song Meter deployment and there was no response to call-playback, however there are recent (2023) records at some of the survey sites (DEW 2024), hence the species is considered known to occur.

Western Grasswren were detected at two sites, one along Port Bonython Road in habitat considered of low suitability (very low Chenopod shrubland transitioning to Samphire shrubland) and along Fitzgerald Bay Road in suitable Chenopod Shrubland. A summary of survey effort and Western Grasswren results is provided in Table 3.13.

Table 3.13: Summary of Song Meter Effort and Western Grasswren Results (Survey 3)

Song Meter / Bird Survey Site	Recoding time / Survey time	Minutes ¹	Habitat Suitability	Vegetation Community	Western Grasswren Detected
LESM05 / LEBS05	Song Meter error, no data. BS 28/08/24 2:15-2:50pm BS 29/08/24 8:05-8:35am BS 30/08/24 10:50-11:00am	BS = 70 BS = 60 BS = 20	2 (marginally suitable)	Low Chenopod shrubland (no previous records)	No
LESM06 / LEBS06	28/8/24 3:00pm to 30/8/24 10:30am BS 28/08/24 3:05-3:40pm BS 29/08/24 7:40-8:00am BS 30/08/24 10:30-10:40am	SM = 2220 BS = 70 BS = 40 BS = 20	2 (marginally suitable)	Low Chenopod / Samphire shrubland on plains (no previous records)	Yes
LESM07 / LEBS07	Song meter fail, no data BS 28/08/24 4:00-4:10pm BS 29/08/24 8:55-9:25am BS 30/08/24 8:00-8:20am	BA = 10 BS = 60 BS = 40	3.5 (moderately suitable)	Chenopod shrubland (no previous records) Drainage lines nearby and dense spiny shrubs present	Yes
LESM08 / LEBS08	Song meter fail, no data BS 28/08/24 4:15pm BS 29/08/24 9:30-10:00am BS 30/08/24 8:30-8:50am	BS = 10 BS = 60 BS = 40	3.5 (moderately suitable)	Chenopod shrubland / mixed shrubland in minor ephemeral drainage line (no previous records)	No
LEBS_transect 01	BS 29/08/24 10:00-10:30am	BS = 60	4 (suitable)	Tall Chenopod Shrubland / mixed tall shrubs (no previous records)	No
LEBS09	BS 29/08/24 1:00-1:30pm	BS = 60	NA	Coastal / Beach	NA
LEBS10	BS 29/08/24 4:30-4:50pm BS 30/08/2024 9:10-9:30am	BS = 40 BS = 40	1 (unsuitable)	Samphire +/- Chenopod low shrublands with infrequent inundation / saline soils (no previous records)	No
Total		Song Meter 2220 minutes (37 hours) over 3 days Bird Survey 640 minutes (10.6 hours) over 3 days (excludes coastal area)			

¹ Bird Survey effort = two person minutes combined, longer survey effort when conditions were optimal (i.e. no wind)

Malleefowl

No Malleefowl or evidence of Malleefowl were detected along the Malleefowl transect assessed during Survey Three (refer Figure 3.7). In addition, as per Section 2.2.2 above, desktop assessment of raw LiDAR data suggested 13 potential Malleefowl mounds occur in the PSL Area. Of these, three were categorised as 'not a mound', four were unlikely to be a mound, three were likely and three were possible. All sites categorised as likely, possible to unlikely were ground-truthed in the field in September (Epic Energy pers. com.). No Malleefowl mounds were detected. Photos of the data points categorised as 'likely' are provided in Appendix C4.

3.5.4 Survey Effort Summary

In summary, in addition to regional surveys for the larger HJP and Northern Water project, three surveys have been conducted within the Project Area to inform the approvals relating to flora and fauna. The survey effort is summarised in Table 3.14 below.

Table 3.14: PSL Area ecology survey effort summary

Category	Resource	Broad Survey Type	Effort	Year	Location
Flora	Jacobs	BAM and vegetation / habitat mapping	9 BAMs	2022 - 2023	PSL Area
Fauna	Jacobs	Song Meter deploy and Bird Surveys	5 Song Meter site (80 hrs minimum), 14 Bird Surveys (10 hrs minimum)	2022 - 2023	PSL Area
Fauna	EBS	Bird Surveys	24 Bird Surveys (16 hrs minimum)	Spring 2023	PSL Area
Flora	Lathwida	BAM and Vegetation Check	16 BAMs; 52 Vegetation Checks to inform mapping updates	2023 / 2024	Project Area / PSL Area
Fauna	Lathwida	Song Meter deploy and Bird Surveys	8 Song Meter sites (112 hours); 10 Bird Surveys (10 hours minimum); 2 Bird Transects (1 hr)	Early Summer 2023 / Winter 2024	Project Area / PSL Area



Figure 3.6: Song Meter deployment sites



Figure 3.7: Bird Survey effort

3.6 Likelihood assessment

A number of prefeasibility desktop and field surveys have been undertaken in the Whyalla to Port Bonython region, e.g. for the Northern Water Supply Project, Port Bonython Hydrogen Hub project and the Hydrogen Jobs Plan. Most recently surveys were conducted by Jacobs during spring / early summer, autumn 2022 / 2023 (Jacobs 2023a, 2023b, 2023c). Jacobs (2023a) (PBHH) generally overlaps with the PSL Area in the east, but only included the Port Bonython Road and did not include some areas in the west of the PSL Area, e.g. the Moomba to Adelaide Pipeline System. There are also areas of Jacobs (2023b) and Jacobs (2023c) that overlap with western extent of the PSL Area (west of Lincoln Highway).

Updated likelihood of occurrence for threatened species (flora and fauna), threatened ecological communities and migratory species, relevant to the PSL Area, are provided below.

3.6.1 Threatened Flora and Ecological Communities

Threatened Ecological Community

Similar to previous assessments, one TEC was suggested as likely occurring within the Study Area; *Subtropical and Temperate Coastal Saltmarsh* (Vulnerable) (Appendix A). For TECs that are listed as Vulnerable, EPBC referral is not required, however impacts should be mitigated near saltmarsh communities which also provide habitat for Nationally threatened and Migratory bird species (e.g. shorebirds such as Curlew Sandpiper, and there are records for this species in the salt evaporation ponds). These areas may also provide occasional foraging habitat for Blue-wing Parrot (Morelli 1995).

The PSL Area includes areas mapped as coastal saltmarsh (Stranded Tidal Flat Samphire - intact) that are located adjacent Port Bonython Rd and northeast to east of salt evaporation ponds (in False Bay). There are also areas of salt pan, chenopod shrubland and samphire shrubland in this area. Whilst these areas are mapped as saltmarsh, they are excluded from the TEC Saltmarsh criteria given it is 'stranded saltmarsh' (as per page 17 DSEWPAC 2013). However, it is noted that stranded saltmarsh and the adjacent communities (samphire shrubland, chenopod shrubland) would provide a buffer to the intertidal saltmarsh that occurs south of the salt evaporation ponds along the coast of False Bay (refer Coastal Saltmarsh and Mangrove Mapping, NatureMaps DEW 2024). There is intact intertidal saltmarsh south of the salt evaporation ponds would classify as the EPBC listed TEC. These areas also form part of a Wetland of National Significance; Upper Spencer Gulf (Morelli 1995). Once final footprints are determined, some further assessment may be required to ensure impacts to any saltmarsh (TEC and non-TEC) are minimized and appropriate offsetting is achieved (e.g. via approved vegetation clearance).

In summary, vegetation that represents the EPBC listed TEC does not occur within the PSL Area, but buffer vegetation does occur (e.g. stranded saltmarsh that would support Migratory species but is not core habitat).

Threatened Flora

Similar to previous assessments, the PMST suggested four threatened flora species as potentially occurring within the Study Area. Following a likelihood assessment, it is considered that three of these species are unlikely to occur, based on a lack of historic records, a lack of suitable habitat and no EPBC listed flora species have been observed during field surveys to date Jacobs (2023a). Whilst there are no records for any EPBC listed flora species within the Study Area, one species is considered to possibly occur in mallee areas, given it can remain dormant and responds to fire and disturbance; Yellow Swainson-pea (*Swainsona pyrophila*). Whilst the species was not detected during the survey, further assessment may be required following final footprint determination.

In addition, Jacobs (2023a) suggested samphire shrubland within the Study Area may support EPBC listed as vulnerable Bead Samphire (*Tecticornia flabelliformis*). There are no records for this species around Point Lowly/Port Bonython (or along the coast north and south of Whyalla) (BDBSA 2023, DEW 2024). The saltmarsh in the Study Area is mapped as 'stranded', hence lacks regular tidal inundation, the species is therefore unlikely to occur, however the species does occur around salt lake margins and artificial salt evaporation pans (which are present adjacent the PSL Area). It is also noted that some of these areas include historical sand quarried areas, which may also reduce the likelihood of occurrence. Species presence should be considered possible in areas mapped as samphire (infrequent inundation / on saline plains), however these areas are avoided by the Project.

Table 3.15: EPBC Threatened Flora Likelihood Assessment for PSL Area

Common Name	Scientific Name	AUS Status ¹	SA Status ²	Potential in PSL Area	Justification Comment
Greencomb Spider-orchid, Rigid Spider-orchid	<i>Caladenia tensa</i>	EN	-	Unlikely	PMST output suggested may occur in the Study Area. Perennial winter active orchid, growing to 35 cm, in sandy loams derived from Aeolian deposits, in <i>Callitris spp.</i> (cypress pine), <i>Eucalyptus leucoxylon</i> (yellow gum) woodland and <i>Melaleuca uncinata</i> (broombush) mallee (TSSC 2016). Taxonomy assessment concluded that it is widespread in eastern SA (Cape Gantheaume CP, Billiat CP and the Mount Boothby CP There are no previous records within 5 km of the Project Area (for any <i>Caladenia</i> sp.) (BDBSA 2023). Not detected during previous surveys (Jacobs 2023a, 2023b, Infrastructure SA 2024) and suitable habitat not present in PSL Area (Lathwida, this survey).
Braided Sea Heath	<i>Frankenia plicata</i>	EN	V	Unlikely	PMST output suggested may occur in the PSL Area. Small arid zone shrub known from a limited number of scattered records in run-on areas across northern SA, well north of Port Augusta (DEWHA 2008, ALA 2023). Grows in a range of habitats, in a wide range of vegetation communities that have good drainage (Neagle, 2002 cited n DEWHA 2008). The SA Herbarium has undertaken review of lodged specimens that were mis-identified given the difficulty in separating this species from the common <i>F. serpyllifolia</i> . The SA Flora database and MNES distributions are being updated to reflect this (H Vonow, SA Herbarium Pers. Comm). There are no previous records within 5 km of the PSL Area (BDBSA 2023). Has not been detected in surveys to date (Jacobs 2023a, 2023b, Infrastructure SA 2024), Lathwida this survey. There are two records for the common <i>F. serpyllifolia</i> from 1996, with low spatial reliability.
Desert Greenhood	<i>Pterostylis xerophila</i>	VU	V	Unlikely	PMST output suggested may occur in the Study Area. Distribution is restricted to isolated populations from Eyre Peninsula (SA) to northwestern Victoria (ALA 2024). Difficult to detect as tubers remain dormant below ground until years with favourable rainfall and growing season only lasts a few months. Has been located within areas mapped as <i>Eucalyptus incrassata</i> mid mallee woodland (DEW 2024). However, it is more typically associated with <i>Melaleuca uncinata</i> (Broombush) tall shrubland over <i>Babingtonia behrii</i> +/- <i>Calytrix involucreata</i> low shrubs over <i>Triodia irritans</i> +/- <i>Hibbertia</i> sp., typically with granite outcropping (cited in JBSG 2022). Mallee mapped as occurring in the Study Area includes: <i>E. gracilis</i> +/- <i>E. dumosa</i> +/- <i>E. brachycalyx</i> +/- <i>E. oleosa</i> over Dryland Tea Tree (<i>Melaleuca lanceolata</i>) (DEW 2024). Mallee occurrence in parts of the PSL Area was confirmed in recent surveys, primarily <i>E. oleosa</i> (Jacobs 2023a, Lathwida this survey). There are no previous records within 5 km of the PSL Area (BDBSA 2023). Not detected during surveys to date and mallee present in the PSL Area is not considered typical for the species.
Bead Samphire / Bead Glasswort	<i>Tecticornia flabelliformis</i>	VU	V	Possible	Not suggested in PMST output. Small succulent scattered in saltmarsh across Australia. Known from near Meningie in south-east to near Ceduna in far west of SA. Occurs on the margins of salt lakes, saline flats, evaporation pans and coastal saltmarshes, require occasional inundation. Prefers heavy clay soils. Most easily detected January to May (DECCEW 2024b, Carter 2010). Given the presence of salt pans in the PSL Area (some artificial), considered possible to occur, but given stranded inundation regime and historical sand quarrying, habitat may not be suitable. No records within 5 km of the PSL (BDBSA 2023), not detected during high level surveys to date (Lathwida 2024).
Yellow Swainson-pea	<i>Swainsona pyrophila</i>	VU	R	Possible	PMST output suggested may occur in the Study Area. Grows in mallee on variety of soil types including sandy or loamy soil. Has been recorded from mallee woodland with <i>Eucalyptus brachycalyx</i> , <i>E. incrassata</i> <i>E. calycogona</i> , <i>E. dumosa</i> , <i>E. gracilis</i> , <i>E. incrassata</i> , <i>E. leptophylla</i> , <i>E. oleosa</i> and <i>E. socialis</i> , sometimes with Broombush (<i>Melaleuca uncinata</i>) tall shrubland (Tonkinson and Robertson (2010). Known to respond favourably to disturbance and after fire and subsequent rain, only living for two years after fire (Tonkinson & Robertson 2010). There are no records within 5 km of the PSL Area, nearest records are in Munyaroo CP and Ironstone Hill CP (BDBSA 2023, DEW 2024). Not detected during surveys to date (Jacobs 2023a, Lathwida 2024). However, some of the preferred mallee species do occur in the PSL Area, hence considered possible.

¹EPBC Act status: Endangered (EN); Vulnerable (VU).

²South Australian National Parks and Wildlife Act (NPW Act) 1972 status: Endangered (E); Vulnerable (V); Rare (R).

Records from Biological Databases of SA (BDSA 2023) (Recordset number: DEWNRBDBSA231020-1, within 5 km, post 1995, < 1 km spatial reliability unless otherwise stated).

State Listed Flora

There are records for five state listed (under the NPW Act) flora in the Study Area. Recent and reliable records are summarised in Table 3.16.

If these species occur within vegetation communities that will be impacted, they would be incorporated into the vegetation assessment sheets and contribute the conservation score and offset where impact will occur.

Table 3.16: State Listed Flora Records within Study Area

Common Name	Scientific Name	SA Status ¹	Potential in PSL	Brief Justification Comment
Weeping Myall	<i>Acacia pendula</i>	V	Unlikely	1 record in Study Area (2018, spatial reliability <1 km, in the town of Whyalla, no other records on Eyre Peninsula).
Dagger-leaf Wattle	<i>Acacia rhigiophylla</i>	R	Unlikely	1 historical record (1983) in Study Area, spatial reliability <1 km. Record is in the town of Whyalla, most records are south to west of Ironstone CP.
	<i>Austrostipa plumigera</i>	R	Unlikely	1 historical record (1952), spatial reliability >1 km
Australian Broomrape	<i>Orobanche cernua</i> var. <i>australiana</i>	R	Likely	3 records (1995–2011), spatial reliability >1 km, one record is in the PSL Area.
Sandalwood	<i>Santalum spicatum</i>	V	Likely	4 records (1996–2020), spatial reliability <1 km. Records from Myall Woodland / Whyalla CP.

¹South Australian National Parks and Wildlife Act 1972 status: Endangered (E); Vulnerable (V); Rare (R).

Records from Biological Databases of SA (BDSA 2023) (Record set number: DEWNRBDBSA231020-1, within 5 km, post-1995, <1 km spatial reliability unless otherwise stated).

3.6.2 Threatened Fauna

EPBC listed fauna

A number of prefeasibility desktop and field surveys have been undertaken in the Whyalla to Port Bonython region, e.g. for the Northern Water Project and HJP Project. Most recently surveys were conducted by Jacobs during spring / early summer, 2022 / 2023 (Jacobs 2023a). The desktop component of the Jacobs (2023a) report suggested that twelve EPBC listed threatened fauna species have potential to occur in the Study Area; one is considered known – Malleefowl (*Leipoa ocellata*, VU), two are likely – Southern Whiteface (*Aphelocephala leucopsis*, VU), Western Grasswren (*Amytornis textilis myall*, VU) ten are possible (Blue-winged Parrot (*Neophema chrysotoma*), Grey Falcon (*Falco hypoleucos*), eight coastal / shorebirds).

The updated PMST output (January 2024 extract, Appendix A) is generally consistent with the April output provided in Jacobs 2023, however there were some additional species highlighted, and there are several new threatened species listings / species with status changes. A summary of the threatened species and their likelihood of occurrence status for the Study Area is summarised in Table 3.17. The updated PMST highlighted 46 threatened fauna species as potentially occurring within the Study Area, including 22 oceanic and marine species that were not considered further (e.g. two mammals, nine albatrosses, four petrels/prions/shearwater, two sharks, two fish, three turtles). Twenty-four threatened fauna were considered further in a likelihood assessment; including 22 birds, one mammal and one reptile.

The outcomes of the likelihood assessment suggest that of the 24 species, five have potential to occur in the PSL Area; three are known (Malleefowl, Southern Whiteface, Western Grasswren) and two have potential to occur (Blue-wing Parrot, Grey Falcon). The remaining nineteen species are considered unlikely, however ten of these are shorebirds that have potential to occur or are known to visit the adjacent saltfields / salt evaporation ponds (Ruddy Turnstone, Sharp-tailed Sandpiper, Red Knot, Curlew Sandpiper, Great Knot, Greater Sand Plover, Eastern Curlew, Eastern Hooded Plover, Fairy Tern and Common Greenshank). Some of these species may also occur in stranded saltmarsh / samphire areas following rainfall.

Malleefowl are likely to occur in mallee that occurs along Port Bonython Road and in patches at the southern end of the PSL Area that are currently avoided by the existing pipelines and proposed route at the eastern edge of the PSL Area. Given the lack of deep sandy soils and limestone near the surface along Port Bonython Road it is likely that this mallee only represents foraging and cover habitat for the species (Jacobs 2023a). Whilst the current survey by Lathwida did not find evidence of Malleefowl (refer Section 3.5), the vegetation mapped as mallee within the PSL Area would provide suitable foraging habitat. Southern Whiteface may also utilise such habitats for nesting and roosting. Western Grasswren, if present would likely occur in Chenopod / Western Myall habitat at the western end of the PSL Area closer to Whyalla CP where they are known to occur and were detected during the current survey. There are also atypical Chenopod habitats to the northeast of the PSL Area that have not been extensively assessed given they are on the boundary of DoD land that has recently been transferred, where there was risk of UXO and limited site access. Western Grasswren has been detected (via Song Meter) in very low Chenopod habitats intergrading with samphire north of Port Bonython Road and in more suitable denser / taller Chenopod habitats south of Fitzgerald Bay Road. These areas are either avoided by the Project or disturbance is minimised and localised to areas adjacent the existing Road. Similarly, Southern Whiteface and Blue-winged Parrot would utilise chenopod habitats, and Blue-winged Parrot may also forage in samphire habitats where grasses are present. Blue-winged Parrot would not nest in the region, and would only be present in small numbers during Winter.

Table 3.17: EPBC listed Threatened Species Likelihood Assessment for PSL Area

Common Name	Scientific Name	AUS Status ¹	SA Status ²	Potential in PSL Area	Justification Comment ³
Western Grasswren	<i>Amytornis textilis myall</i>	VU	V	Known	<p>PMST suggests known in PSL Area.</p> <p>Prefers low shrublands, primarily comprising Black Bluebush (<i>Maireana pyramidata</i>) and Australian Boxthorn (<i>Lycium australe</i>), however also less typically prefers low woodlands, comprising Western Myall (<i>Acacia papyrocarpa</i>) and Senna shrublands (Black et al., 2009). Preferred habitats are in drainage lines, low rocky hills and semi-arid woodlands. Specifically, the Myall Creek and Pine Creek drainages of the north-eastern EP, bounded in the south by Munyaroo CP, and in the north towards Lake MacFarlane and eastern Lake Gairdner and Lake Gilles CP (Garnet and Baker 2021).</p> <p>BDBSA: over 30 recent spatially reliable records (2006–2019) within 5 km of the Project Area within Whyalla CP / HA1588 (BDBSA 2023).</p> <p>Birdlife (BL): 15 records (1999–2019) from Whyalla CP / Wild Dog Hill (BDBSA 2023).</p> <p>Areas of Western Myall low woodland over chenopods in the Study Area near Lincoln Highway provide suitable habitat, particularly where Black Bluebush is present. There are known records in such vegetation west of Lincoln Highway, contiguous with Whyalla CP.</p> <p>Species has been detected via Song Meter and bird survey west of Lincoln Highway (Jacobs 2023a), and in limited suitable habitat east of Lincoln highway in early summer 2023 at 3 of 4 Song Meter sites, (Lathwida 2024 this report), and near the 4th Song Meter site (EBS 2023). Species has also been detected in 2024 along Port Bonython Road (Song Meter) and Fitzgerald Bay Road (Bird Survey) (Lathwida 2024, this report).</p> <p>There is suitable habitat in the PSL Area (Chenopod / Western Myall woodlands, Chenopod Shrubland), with greater numbers detected closest to Lincoln Highway.</p>
Southern Whiteface	<i>Aphelocephala leucopsis</i>	VU	-	Known	<p>PMST suggests known in PSL Area.</p> <p>Species was added to the threatened fauna list under the EPBC 31 March 2023 (DCCEEW 2023b).</p> <p>Occurs across most of mainland Australia south of the tropics in a wide range of open woodlands and shrublands where there is an understorey of grasses or shrubs, or both. Usually in habitats dominated by Acacias or Eucalypts on ranges, foothills and lowlands, and plains (Higgins & Peter 2002, cited in DCCEEW 2023b). Prefer low tree densities and herbaceous understorey / litter cover for foraging. Living and dead trees with hollows and crevices are used for roosting and nesting (DCCEEW 2023b).</p> <p>Recent BDBSA records within 5 km of (western end) and adjacent the PSL Area in Whyalla CP (14 spatially reliable, BDBSA 2023). 25 Birdlife records in total, but only 8 are spatially reliable (1999–2020) (BDBSA 2023). Of these records, there are several (from 2021 and 2023) within the PSL Area, east of Lincoln Highway/south of Port Bonython Road adjacent the salt pans (DEW 2024). Also detected in PSL Area by EBS (2023).</p> <p>There is suitable habitat in the PSL Area (Chenopod / Western Myall woodlands and Mallee / low woodlands).</p>
Flinders Ranges Worm Lizard	<i>Aprasia pseudopulchella</i>	VU	-	Unlikely	<p>PMST suggests likely in PSL Area.</p> <p>A very small, worm-like, burrowing lizard with no obvious external ear opening (Cogger 2000).</p> <p>It burrows freely in loose sand and soil, under rocks and litter. Occurs in open woodland, native tussock grassland, riparian habitats and rocky isolates. Prefers stony soils, or clay soils with a stony surface, and has been found sheltering beneath stones and rotting stumps.</p> <p>This species has a highly restricted distribution to the Mount Lofty Ranges, Mid North and Flinders Ranges in South Australia (ALA 2024).</p> <p>Records are geographically separate from the Project Area (ALA 2024). No records within 5 km of PSL Area (BDBSA 2023). An incorrect record that likely triggered the PMST output has recently been amended (DEW pers. com).</p>
Ruddy Turnstone	<i>Arearia interpres</i>	VU, MW	-	Unlikely	<p>PMST suggests known in PSL Area. <u>Newly listed as threatened species (Jan 2024)</u>.</p> <p>Breeds in Siberia and Alaska. When in Australia prefers rocky coastlines, coral and sand islands (Geering et al. 2008). The species is also strongly associated with beaches that have large expanses of rotting seaweed and will roost nearby in a range of habitats including low saltmarsh (DCCEEW 2024c). In southern Australia they prefer rockier coastlines and occur in fewer numbers on extensive mudflats (DCCEEW 2024c).</p> <p>Range includes coastline of Australia except Great Australian Bight (Davies et al. 2022).</p> <p>One previous record within PSL Area (1998) at Point Lowly, (BDBSA 2023). Historical and recent (2021) records at adjacent salt pans (ALA 2023). This species is unlikely to occur in the Project Area or PSL Area, given intertidal mudflats and saltmarsh areas are avoided, but has the potential to occur adjacent the Project Area and PSL Area at False Bay Beaches 350 m south of Port Bonython Road or roosting in samphire/saltmarsh.</p>
Sharp-tailed Sandpiper	<i>Calidris acuminata</i>	VU, MW	-	Unlikely in PSL Area / Known in adjacent Whyalla Saltfields / Possible in salt pans / claypans holding water	<p>PMST suggest known in PSL Area. <u>Newly listed as threatened species (Jan 2024)</u></p> <p>Migratory shorebird occurs widespread in Australian coastal and inland areas, but prefers non-tidal fresh or brackish wetlands, damp grasslands, will also utilise farms dams, wastewater irrigation areas, tidal flats, beaches (Geering et al. 2008, Menkhorst et al. 2017, ALA 2024, DCCEEW 2024e).</p> <p>Breeds in Siberia, migrates to New Guinea and Australia (summer), and small numbers to New Zealand (Geering et al. 2008, DCCEEW 2024e).</p> <p>One previous record (2019) at Whyalla salt pans, 7 records with low spatial reliability (BDBSA 2023). Several recent (2006, 2021) and historical records at Whyalla Salt pans (ALA 2023). The Whyalla Saltfields are listed in the directory as a known shorebird area, and include a population of Sharp-tailed Sandpiper (max 146, two surveys) (Weller et al. 2020). Species is unlikely to occur in the Project Area, given intertidal mudflats and saltmarsh areas are avoided, but known to occur adjacent the PSL Area at False Bay beaches >350 m south of Port Bonython Road or in samphire/saltmarsh areas in the PSL Area if holding water (e.g. in claypans following rainfall).</p>

Common Name	Scientific Name	AUS Status ¹	SA Status ²	Potential in PSL Area	Justification Comment ³
Red Knot	<i>Calidris canutus</i>	VU, MW	E (<i>ssp. rogersi</i>)	Unlikely in PSL Area / likely in adjacent False Bay beaches 350 m south of Port Bonython Road.	PMST suggests known in PSL Area. <u>Recent listing change from Critically Endangered to Vulnerable (Jan5 2024).</u> Migratory shorebird, which does not breed in Australia (breeds in Siberia). When in South Australia (Sept – April) occurs on extensive intertidal mud flats and rarely ventures inland (Geering et al. 2008, DCCEEW 2024d). No recent records within 5 km of the Project Area, 3 historical records with low spatially reliability (1983-1985, BDBSA 2023). Species could visit the adjacent evaporation ponds in False Bay, samphire shrubland areas in the PSL Area, particularly in following rainfall events / when in Aus.
Curlew Sandpiper	<i>Calidris ferruginea</i>	CE / MW	E	Unlikely in PSL Area / Known in adjacent Whyalla Saltfields / Possible in salt pans / claypans holding water.	PMST suggests known in PSL Area. Migratory species breeds in the high arctic tundra. When in Australia prefers exposed intertidal mudflats and less frequently inland freshwater / brackish wetlands (Geering et al. 2008, Menkhorst et al. 2017). Juveniles remain in Aus for first Austral Winter (2 years old) (Menkhorst et al. 2017). Several historical and recent BDBSA records (2, most recent from 2019) within 5 km of the Project Area in Whyalla salt pans / Saltworks (BDBSA 2023). Possible occurrence when in Australia, following rainfall events / where there is water present in the areas around the salt pans with muddy edges. Could visit the adjacent evaporation ponds in False Bay, samphire shrubland areas in the centre / west end of PSL Area, particularly in following rainfall events / when in Aus.
Great Knot	<i>Calidris tenuirostris</i>	VU, MW	E	Unlikely	PMST suggests known in PSL Area. <u>Recent listing change from Critically Endangered to Vulnerable (Jan5 2024).</u> Migratory shorebird that does not breed in Australia. Prefers sheltered coastal habitats, with large intertidal mudflats or sandflats, including natural environments along and close to the coast, and artificial environments such as ponds in saltworks (Geering et al. 2008; Menkhorst et al. 2017). No previous records within 5 km of the PSL Area (BDBSA 2023). Could visit the adjacent evaporation ponds in False Bay, samphire shrubland areas in the centre / west end of PSL Area, particularly in following rainfall events / when in Aus.
Greater Sand Plover	<i>Charadrius leschenaultia</i>	VU, MW	R (<i>ssp. leschenaultia</i>)	Unlikely	PMST suggests likely to occur in feature area. Early migratory bird that visits Australia (Aug-March) and remains in Aus for first austral winter. Occurs in tidal flats and roosts on beaches at high tide (Menkhorst et al. 2017, Geering et al. 2008). No recent records within 5 km of the Project Area, 2 historical (1983-1984) with low spatial reliability within 5 km of PSL Area (BDBSA 2023). Could visit the adjacent evaporation ponds in False Bay, samphire shrubland areas in the centre / west end of PSL Area, particularly in following rainfall events / when in Australia.
Grey Falcon	<i>Falco hypoleucos</i>	VU	R	Potential	PMST suggests known in feature area. Rarely encountered. Preferred habitat includes open plains and treed watercourses in arid inland areas. When not actively hunting roosts in shady trees or communications towers (Menkhorst et al. 2017). The species has a widespread distribution across Australia (ALA 2023). The PSL Area occurs in the species occasional range (Davies et al. 2022). No large treed watercourses present, but may forage widely, if present and feeds exclusively on other birds. One record within 5 km (2011, no spatial reliability, BDBSA 2023). Not detected in PSL Area or 5 km buffer to date. Possible as an occasional overfly visitor. No suitable nesting habitat present in PSL Area.
Latham's Snipe, Japanese Snipe	<i>Gallinago hardwickii</i>	VU, MW	R	Unlikely	PMST suggest may occur in PSL Area. <u>Recent listing as EPBC threatened (5 Jan 2023).</u> Breeds in Japan and Russia and migrates to south-eastern Australia via New Guinea and northern Australia (DCCEEW 2024g). In SA range includes southeast, Adelaide Plains, MLR and the lower EP (DCCEEW 2024g, ALA 2024). They prefer tussock grass and low dense sedges surrounding freshwater wetland, permanent and ephemeral wetlands. Can also occur in habitats with saline or brackish water in modified or artificial wetlands. The PSL Area is generally outside the known core range in Australia, in SA range includes South East, not EP (Menkhorst et al. 2017, Davies et al. 2022). No records within 5 km, no suitable habitat within or adjacent the Project Area or the PSL Area. Given lack of suitable habitat and records the species is considered unlikely to occur in the Project Area or PSL Area or adjacent areas.
Painted Honeyeater	<i>Grantiella picta</i>	VU	R	Unlikely	PMST suggests may occur in PSL Area. Endemic to mainland Australia, primarily occurring in Queensland, New South Wales and Victoria, occasionally in the Northern Territory and may be a vagrant to South Australia Occurs in dry open forests and woodlands (prefers Acacia woodland / <i>Allocasuarina</i> woodland) and is strongly associated with mistletoe. May also be found along rivers, on plains with scattered trees and on farmland with remnant vegetation. Rare throughout its range (Menkhorst et al. 2017). PSL Area occurs outside of species known range. No previous records within 5 km of the PSL Area (BDBSA 2023).

Common Name	Scientific Name	AUS Status ¹	SA Status ²	Potential in PSL Area	Justification Comment ³
Malleefowl	<i>Leipoa ocellata</i>	VU	V	Known	<p>PMST suggests known in PSL Area.</p> <p>Terrestrial ground-dwelling species which makes large conspicuous nesting mounds. Preferred habitat is semi-arid to arid shrublands and low woodlands (especially those dominated by mallee and/or Acacias). Sandy soils and abundance leaf litter are required for breeding.</p> <p>Three previous records (2019), within the PSL Area (BDBSA 2023). All in mallee / crossing Point Lowly Road. These records are contiguous with mallee woodland that extends for 2870 ha within DoD land north of the Project Area.</p> <p>The mallee areas within the PSL Area likely provide foraging and cover habitat for this species (see Figure 3.5). However, given the lack of deep sandy soils and the presence of limestone near the surface, closer to the highway the mallee within the PLS area does not provide optimal nesting habitat, primarily foraging habitat.</p> <p>Presence of this species (individuals, mounds) has not been detected during the surveys to date (e.g. March 2024 survey, Lathwida, refer Section 3.5).</p>
Nunivak Bar-tailed Godwit	<i>Limosa lapponica baueri</i>	VU, MW	R	Unlikely	<p>PMST suggests may occur in feature area. <u>Recent EPBC listing status change from Vulnerable to Endangered (Jan 5 2024).</u></p> <p>Three subspecies occur is Australia in total; the other two being are <i>L. l. anadyrensis</i> and <i>L. l. menzbieri</i> (DCCEEW 2024h). All of these large migratory shorebirds do not breed in Australia, but rather Siberia and Alaska (DCCEEW 2024h).</p> <p>When in Australia, the sub-species mainly occurs along the north and east coasts, in SA it mainly occurs form the coast near Lake Alexandrina (Coorong) to Denial Bay (past Ceduna) (DCCEEW 2024h), hence could occur near the Project Area. They prefer edges of water or water with shallow tidal estuaries, as well as intertidal sandflats and beaches (Geering et al. 2008, DCCEEW 2024h). There are no recent or spatially reliable records within 5 km of the Project Area (BDBSA 2023), but there are five historical records (1980s) from the 'Whyalla Saltfields' / False Bay. Hence potential suitable habitat occurs adjacent PSL Area in the Whyalla Saltfields and where the alignment runs along Port Bonython Road 350 m to coastal beaches at False Bay (only for < 1 km, buffered by coastal vegetation, mallee and existing road). The majority of records are from the eastern Australia, Coorong, Adelaide international bird sanctuary (ALA 2024).</p>
Hooded Robin (south eastern)	<i>Melanodryas cucullata cucullata</i>	EN	R	Unlikely	<p>PMST suggests may occur in buffer area only, i.e. 5 km from PSL Area boundary.</p> <p><u>Species was added to the threatened fauna list under the EPBC on 31 March 2023 (DCCEEW 2023d).</u></p> <p>Occurs in south-eastern Australia from far south-east Queensland to Yorke Peninsula, South Australia.</p> <p>Two previous records within 5 km of the Project Area, spatial reliability is uncertain.</p> <p>Project area occurs outside of the range of this subspecies, records are likely to be the common <i>M. c. westralensis</i>.</p>
Blue-winged Parrot	<i>Neophema chrystoma</i>	VU	V	Potential	<p>PMST suggests known in PSL Area.</p> <p>Suitable overwinter habitat present. Migratory parrot, recently EPBC listed (March 2023). Breeds in Tasmania and mainland Australia south of the Great Dividing Range in southern Victoria, and sometimes in the far south-east of South Australia.</p> <p>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 (Higgins 1999 cited in DCCEEW 2023c, Menkhorst et al. 2017).</p> <p>Inhabits a range of habitats from coastal, sub-coastal and inland areas, through to semi-arid zones. Favour grasslands and grassy woodlands and are often found near wetlands both near the coast and in semi-arid zones (Higgins 1999; Holdsworth et al. 2021 cited in DCCEEW 2023c). Also detected in altered environments such as airfields, golf-courses and paddocks. Will forage on saltmarsh (Davies at al 2022). The PSL Area occurs within the species occasional range.</p> <p>Woodland habitat with grassy understorey, saltmarsh and open chenopod areas may be suitable. This species was not observed during the surveys in the region to date, but was detected further north at Woomera and Carrapateena in 2023 (G. Smith, Z. Bull pers. obs.).</p> <p>No previous records within 5 km of the Project Area (BDBSA 2023).</p> <p>One record (2020) in the broader region (Fitzgerald Bay) (ALA 2024), suitable foraging habitat present.</p>
Eastern Curlew	<i>Numenius madagascariensis</i>	CE, MW	E	Unlikely	<p>PMST suggests known in PSL Area.</p> <p>Migratory wader / large shorebird. Breeds in NE Asia, Siberia and is a spring migrant to Australia where it is found in all states. Within Australia, has a primarily coastal distribution, with very few inland records. Its preferred habitat is coastal lakes, inlets, bays and estuaries where it occupies intertidal mudflats, particularly exposed seagrass beds (Geering et al. 2008, Menkhorst et al. 2017).</p> <p>Few historical records around Whyalla (1980s), records concentrated around coastal areas, known bird sanctuaries (ALA 2023). No suitable seagrass habitat in the PSL Area, but is present off the coast of False Bay Beaches. No BDBSA records within 5 km of PSL Area (BDBSA 2023), however one individual was recorded in 2023 Winter Birdlife surveys at the Whyalla Saltpans (Birdlife 2023). Hence this species is considered likely to occur adjacent the PSL Area in suitable coastal habitat.</p>
Plains-wanderer	<i>Pedionomus torquatus</i>	CE	E	Unlikely	<p>PMST suggests may occur in buffer area only, i.e. 5 km from boundary of PSL Area.</p> <p>Rare and elusive, prefers sparsely vegetated grasslands, PSL Area is well outside core range and occasional range (Menkhorst et al. 2017).</p> <p>Extensive grasslands unlikely in PSL Area, based on mapping and regional surveys. No records in Study Area (BDBSA 2023).</p>
Australian Painted Snipe	<i>Rostratula australis</i>	EN	E	Unlikely	<p>PMST suggests likely in PSL Area.</p> <p>Elusive bird occurs in freshwater wetland habitats with dense reeds and rushes/ well vegetated margins (Simpson and Day 2010, Menkhorst et al. 2017).</p> <p>Has a widespread distribution across eastern and northern Australia (ALA 2023).</p> <p>No previous records within Study Area (BDBSA 2023).</p> <p>No suitable habitat within the PSL Area.</p>

Common Name	Scientific Name	AUS Status ¹	SA Status ²	Potential in PSL Area	Justification Comment ³
Sandhill Dunnart	<i>Sminthopsis psammophila</i>	EN	E	Unlikely	PMST suggests likely in PSL Area. Large marsupial mouse. Occurs in sandy, arid and semi-arid areas, with specific habitat requirements that include spinifex hummocks. Restricted to EP and Great Victoria Desert. Nearest records to the PSL Area are in the Middleback ranges over 46 km west of the PSL Area. No records within Study Area (BDBSA 2023), no suitable habitat present.
Diamond Firetail	<i>Stagonopleura guttata</i>	VU	V	Unlikely	PMST suggested may occur within PSL Area. <u>Added to the threatened fauna list under the EPBC on 31 March 2023 (DCCEEW 2023e).</u> Occurs on the south-east mainland of Australia from south-east Queensland to southern Eyre Peninsula, South Australia, (Higgins et al. 2007, cited in DCCEEW 2023e, DEW 2024). Prefer drier Eucalypt, Acacia or Casuarina woodlands, open forests and other lightly timbered habitats, including farmland and grassland with scattered trees (Menkhorst et al. 2017, Higgins et al. 2007 cited in DCCEEW 2023e). They prefer areas with relatively low tree density, few large logs, and little litter cover but high grass cover, foraging mostly on the ground (DCCEEW 2023e, Menkhorst et al. 2017). No previous records within Study Area (BDBSA 2023). Nearest records are over 60 km south west of PSL Area and 30 km east across the Spencer Gulf (Nature Maps 2023). Woodland areas are present in the PSL Area but lack high grass cover. Has not been detected in surveys to date (Jacobs 2023a, 2023b, 2023c, EBS 2023, Lathwida 2024b).
Australian Fairy Tern	<i>Sternula nereis nereis</i>	VU	V	Unlikely in PSL Area, likely in adjacent saltpans, possible in stranded saltmarsh	PMST suggests known in PSL Area. Occurs along coasts and estuaries, and breeds on sandy beaches or spits (Simpson & Day 2019, TSSC 2011). Along the coast, this sub-species generally nests on sandy beaches and banks above the high tide line and below vegetation. Will roost on jetty structures. The sub-species' distribution extends along the coasts of South Australia, Tasmania, and central Western Australia, and there are a number of breeding sites along the EP, some near Coffin Bay, Port Lincoln and across the Gulf at the base of Yorke Peninsula (ALA 2023, DEW 2024). Previous records (2006, 2019) within 5 km of the PSL Area in the adjacent Whyalla salt evaporation pans / saltfields (BDBSA 2023). The species was also detected during winter surveys in 2023 (4 birds) (Birdlife 2023). The 'Whyalla Saltfields' are listed as coastal seabird site (population 11 to 50, breeding September to December) (DEW 2024). May occur in PSL Areas immediately adjacent Whyalla Saltfields, in open areas amongst stranded saltmarsh following rainfall, and on False Bay beaches. Species is considered unlikely in the PSL Area, but likely to occur adjacent the PSL Area.
Eastern Hooded Plover	<i>Thinornis cucullatus cucullatus</i>	VU	V	Unlikely in PSL Area, potential to occur in adjacent beach habitats and stranded saltmarsh	PMST suggests known in PSL Area. The sub-species mainly occurs on wide beaches backed by dunes, in creeks or inlet entrances. Known to occur on many South Australian beaches, including some with human activity / presence. In South Australia the coastlines of Kangaroo Island and Yorke Peninsula are considered important to the species. No previous spatially records within 5 km of the PSL Area (BDBSA 2023). May occur in PSL Areas immediately adjacent salt pans and open areas amongst stranded saltmarsh following rainfall, and beach habitats south of Port Bonython Road. Breeding territories and non-breeding flocking sites are of high conservation significance. This species is unlikely to occur in the PSL Area, but has the potential to occur in adjacent beach habitats south of Port Bonython Road.
Common Greenshank	<i>Tringa nebularia</i>	EN, MW	-	Unlikely	PMST output suggests species or species habitat is known to occur in the PSL Area (Appendix A). <u>Newly listed as an EPBC listed threatened species (5 Jan 2023).</u> Migratory shorebird, that has extensive breeding grounds in Europe / Siberia (DCCEEW 2024i). Has a widespread distribution throughout Australia, in summer (Geering et al. 2008, ALA 2023, DCCEEW 2024i). The species arrives in Australia from Aug to Oct / Nov (Menkhorst 2017). Occurs throughout most of eastern SA, including a few records in the Flinders Ranges and further inland (DCCEEW 204i). Occurs in all types of wetlands (fresh and saltwater) along the coast or inland as well as intertidal mudflats, in locations near mangroves, saltmarsh and or with fringing sedges (Geering et al. 2008, DCCEEW 2024i). Also occupies artificial habitats, and will also forage on seagrass wrack on beaches. There are previous records (1998,2006, 2017, 2019) within 5 km of the PSL Area in Whyalla salt evaporation pans (BDBSA 2023, ALA 2024). Known to occur in adjacent Whyalla Saltfields. Species has potential to occur adjacent the PSL Area, immediately adjacent salt pans and open areas amongst stranded saltmarsh following rainfall.

¹EPBC Act status: Threatened - Critically Endangered (CE), Endangered (EN), Vulnerable (VU); Migratory – Migratory Terrestrial (MT), Migratory Wetland (MW).

²South Australian National Parks and Wildlife Act 1972 status: Endangered (E); Vulnerable (V); Rare (R).

³Records from Biological Databases of SA (BDSA 2023) (Record set number: DEWNRBDBSA231020-1, within 5 km, post-1995, <1 km spatial reliability unless otherwise stated). BDBSA 2023 extract includes birdlife data, but does not consider any overlap with BSBSA records; only records with spatial reliability <1 km considered.

NPW listed fauna

In addition to the EPBC listed species that also have state ratings from Table 3.17 and Table 3.19, 27 additional state rated species have records within the Study Area (Table 3.18). A likelihood of occurrence for state listed species is considered as part of the vegetation impact assessment. All such species with records within the Study Area (e.g. for BAM assessment), post 1995, with spatial reliability <1 km and with suitable habitat within the Disturbance Footprint, would be incorporated into BAM sheets and contribute to conservation score, UBS and ultimately offsets for any approved impacts to native vegetation.

Table 3.18: SA listed Fauna records within Study Area

Common Name	Scientific Name	SA Status ¹	Potential in PSL Area	Records within 5 km of PSL Area (spatially reliable <1 km) ²
Australian Darter	<i>Anhinga novaehollandiae novaehollandiae</i>	R	Possible in aquatic habitats	1 record (2009)
Banded Stilt	<i>Cladorhynchus leucocephalus</i>	V	Known in adjacent aquatic areas	4 records (2015-2019). Recorded July 2023 in Winter Shorebird Survey of Whyalla Saltworks (Birdlife Australia 2023).
Chestnut-rumped Heathwren	<i>Hylacola pyrrhopygia</i>	Ssp. V	Unlikely	3 records (2021) likely for ssp. <i>H. p. pedleri</i> (Flinders Ranges). Records from Cultana / CUTA, more likely to be Shy Heathwren. Occurs in heath. Only MLR subspecies <i>H. p. parkeri</i> has EPBC listing.
Common Tern	<i>Sterna hirundo longipennis</i>	R	Likely	1 record (2000), in saltworks
Eastern Cattle Egret	<i>Bubulcus ibis coromandus</i>	R	Possible	2 records (2016-2019)
Elegant Parrot	<i>Neophema elegans elegans</i>	R	Likely	Not in BDBSA, but recorded by Jacobs (Jacobs 2023a)
Freckled Duck	<i>Stictonetta naevosa</i>	V	Possible in aquatic habitats	8 records (2017-2018)
Gilbert's Whistler	<i>Pachycephala inornata</i>	R	Possible in mallee habitats	1 record (2020)
Great Crested Grebe	<i>Podiceps cristatus australis</i>	R	Possible in aquatic habitats	2 records (2016-2019)
Grey Currawong	<i>Strepera versicolor plumbea</i>	Ssp. E	Unlikely	Records for common subspecies <i>S. v. intermedia</i> at this location
Jacky Winter	<i>Microeca fascians fascians</i>	Ssp. R	Unlikely	Records for common subspecies <i>M.f. assimilis</i> at this location
Lesser Sand Plover	<i>Charadrius mongolus mongolus</i>	E	Possible in aquatic habitats	1 historical record < 1995 (1973)
Little Eagle	<i>Hieraaetus morphnoides</i>	V	Possible as overfly species	1 record (2008), Port Bonython
Little Egret	<i>Egretta garzetta nigripes</i>	R	Likely in aquatic habitats	12 records (2000-2019) records at Whyalla salt pans. 10 recorded July 2023 in Winter Shorebird Survey of Whyalla Saltworks (Birdlife Australia 2023).
Musk Duck	<i>Biziura lobata menziesi</i>	R	Known in adjacent aquatic habitats	4 records (2000-2018), Whyalla saltworks / wetlands. Recorded July 2023 in Winter Shorebird Survey of Whyalla Saltworks (Birdlife Australia 2023).
Naretha Bluebonnet	<i>Northiella narethae</i>	Spp. R	Unlikely	Records for common subspecies <i>Northiella haematogaster</i> at this location.

Common Name	Scientific Name	SA Status ¹	Potential in PSL Area	Records within 5 km of PSL Area (spatially reliable <1 km) ²
Pacific Reef Heron	<i>Egretta sacra sacra</i>	R	Possible in aquatic habitats	2 records (2002-2006), Port Bonython
Peregrine Falcon	<i>Falco peregrinus macropus</i>	R	Likely as overfly species	2 records (2018-2019)
Pied Oystercatcher	<i>Haematopus longirostris</i>	R	Possible in beach habitats	8 historical record (1981-1984), low spatial reliability, but location recorded was Whyalla Saltfields. 4 recent records (1998-2014), low spatial reliability, but location was Port Bonython, Fitzgerald Bay, Pacific Saltworks
Rock Parrot	<i>Neophema petrophila zietzi</i>	R	Likely	1 Birdlife record (2011), low spatial reliability, but location Whyalla CP. ALA record (2022) from False Bay, near RAM01. Suitable habitat present.
Slender-billed Thornbill (Western)	<i>Acanthiza iredalei iredalei</i>	Ssp. R	Known	13 records (2011-2021), Whyalla CP, Cultana. EPBC listed subspecies do not occur at this location.
Shy Heathwren	<i>Hylacola cauta cauta</i>	Ssp. R	Likely in mallee habitats	3 records (2021) likely <i>H. c. cauta</i> at this location SA Rare. EPBC listed ssp. occur on KI (<i>H. cauta halmaturina</i>). Chestnut-rumped Heathwren records are more likely to be Shy Heathwren at this location.
Sooty Oystercatcher	<i>Haematopus fuliginosus fuliginosus</i>	R	Likely	2 records (1999, 2013). Recorded July 2023 in Winter Shorebird Survey of Whyalla Saltworks (Birdlife Australia 2023).
Spotless Crake	<i>Zapornia tabuensis</i>	R	Likely	2 records (2006, 2019), Whyalla salt pans / wetlands. Australian Spotted Crake recorded in July 2023 (Birdlife Australia 2023).
Whimbrel	<i>Numenius phaeopus variegatus</i>	R	Unlikely	1 historical record (1973), Whyalla saltfield
White-bellied Sea Eagle	<i>Haliaeetus leucogaster</i>	E	Possible as overfly species	2 records (2000, 2016), Whyalla saltworks
Wood Sandpiper	<i>Tringa glareola</i>	R	Unlikely	2 records (2019, Whyalla wetlands)

¹South Australian National Parks and Wildlife Act 1972 status: Endangered (E); Vulnerable (V); Rare (R).

²Records from Biological Databases of SA (BDSA 2023) (Recordset number: DEWNRBDBSA231020-1, within 5 km, post 1995, < 1 km spatial reliability unless otherwise stated). BDBSA 2023 extract includes birdlife data, but does not consider any overlap with BSBSA records; only records with spatial reliability <1 km considered.

3.6.3 Migratory Fauna

The PMST highlighted 45 migratory species, of which twenty three oceanic / marine species were not considered further (e.g. 5 marine mammals, 3 marine reptiles, 2 sharks, shearwaters, petrels and albatrosses). Of the twenty two migratory species considered to potentially occur in the Study Area, nine species were already discussed in the threatened fauna Table 3.15 above; Common Greenshank, Curlew Sandpiper, Eastern Curlew, Great Knot, Greater Sand Plover, Latham's Snipe, Ruddy Turnstone, Red Knot and Sharp-tailed Sandpiper. Of the remaining twelve species, one is known (Fork-tailed Swift), but is an overfly species, four are considered unlikely in the PSL Area, but may occur in immediately adjacent stranded saltmarsh areas if there is low lying water present (e.g. Common Sandpiper, Pectoral Sandpiper, Reck-neck Stint, Marsh Sandpiper) and seven are considered unlikely. The majority of these migratory species are only likely to be present in summer, and when water is present in areas adjacent the salt pans that fall within the PSL Area.

Table 3.19: EPBC Migratory Species Likelihood of Occurrence in PSL Area

Common Name	Scientific Name	AUS Status ¹	SA Status ²	Potential in PSL Area	Justification Comment
Common Sandpiper	<i>Actitis hypoleucos</i>	MW	R	Unlikely in PSL Area, likely in adjacent salt pans / samphire areas following rainfall	PMST suggests known in PSL Area. Migratory shorebird occurs in a variety of habitats, including a wide range of coastal and inland wetlands with varying levels of salinity. It is mostly found around muddy margins or rocky shores and rarely on intertidal mudflats. Also occurs on steep sided sewage ponds, dams, muddy habitats, the shallow edges of inland farm dams, and mangrove-lined inlets. Suitable habitat in PSL Area, adjacent evaporation ponds and in open samphire areas / blowouts following rainfall. 7 records (2006–2019), includes records in saltpans (BDBSA 2023).
Fork-tailed Swift	<i>Apus pacificus</i>	MM	-	Known as overfly species.	PMST suggests likely in PSL Area. Highly mobile species, almost entirely aerial, and rarely recorded on the ground. Has a widespread distribution across Australia, in summer (ALA 2023). No previous records within Study Area (BDBSA 2023). However, a flock of 200+ was detected flying >200 m above mallee in the Project Area during Lathwida Survey 2 (Section 3.5). Unlikely to occur on or near vegetation within the PSL Area.
Sanderling	<i>Calidris alba</i>	MW	R	Unlikely	PMST suggests likely in PSL Area. Migrant, breeds in high Arctic tundra of Asia and North America, migrates to a number of countries including Australia (Geering et al. 2008). Prefers ocean beaches and occasionally sandy / intertidal mudflats (Menkhorst et al. 2008). No BDBSA records within Study Area, but records (2021, 2022), nearby at Port Bonython (ALA 2023). Likely in adjacent beach areas.
Pectoral Sandpiper	<i>Calidris melanotos</i>	MW	R	Unlikely in PSL Area, likely in adjacent salt pans / samphire areas following rainfall	PMST suggests known in PSL Area. Migratory shorebird occurs in freshwater (preferred) or brackish wetlands, grassy or lightly vegetated coastal and inland swamps (Geering et al. 2008). Uses brackish wetlands with low saltmarsh fringes, when no freshwater is available (Menkhorst et al. 2017). Is widespread across southeast Australia (ALA 2023). Usually occurs solitarily or in small flocks, range does not include inland South Australia (Geering et al. 2008; Menkhorst et al. 2017). No BDBSA records within Study Area, no suitable habitat in PSL Area. Low potential to occur in stranded saltmarsh areas following rainfall, if present in Australia.
Red-necked Stint	<i>Calidris ruficollis</i>	MW	-	Unlikely in PSL Area, likely in adjacent salt pans / samphire areas following rainfall	PMST suggests known in PSL Area. Migrant from Siberia, in Aus August to Nov. Primarily occurs on tidal flats, but also uses open beaches (with seagrass wrack); will occur in a range of sparsely vegetated brackish and freshwater inland with muddy / sandy areas for foraging (Menkhorst et al. 2017). Multiple records within Study Area, in saltpans. Unlikely in PSL Area, but may occur in areas adjacent saltpans, particularly following rainfall / where water is present (ALA 2024, BDBSA 2023).
Oriental Plover, Oriental Dotterel	<i>Charadrius veredus</i>	MW	-	Unlikely	PMST suggests may occur in PSL Area. Nests in arid inland of China and Mongolia, but has non-breeding stronghold in Aus. Early Aus migrant (Aug-Sep to Feb (Menkhorst et al. 2017). Occurs on grasslands, thinly vegetated plains, open areas, recently burned areas, heavily grazed pasture. Will also occur on wet ground associated with wetlands / beaches. No previous records within Study Area (ALA 2024, BDBSA 2023).
Pin-tailed Snipe	<i>Gallinago stenura</i>	MW	-	Does not occur	PMST suggest known in PSL Area. Uncommon, elusive migratory species, that does not breed in Australia (Geering et al. 2008). Occur in freshwater wetlands of coastal plains of northern Western Australia and Northern Territory (Menkhorst et al. 2017, Davies et al. 2022). Study Area is outside of known range. No records within Study Area, no suitable habitat (BDBSA 2023).
Bar-tailed Godwit	<i>Limosa lapponica</i>	MW	-	Unlikely in PSL Area, possible on nearby tidal flats.	PMST suggests known in PSL Area. Three subspecies occur is Australia; <i>Limosa lapponica baueri</i> (Endangered, discussed in Section 3.6.2), <i>L. l. anadyrensis</i> and <i>L. l. menzbieri</i> (DCCEEW 2024c). All of these large migratory shorebirds do not breed in Australia, but rather Siberia and Alaska (DCCEEW 2024c). In Australia, large concentrations are restricted to coastal locations with extensive tidal flats. Historical records in the Study Area, unlikely to occur in the Project Area
Grey Wagtail	<i>Motacilla cinerea</i>	MT	-	Unlikely	PMST suggest may occur in PSL Area. Uncommon migratory wagtail favours fast-flowing streams and rivers often in forested areas, in addition to lowland watercourses (ebird 2023, CoA 2015). Occasionally occurs in waterfalls, fast flowing rocky waterways of Nth Australia (Kimberlys, WA, NT, Wet Tropics). Known range is considered to be northern coastal Australia, rarely SA (Davies et al. 2022, CoA 2015). No records within Study Area (BDBSA 2023), no suitable habitat.

Common Name	Scientific Name	AUS Status ¹	SA Status ²	Potential in PSL Area	Justification Comment
Yellow Wagtail	<i>Motacilla flava</i>	MT	-	Unlikely	PMST suggest may occur in PSL Area. Uncommon migratory wagtail. Occurs in a variety of damp or wet habitats including marshes and bogs (eBird 2023). Forages in damp grassland or on bare ground at the edge of rivers, lakes and other wetlands, can roost in Mangroves (CoA 2015). This species has a distribution around the coast of Australia, rarely from SA (CoA 2015, ALA 2023). No records within Study Area (BDBSA 2023), no suitable habitat.
Osprey	<i>Pandion haliaetus</i>	MW	E	Unlikely	PMST suggest known in PSL Area. Large coastal fish-eating raptor. Ranges around all coastal areas of Australia, also occurs around the world. Nests on coastal cliffs in SA, but also known to use artificial substrates, transmission line towers, utility poles, boat masts in marinas (Menkhorst et al. 2017, ebird 2023). No records within Study Area (BDBSA 2023). No known nests detected during surveys to date. Suitable foraging habitat does not occur within the PSL Area.
Ruff (Reeve)	<i>Philomachus pugnax</i>	MW	R	Unlikely	PMST suggest known in PSL Area. Breeds in Europe / Siberia, rare but regular annual migrant to Aus (Geerling et al. 2008). Occurs in variety of open moist habitats, grasslands and agricultural lands, but muddy edge of freshwater wetland habitats are preferred. Will also occur at brackish swamps, sewage farms, saltworks (Menkhorst et al. 2017). Known range includes Eastern NSW through Vic, Lower SE SA to Yorke Peninsula, EP near Whyalla, excludes inland SA (Davies et al 2022). ALA records with spatial uncertainty in PSL Area (ALA 2023). Two historical BDBSA records (1978, 1981), 1 has poor spatial reliability (BDBSA 2023), Whyalla Saltfields, suitable habitat immediately adjacent salt pans.
Marsh Sandpiper, Little Greenshank	<i>Tringa stagnatilis</i>	MW	-	Unlikely in PSL Area, likely in adjacent salt pans / samphire areas following rainfall	PMST suggest known in PSL Area. Migrant, breeds in N Hemisphere, Arrives in Australia Sep / Nov (Geering et al. 2008, Menkhorst et al. 2017). Range includes Eastern and northern half of, Australia, and coastal areas of the Study Area (Menkhorst et al. 2017, Davies et al. 2022). Prefer shallow fresh or brackish inland wetlands, also on tidal flats when arrives (Menkhorst et al 2017). Recent (2000, 2017) and historical (1983) records within /adjacent PSL Area around salt pans (ALA 2023, BDBSA 2023). Likely to occur following rainfall in areas immediately adjacent salt pans.

¹EPBC Act status: Endangered (EN); Vulnerable (VU).

²SA NPW Act 1972 status: Endangered (E); Vulnerable (V); Rare (R).

³Records from Biological Databases of SA (BDBSA 2023). Recordset number: 231020-1, recent (since 1995) and reliable (<1 km) records included, unless stated otherwise, includes Birdlife SA records.



Figure 3.8: Key threatened and migratory species records relative to the PSL Area

4 Summary

The outcomes of the desktop assessment provide summary information about the existing environment of the Study Area. This information is combined with the outcomes of three field surveys (December 2023, March 2024 and August 2024) to inform the likelihood of occurrence of threatened species within the PSL Area (and ultimately the Project Area) and proposed Disturbance Footprint. The field surveys included vegetation assessments, using BAM, as required by the NV Act and Regulations (NVC 2024b), targeted Western Grasswren surveys and targeted searches for Malleefowl nesting mounds.

Broadly the PSL Area comprises five vegetation groups; mallee, acacia woodland, samphire shrublands, chenopod shrublands and coastal shrublands. Whilst detailed vegetation assessment already exists west of the Lincoln Highway (Jacobs 2023a), there were gaps within the portion of the PSL Area east of Lincoln Highway, where the majority of the Project Area and disturbance is proposed for the WHP project. Within the Project Area, sixteen BAMs sites were used to describe the following vegetation communities:

- Mallee and low woodlands with open sclerophyll shrub over Chenopods on sand plains / low dunes over calcareous loams, including vegetation associations such as Red Mallee low woodland, False Sandalwood +/- Red Mallee over chenopod shrubland and Open Red Mallee +/- False Sandalwood / Bullock Bush over Bluebush Daisy and Chenopod and Red Mallee low woodland.
- Low open woodlands of Western Myall +/- Black Oak over Chenopods, including vegetation associations such as Western Myall over Black Bluebush, Pearl Bluebush and Bladder Saltbush on loamy plains; Western Myall / Black Oak over Pearl Bluebush, Black Bluebush, Bladder Saltbush shrubland.
- Samphire +/- Chenopod shrublands with infrequent inundation/saline soils, including vegetation associations such as Samphire / Mallee Hemichroa low shrubland on saline soils.
- Low Open Chenopod Shrublands, including vegetation associations such as Black Bluebush / Bladder Saltbush low shrubland
- Coastal Shrublands including vegetation associations such as tall sclerophyll shrubland on sand.

The sixteen BAM sites, along with 52 'Vegetation Check' points were used to update the vegetation mapping for the PSL Area, in particular areas that had not been ground-truthed as part of other survey for the broader HJP Project.

The targeted Western Grasswren survey effort included over 192 hours of Song Meter effort, as well as 21 hours of bird survey at the deploy sites, this also included detection for Southern Whiteface. Western Grasswren were detected at three of the four deploy site, east of Lincoln Highway, and one site along Port Bonython Road. One individual was also briefly observed in vegetation on the south side of Fitzgerald Bay Road that will be avoided by the Project. It is noted that EBS (2023) also detected Western Grasswren in the vicinity of the fourth Song Meter site east of Lincoln Highway. The targeted Malleefowl mound searches did not detect any evidence of the species but refined the area of suitable habitat (primarily foraging) within and adjacent the proposed disturbance area. The survey effort for these species exceeded the requirements of the National threatened bird survey guidelines (DEWHA 2010).

The outcomes of the EPBC Act PMST suggested one TEC, 50 threatened species and 45 migratory species have potential to occur in the Study Area. The findings of the likelihood assessment concluded the following:

- One Vulnerable TEC (*Subtropical and Temperate Coastal Saltmarsh* (Vulnerable) occurs adjacent the PSL Area (south of the Whyalla Salt pans / saltfields / evaporation pans). The majority is distant from the Project Area. A small area of Saltmarsh / Chenopod vegetation that occurs in areas with infrequent inundation occurs in the centre of the Project Area, with only 2.8 ha within the Disturbance Footprint.
- Three Nationally threatened flora species are considered unlikely to occur in the PSL Area, and two species have potential to occur in the PSL Area / Project Area; Yellow Swainson-pea (*Swainsona pyrophila*) in mallee habitats and Bead Samphire (*Tecticornia flabelliformis*) (in samphire habitats). Although the Bead Samphire was not suggested by the EPBC PMST and is more likely to occur in areas that represent the Saltmarsh TEC and have tidal connection, rather than the small areas (2.8 ha) of stranded / infrequently inundated saltmarsh that overlap with the Project Area.
- Whilst the PMST suggested 46 threatened fauna have potential to occur, 22 marine and oceanic species were not considered further. Of the 24 threatened fauna considered (22 birds, one mammal and one reptile), three are known in the PSL Area / Project Area (Western Grasswren, Malleefowl, Southern Whiteface) and two have potential to occur (Blue-wing Parrot, Grey Falcon). The remaining nineteen species are considered unlikely, however ten of these are shorebirds that have potential to occur or are known to visit the adjacent saltfields / salt evaporation pans (Ruddy Turnstone, Sharp-tailed Sandpiper, Red Knot, Curlew Sandpiper, Great Knot, Greater Sand Plover, Eastern Curlew, Eastern Hooded Plover, Fairy Tern and Common Greenshank). Some of these species may also occur in stranded saltmarsh / samphire areas following rainfall.
- There are records for five state-listed flora, three are considered unlikely to occur and two are considered likely; Sandalwood (*Santalum spicatum*) and Australian Broomrape (*Orobancha cernua* var. *australiana*) but have not been detected within the Disturbance Footprint to date.
- There are records for an additional 27 state-listed fauna within the Study Area. Several of these species are considered unlikely given lack of suitable habitat or records are more likely for the common species and rated species do not occur in the location of the PSL Area. A number of aquatic / aquatic species are more likely to occur in the saltfields adjacent the PSL Area, and are unlikely in the Project Area.
- There are existing records for 20 exotic flora and 11 exotic fauna in the Study Area. Nineteen of the flora species are Declared under the Landscape Act SA and seven of these are also Weeds of National Significance (WoNS). A number of these species were detected during field assessments of the PSL Area / Project Area; Horehound (Declared), Prickly Pear and African Boxthorn (both Declared and WoNS). A European Fox and evidence of European Rabbit was also detected during the surveys.
- Preliminary information is provided that will inform native vegetation clearance offset requirements under the NVC Significant Environmental Benefit Offset Policy (NVC 2024c, 2024d).



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Appendices

Appendix A. PMST January 2024



Australian Government

Department of Climate Change, Energy,
the Environment and Water

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: 31-Jan-2024

[Summary](#)

[Details](#)

[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)

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:	None
Listed Threatened Ecological Communities:	1
Listed Threatened Species:	50
Listed Migratory Species:	45

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:	11
Commonwealth Heritage Places:	None
Listed Marine Species:	81
Whales and Other Cetaceans:	8
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:	3
Regional Forest Agreements:	None
Nationally Important Wetlands:	1
EPBC Act Referrals:	12
Key Ecological Features (Marine):	None
Biologically Important Areas:	3
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
Natural			
Cuttlefish Coast Sanctuary Zone	SA	Listed place	In feature area

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
Subtropical and Temperate Coastal Saltmarsh	Vulnerable	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			
Amytornis textilis myall			
Western Grasswren (Gawler Ranges) [64454]	Vulnerable	Species or species habitat known to occur within area	In feature area
Aphelocephala leucopsis			
Southern Whiteface [529]	Vulnerable	Species or species habitat known to occur within area	In feature area
Ardenna grisea			
Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area	In feature area
Arenaria interpres			
Ruddy Turnstone [872]	Vulnerable	Species or species habitat known to occur within area	In feature area
Calidris acuminata			
Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Calidris tenuirostris Great Knot [862]	Vulnerable	Species or species habitat known to occur within area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	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	Species or species habitat may 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
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat known to occur within area	In feature area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat may occur within area	In feature area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat may occur within area	In feature area
Leipoa ocellata Malleefowl [934]	Vulnerable	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Limosa lapponica baueri Nunivak Bar-tailed Godwit, Western Alaskan Bar-tailed Godwit [86380]	Endangered	Species or species habitat may occur within area	In feature area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may 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
Melanodryas cucullata cucullata South-eastern Hooded Robin, Hooded Robin (south-eastern) [67093]	Endangered	Species or species habitat may occur within area	In buffer area only
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat known to occur within area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	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
Pedionomus torquatus Plains-wanderer [906]	Critically Endangered	Species or species habitat may occur within area	In feature area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area	In feature area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area	In feature area
Stagonopleura guttata Diamond Firetail [59398]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Species or species habitat known 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 impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may 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 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
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area	In feature area
FISH			
Seriolella brama Blue Warehou [69374]	Conservation Dependent	Species or species habitat likely 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			

Scientific Name	Threatened Category	Presence Text	Buffer Status
Eubalaena australis Southern Right Whale [40]	Endangered	Breeding known to occur within area	In feature area
Neophoca cinerea Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat may occur within area	In feature area
Sminthopsis psammophila Sandhill Dunnart [291]	Endangered	Species or species habitat likely to occur within area	In feature area
PLANT			
Caladenia tensa Greencomb Spider-orchid, Rigid Spider-orchid [24390]	Endangered	Species or species habitat may occur within area	In feature area
Frankenia plicata [4225]	Endangered	Species or species habitat may occur within area	In feature area
Pterostylis xerophila Desert Greenhood [7997]	Vulnerable	Species or species habitat may occur within area	In feature area
Swainsona pyrophila Yellow Swainson-pea [56344]	Vulnerable	Species or species habitat may occur within area	In feature area
REPTILE			
Aprasia pseudopulchella Flinders Ranges Worm-lizard [1666]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area	In feature area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area	In feature area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area	In feature area
SHARK			

Scientific Name	Threatened Category	Presence Text	Buffer Status
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 buffer area only

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]	Vulnerable	Species or species habitat may 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	Species or species habitat may 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
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may 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 may 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 impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may 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 steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
Migratory Marine Species			
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area	In feature area
Caperea marginata Pygmy Right Whale [39]		Species or species habitat 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
Caretta caretta Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area	In feature area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area	In feature area
Eubalaena australis as Balaena glacialis australis Southern Right Whale [40]	Endangered	Breeding 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 may occur within area	In feature area
Migratory Terrestrial Species			
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area	In feature area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area	In feature area
Migratory Wetlands Species			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area
Arenaria interpres Ruddy Turnstone [872]	Vulnerable	Species or species habitat known to occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris alba Sanderling [875]		Species or species habitat likely to occur within area	In feature area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area	In feature area
Calidris ruficollis Red-necked Stint [860]		Species or species habitat known to occur within area	In feature area
Calidris tenuirostris Great Knot [862]	Vulnerable	Species or species habitat known to occur within area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Charadrius veredus Oriental Plover, Oriental Dotterel [882]		Species or species habitat may occur within area	In feature area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat may occur within area	In feature area
Gallinago stenura Pin-tailed Snipe [841]		Species or species habitat known to occur within area	In feature area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area	In buffer area only
Philomachus pugnax Ruff (Reeve) [850]		Species or species habitat known to occur within area	In feature area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area	In feature area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Species or species habitat known to occur within area	In feature area

Other Matters Protected by the EPBC Act

Commonwealth Lands

[[Resource Information](#)]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Commonwealth Land Name	State	Buffer Status
Defence		
Defence - AIRTC WHYALLA [40170]	SA	In buffer area only
Defence - CULTANA TRAINING AREA [40106]	SA	In feature area
Defence - CULTANA TRAINING AREA [40103]	SA	In buffer area only
Defence - CULTANA TRAINING AREA [40104]	SA	In buffer area only
Defence - EL ALAMEIN - PORT AUGUSTA [40105]	SA	In buffer area only
Defence - WHYALLA TRAINING DEPOT [40171]	SA	In buffer area only
Defence - WHYALLA TRAINING DEPOT [40172]	SA	In buffer area only

Transport and Regional Services - Australian National Railways Commission		
Commonwealth Land - Australian National Railways Commission [41425]	SA	In buffer area only
Commonwealth Land - Australian National Railways Commission [41565]	SA	In feature area

Commonwealth Land Name		State	Buffer Status
Commonwealth Land - Australian National Railways Commission [40934]		SA	In feature area
Unknown			
Commonwealth Land - [40927]		SA	In buffer area only
Listed Marine Species		[Resource Information]	
Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to 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]	Vulnerable	Species or species habitat may occur within area	In feature area
Arenaria interpres Ruddy Turnstone [872]	Vulnerable	Species or species habitat known 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]	Vulnerable	Species or species habitat known to occur within area	In feature area
Calidris alba Sanderling [875]		Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area overfly marine area	In feature area
Calidris ruficollis Red-necked Stint [860]		Species or species habitat known to occur within area overfly marine area	In feature area
Calidris tenuirostris Great Knot [862]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area
Chalcites osculans as Chrysococcyx osculans Black-eared Cuckoo [83425]		Species or species habitat known to occur within area overfly marine area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Charadrius ruficapillus Red-capped Plover [881]		Species or species habitat known to occur within area overfly marine area	In feature area
Charadrius veredus Oriental Plover, Oriental Dotterel [882]		Species or species habitat may occur within area overfly marine area	In feature area

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 epomophora Southern Royal Albatross [89221]	Vulnerable	Species or species habitat may 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
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat may occur within area overfly marine area	In feature area
Gallinago stenura Pin-tailed Snipe [841]		Species or species habitat known to occur within area overfly marine area	In feature area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area	In feature area
Himantopus himantopus Pied Stilt, Black-winged Stilt [870]		Species or species habitat known to occur within area overfly marine area	In feature area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In feature area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may 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
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area overfly marine area	In feature area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may 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
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Onychoprion fuscatus as Sterna fuscata Sooty Tern [90682]		Breeding known to occur within area	In feature area
Pachyptila turtur Fairy Prion [1066]		Species or species habitat likely to occur within area	In feature area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area	In buffer area only
Phalacrocorax fuscescens Black-faced Cormorant [59660]		Foraging, feeding or related behaviour likely to occur within area	In feature area
Philomachus pugnax Ruff (Reeve) [850]		Species or species habitat known to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area	In feature area
Recurvirostra novaehollandiae Red-necked Avocet [871]		Species or species habitat known to occur within area overfly marine area	In feature area
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area overfly marine area	In feature area
Sterna striata White-fronted Tern [799]		Migration route may occur within area	In feature area
Sternula nereis as Sterna nereis Fairy Tern [82949]		Breeding known 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 impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may 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 steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
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
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
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Species or species habitat known to occur within area overfly marine area	In feature area
Fish			
Acentronura australe Southern Pygmy Pipehorse [66185]		Species or species habitat may occur within area	In feature area
Filicampus tigris Tiger Pipefish [66217]		Species or species habitat may occur within area	In feature area
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 breviceps Short-head Seahorse, Short-snouted Seahorse [66235]		Species or species habitat may occur within area	In feature area
Histiogamphelus cristatus Rhino Pipefish, Macleay's Crested Pipefish, Ring-back Pipefish [66243]		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

Scientific Name	Threatened Category	Presence Text	Buffer Status
Kaupus costatus Deepbody Pipefish, Deep-bodied Pipefish [66246]		Species or species habitat may occur within area	In feature area
Leptoichthys fistularius Brushtail Pipefish [66248]		Species or species habitat may occur within area	In feature area
Lissocampus caudalis Australian Smooth Pipefish, Smooth Pipefish [66249]		Species or species habitat may occur within area	In feature area
Lissocampus runa Javelin Pipefish [66251]		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
Notiocampus ruber Red Pipefish [66265]		Species or species habitat may occur within area	In feature area
Phycodurus eques Leafy Seadragon [66267]		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
Stigmatopora argus Spotted Pipefish, Gulf Pipefish, Peacock Pipefish [66276]		Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Stigmatopora nigra Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area	In feature area
Stipecampus cristatus Ringback Pipefish, Ring-backed Pipefish [66278]		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 margaritifer Mother-of-pearl Pipefish [66283]		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
Vanacampus vercoi Verco's Pipefish [66286]		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
Neophoca cinerea Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat may occur within area	In feature area
Reptile			
Caretta caretta Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area	In feature area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area	In feature area

Whales and Other Cetaceans		[Resource Information]	
Current Scientific Name	Status	Type of Presence	Buffer Status
Mammal			
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area	In feature area
Caperea marginata Pygmy Right Whale [39]		Species or species habitat 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	Breeding known to 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 may occur within area	In feature area
Tursiops aduncus Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area	In feature area
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
Unnamed (No.HA1588)	Heritage Agreement	SA	In feature area
Upper Spencer Gulf	Marine Park	SA	In feature area
Whyalla	Conservation Park	SA	In feature area

Nationally Important Wetlands		[Resource Information]
Wetland Name	State	Buffer Status
Upper Spencer Gulf	SA	In feature area

EPBC Act Referrals				[Resource Information]
Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Cultana Solar Farm project	2023/09658		Referral Decision	In feature area

Controlled action				
Arafura Whyalla Rare Earths Complex	2011/5877	Controlled Action	Completed	In feature area
Construction and operation of a coal storage facility	2001/463	Controlled Action	Completed	In feature area
Expansion of the Cultana Training Area	2010/5316	Controlled Action	Post-Approval	In feature area
Expansion of the Olympic Dam copper, uranium, gold and silver mine, processing plant and associated	2005/2270	Controlled Action	Post-Approval	In feature area
Pig Iron Smelter	2001/473	Controlled Action	Completed	In feature area
Pig Iron Smelter (Cultana)	2001/466	Controlled Action	Completed	In feature area
Port Bonython Bulk Commodities Export Facility, SA	2012/6336	Controlled Action	Final PD	In feature area
Not controlled action				
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area
Pilot desalination plant, Olympic Dam Expansion Project	2007/3391	Not Controlled Action	Completed	In feature area
Project Magnet	2004/1724	Not Controlled Action	Completed	In feature area

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action				
Whyalla Solar Farm Project, SA	2017/7910	Not Controlled Action	Completed	In feature area

Biologically Important Areas				
Scientific Name		Behaviour	Presence	Buffer Status
Seabirds				
Ardena tenuirostris				
Short-tailed Shearwater [82652]		Foraging (in high numbers)	Likely to occur	In feature area
Phalacrocorax fuscescens				
Black-faced Cormorant [59660]		Foraging	Known to occur	In feature area
Sternula nereis				
Fairy Tern [82949]		Foraging	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 B. Site Photolog



Appendix Figure B.1: BAM site LEEP1, facing north



Appendix Figure B.2: BAM site LEEP1, facing east



Appendix Figure B.3: BAM site LEEP1, facing south



Appendix Figure B.4: BAM site LEEP1, facing west



Appendix Figure B.5: BAM site LEEP2, facing north



Appendix Figure B.6: BAM site LEEP2, facing east



Appendix Figure B.7: BAM site LEEP2, Ward's Weed



Appendix Figure B.8: BAM site LEEP2, facing west



Appendix Figure B.9: BAM site LEEP3, facing north



Appendix Figure B.10: BAM site LEEP3, facing east



Appendix Figure B.11: BAM site LEEP3, facing south



Appendix Figure B.12: BAM site LEEP3, facing west



Appendix Figure B.13: BAM site LEEP4, facing north



Appendix Figure B.14: BAM site LEEP4, facing east



Appendix Figure B.15: BAM site LEEP4, facing south



Appendix Figure B.16: BAM site LEEP4, facing west



Appendix Figure B.17: BAM site LEEP5, facing north to Port Bonython Rd



Appendix Figure B.18: BAM site LEEP5, facing east



Appendix Figure B.19: BAM site LEEP5, facing south



Appendix Figure B.20: BAM site LEEP5, facing west



Appendix Figure B.21: BAM site LEEP6, facing north



Appendix Figure B.22: BAM site LEEP6, facing east



Appendix Figure B.23: BAM site LEEP6, facing south



Appendix Figure B.24: BAM site LEEP6, facing west



Appendix Figure B.25: LESM1 deployed



Appendix Figure B.26: LESM2 deployed



Appendix Figure B.27: LESM3 deployed



Appendix Figure B.28: LESM4 deployed



Appendix Figure B.29: BAM site LEEP7, facing north



Appendix Figure B.30: BAM site LEEP7, facing east



Appendix Figure B.31: BAM site LEEP7, facing south



Appendix Figure B.32: BAM site LEEP7, facing west



Appendix Figure B.33: BAM site LEEP8, facing north



Appendix Figure B.34: BAM site LEEP8, facing east



Appendix Figure B.35: BAM site LEEP8, facing south



Appendix Figure B.36: BAM site LEEP8, facing west



Appendix Figure B.37: BAM site LEEP9, facing north



Appendix Figure B.38: BAM site LEEP9, facing east



Appendix Figure B.39: BAM site LEEP9, facing south



Appendix Figure B.40: BAM site LEEP9, facing west



Appendix Figure B.41: BAM site LEEP10, facing north



Appendix Figure B.42: BAM site LEEP10, facing east



Appendix Figure B.43: BAM site LEEP10, facing south



Appendix Figure B.44: BAM site LEEP10, facing west



Appendix Figure B.45: BAM site LEEP11, facing north



Appendix Figure B.46: BAM site LEEP11, facing east



Appendix Figure B.47: BAM site LEEP11, facing south



Appendix Figure B.48: BAM site LEEP11, facing west



Appendix Figure B.49: BAM site LEEP12, facing north



Appendix Figure B.50: BAM site LEEP12, facing east



Appendix Figure B.51: BAM site LEEP12, facing south



Appendix Figure B.52: BAM site LEEP12, facing west



Appendix Figure B.53: BAM site LEEP13, facing north



Appendix Figure B.54: BAM site LEEP13, facing east



Appendix Figure B.55: BAM site LEEP13, facing south



Appendix Figure B.56: BAM site LEEP13, facing west



Appendix Figure B.57: BAM site LEEP14, facing north



Appendix Figure B.58: BAM site LEEP14, facing east



Appendix Figure B.59: BAM site LEEP14, facing south



Appendix Figure B.60: BAM site LEEP14, facing west



Appendix Figure B.61: BAM site LEEP15, facing north



Appendix Figure B.62: BAM site LEEP15, facing east



Appendix Figure B.63: BAM site LEEP15, facing south



Appendix Figure B.64: BAM site LEEP15, facing west



Appendix Figure B.65: BAM site LEEP16, facing north



Appendix Figure B.66: BAM site LEEP16, facing east



Appendix Figure B.67: BAM site LEEP16, facing south



Appendix Figure B.68: BAM site LEEP16, facing west



Appendix Figure B.69: LEVC1



Appendix Figure B.70: LEVC2 Black Oak



Appendix Figure B.71: LEVC2 False Sandalwood



Appendix Figure B.72: LEVC3



Appendix Figure B.73: LEVC4, facing north



Appendix Figure B.74: LEVC4, facing south



Appendix Figure B.75: LEVC5, facing south



Appendix Figure B.76: LEVC5, facing north (existing tracks)



Appendix Figure B.77: LEVC6, facing east (existing tracks)



Appendix Figure B.78: LEVC6, facing north



Appendix Figure B.79: LEVC7



Appendix Figure B.80: LEVC8



Appendix Figure B.81: LEVC9 (existing tracks, above ground pipeline)



Appendix Figure B.82: LEVC10 (stranded saltmarsh / samphire)



Appendix Figure B.83: LEVC10 (stranded saltmarsh / samphire)



Appendix Figure B.84: LEVC11 (basins with saltmarsh / samphire)



Appendix Figure B.85: LEVC12



Appendix Figure B.86: LEVC13 (chenopod / samphire transition)



Appendix Figure B.87: LEVC14



Appendix Figure B.88: LEVC15



Appendix Figure B.89: LEVC16



Appendix Figure B.90: LEVC17



Appendix Figure B.91: LEVC18



Appendix Figure B.92: LEVC19



Appendix Figure B.93: LEVC20



Appendix Figure B.94: LEVC21_1



Appendix Figure B.95: LEVC21_2



Appendix Figure B.96: LEVC22



Appendix Figure B.97: LEVC23



Appendix Figure B.98: LEVC25 (chenopod shrubland)



Appendix Figure B.99: LEVC25 (samphire shrubland)



Appendix Figure B.100: LEVC26



Appendix Figure B.101: LEVC27 (samphire shrubland avoided)



Appendix Figure B.102: LEVC27 (samphire shrubland avoided)



Appendix Figure B.103: LEVC28



Appendix Figure B.104: LEVC29 (coastal shrubland, avoided)



Appendix Figure B.105: LEVC30



Appendix Figure B.106: LEVC31 (mixed tall shrubland in ephemeral drainage)



Appendix Figure B.107: LEVC31 (ephemeral drainage with mixed shrubs)



Appendix Figure B.108: LEVC32 (mallee on calcareous loam)



Appendix Figure B.109: LEVC33 (chenopod shrubland, Horehound, Onionweed)



Appendix Figure B.110: LEVC34_1 (chenopod low shrubland)



Appendix Figure B.111: LEVC34_2 (chenopod low shrubland)



Appendix Figure B.112: LEVC36 (mixed regrowth)



Appendix Figure B.113: LEVC38 (chenopod low shrubland)



Appendix Figure B.114: LEVC39 (chenopod low shrubland)



Appendix Figure B.115: LEVC40 (north)



Appendix Figure B.116: LEVC40 (south alignment)



Appendix Figure B.117: LEVC41 (chenopod low shrubland)



Appendix Figure B.118: LEVC42_1 False Bay Beach with wrack



Appendix Figure B.119: LEVC42_2 Nitrebush at False Bay Beach



Appendix Figure B.120: LEVC42_3 Nitrebush at False Bay Beach



Appendix Figure B.121: LEVC42_4 False Bay Coastal Shrubland



Appendix Figure B.122: LEVC43 (mallee in Project Footprint, facing north)



Appendix Figure B.123: LEVC44 (mallee in Project Footprint, facing north)



Appendix Figure B.124: LEVC45 (mallee in Project Footprint, facing north)



Appendix Figure B.125: LEVC46 (mallee in Project Footprint, facing north)



Appendix Figure B.126: LEVC47 (mallee in Project Footprint, facing north)



Appendix Figure B.127: LEVC48 (mallee/samphire plains in Project Footprint, facing north)



Appendix Figure B.128: LEVC49 (mallee in Project Footprint, facing north)



Appendix Figure B.129: LEVC50 (mallee in Project Footprint, facing north)



Appendix Figure B.130: LEVC51 (low chenopod shrubland)



Appendix Figure B.131: LEVC52 (low chenopod shrubland, facing north)



Appendix Figure B.132: LEVC52 (low chenopod shrubland, facing south to existing pipeline)

Appendix C. Fauna Data

Appendix C1. Species lists

Appendix Table C1.1: Birds Detected Via Song Meter and / or Bird Survey within PSL Area, Dec 2023

Common name	Species name	EPBC	NPW	Total SM sites	SM01	SM02	SM03	SM04	Bird Survey	Opportunistic
Total detected					8	14	10	17		
Australian Pipit	<i>Anthus australis</i>			1	1					
Australian Raven				2	BS	BS			SM02	SM01
Black-faced Cuckooshrike	<i>Coracina novaehollandiae</i>			1				1		
Black-faced Woodswallow	<i>Artamus cinereus</i>			2	1	1			LEV8/9	Y
Eastern Blue-bonnet	<i>Northiella haematogaster</i>									Y
Chestnut-rumped Thornbill	<i>Acanthiza uropygialis</i>			2			1	1	Y	
Crested Bellbird	<i>Oreoica gutturalis</i>			2		1	1			
Crested Pigeon	<i>Ocyphaps lophotes</i>			3		1	1	1	Y	
Grey Butcherbird	<i>Cracticus torquatus leucopterus</i>			2		1		1		Y
Inland Thornbill	<i>Acanthiza apicalis</i>			1				1	Y	
Little Raven	<i>Corvus benettii</i>			4	1	1	1	1	Y	
Mistletoebird	<i>Dicaeum hirundinaceum</i>			1				1		
Nankeen Kestrel	<i>Falco cenchroides</i>			1	1					Y
Purple-backed Fairywren	<i>Malurus assimilis assimilis</i>			3		1	1	1	Y	
Redthroat	<i>Pyrrholaemus brunneus</i>			1				1	Y	
Rufous Fieldwren	<i>Calamanthus campestris</i>			1				1	LEV8/9	Y
Singing Honeyeater	<i>Gavicalis virescens</i>			3		1	BS	1	Y SM03	
Stubble Quail	<i>Coturnix pectoralis</i>								LEV8/9	Y
Spiny-cheeked Honeyeater	<i>Acanthagenys rufogularis</i>			3		1	1	1		
Splendid Fairywren	<i>Malurus splendens musgravi</i>			2		1		1		
Welcome Swallow	<i>Hirundo neoxena</i>			1		1		BS	Y	
Western Grasswren	<i>Amytornis textillis myall</i>	V	V	3	1	1	1		Y SM03	

Common name	Species name	EPBC	NPW	Total SM sites	SM01	SM02	SM03	SM04	Bird Survey	Opportunistic
White-browed Babbler	<i>Pomatostomus superciliosus</i>			4	1	1	1	1	Y	
White-winged Fairywren	<i>Malurus leucopterus</i>			3	1	1	1	BS	Y	Y
Willie Wagtail	<i>Rhipidura leucophrys</i>			1		1				
Yellow-throated Miner	<i>Manorina flavigula</i>			1				1		

BS = only detected via bird survey, SM = detected at Song Meter sites

Appendix Table C1.2: Opportunistic Mammals Detected within PSL Area December 2023

Common name	Species name	Native	Exotic/Pest	Opportunistic
European Fox	<i>Vulpes vulpes</i>		Yes	live, scats
Feral Cat	<i>Felis catus</i>		Yes	tracks
Red Kangaroo	<i>Osphranter rufus</i>	Yes		
Rabbit	<i>Oryctolagus cuniculus</i>		Yes	live, scats
Sheep	<i>Ovis aries</i>		Yes	scats

Appendix Table C1.3: Birds Detected Via Song Meter and / or Bird Survey within PSL Area, August 2024

Common name	Species name	EPBC	NPW	SM05 / BS05	SM06	BS06	SM07 / BS07	SM08 / BS08	BS Transect	BS09 / VC42	BS10 / VC51	Opportunistic
Total detected												
Australian Pipit	<i>Anthus australis</i>			1		1	1	1	1		1	
Australian Raven	<i>Corvus coronoides</i>			1							1	
Australian Magpie	<i>Gymnorhina tibicen</i>			1		1						
Black-faced Cuckooshrike	<i>Coracina novaehollandiae</i>											1
Black-faced Woodswallow	<i>Artamus cinereus</i>			1		1	1				1	
Brown Falcon	<i>Falco berigora berigora</i>								1			
Common Starling*	<i>Sturnus vulgaris</i>			1			1				1	1
Crested Bellbird	<i>Oreoica gutturalis</i>											1
Crested Pigeon	<i>Ocyphaps lophotes</i>							1	1			
Emu	<i>Dromaius novaehollandiae</i>					1 (5)						
Galah	<i>Eolophus roseicapilla</i>						1					
Grey Butcherbird	<i>Cracticus torquatus leucopterus</i>											1
Grey Fantail	<i>Rhipidura albiscapa</i>						1					
Horsefield's Bronze Cuckoo	<i>Chalcites basalis</i>					1						
Little Raven	<i>Corvus benettii</i>			1		1						
Little Egret	<i>Egretta garzetta nigripes</i>									1		
Mulga Parrot	<i>Psephotellus varius</i>						1					
Nankeen Kestrel	<i>Falco cenchroides</i>					1			1		1 (pair)	
Pied Oyster Catcher	<i>Haematopus longirostris</i>											1
Purple-backed Fairywren	<i>Malurus assimilis assimilis</i>			1			1	1				
Red-backed Kingfisher	<i>Todiramphus pyrrhopygius</i>						1					

Common name	Species name	EPBC	NPW	SM05 / BS05	SM06	BS06	SM07 / BS07	SM08 / BS08	BS Transect	BS09 / VC42	BS10 / VC51	Opportunistic
Red-capped Plover	<i>Charadrius ruficapillus</i>									1 (pair)		
Red Wattlebird	<i>Anthochaera carunculata</i>			1								
Redthroat	<i>Pyrrholaemus brunneus</i>						1 (pair)	1				
Rufous Fieldwren	<i>Calamanthus campestris</i>			1		1	1	1	2			
Pied Oyster Catcher	<i>Haematopus longirostris</i>		R							40+		
Singing Honeyeater	<i>Gavicalis virescens</i>			1			1	1	1	1		1
Spiny-cheeked Honeyeater	<i>Acanthagenys rufogularis</i>			1			1	1	1		1	1
Western Grasswren	<i>Amytornis textilis myall</i>	V	V		1	1	1					
White-eared Honeyeater	<i>Nesoptilotis leucotis</i>					1						
White-browed Babbler	<i>Pomatostomus superciliosus</i>								1			
White-winged Fairywren	<i>Malurus leucopterus</i>			1	1	1	1	1	1		1	1
Willie Wagtail	<i>Rhipidura leucophrys</i>						1					
Yellow-plumed Honeyeater	<i>Ptilotula ornata</i>			1								

*Pest Species; data pooled across multiple surveys per site (e.g. see Section 3.5 for survey effort per site)

Appendix Table C1.4: Opportunistic Mammals Detected within PSL Area August 2024

Common name	Species name	Native	Exotic/Pest	Opportunistic
Feral Cat	<i>Felis catus</i>		Yes	tracks
Rabbit	<i>Oryctolagus cuniculus</i>		Yes	live, scats
Painted Dragon	<i>Ctenophorus pictus</i>		Yes	one individual
Central Bearded Dragon	<i>Pogona vitticeps</i>	Yes		one individual
Mallee Dragon	<i>Ctenophorus fordi</i>	Yes		one individual

Appendix C2. Kaleidoscope cluster analysis for Western Grasswren

Each Song Meter SM4 deployment has audio parameters, GPS, time and temperature stamped at the beginning of each recording session. SM4 audio parameters were as follows: Sample rate 24 000 (stereo), WAV file compression off, 12 dB of preamplifier gain for the internal microphones (left and right microphones), low filter off, high filter off, trigger level off and trigger win off.

Cluster analysis groups calls into numbered clusters of similar sounds which includes bird calls but may also consist of wind, insects and other sounds. The analysis is made more successful by using 'bait' files of known calls of the target species. Bait calls act as a nucleus for clusters of 'like' calls. Seven Western Grasswren sample calls were used as bait calls and replicated six times each, totalling 42 individually labelled files with each containing two to four separate Western Grasswren calls. Kaleidoscope cluster analysis was then performed on the Song Meter files for all sites with the bait files included in the analysis.

Sample Western Grasswren calls used for cluster analysis were sourced from the Xeno-canto (2024) and from within the Song Meter files by listening to and visually searching the files to detect the calls. The Western Grasswren sample call audio parameters were then identified as maximum frequency 11 500Hz, minimum frequency 5 500 Hz, call duration of between 0.8 and 1.2 seconds and maximum inter-syllable gap up to 7 seconds. The analysis is based on a set of determined parameters. The following Kaleidoscope parameters were used:

- Signal detection 5 500 to 11 500 (Hz)
- 0.8 to 1.2 seconds for minimum and maximum length of detection
- 7 second maximum inter-syllable gap
- DC offset not removed (average value of the time domain wave form).

The cluster analysis created 128 clusters and a total of 58042 file extracts of call sequences up to 7 seconds long from the 160 Song Meter recording files. These clusters were assessed by looking for clusters which contained Western Grasswren bait files and viewing and listening to the file extracts within these clusters to determine if they contained Western Grasswren calls.

Many of these file extracts were included in more than one of the clusters and there was a high degree of repetition of the call sequences within the overall cluster analysis results.

Appendix C3. Cluster Analysis Results

For Survey One Western Grasswren calls were returned in at least 25 of the 128 clusters however all of the call sequences were derived from just six of the 160 Song Meter files. The files which contained Western Grasswren calls were:

- Site 1: 9:30 – 9:55 AM on 6 December 2023
- Site 1: 11:00 – 11:30 AM on 6 December 2023
- Site 2: 12:00 – 12:30 PM on 6 December 2023
- Site 2: 8:00 – 8:30 PM on 6 December 2023
- Site 2: 5:30 – 5:55 AM on 7 December 2023
- Site 3: 5:30 – 5:55 AM on 7 December 2023.

The remaining cluster analysis file extracts primarily consisted of wind, industrial noises from the adjacent steel works including the movement of trains and a number of species which have similarities in their calls such as White-winged Wren, Variegated (Purple-backed Fairywren, Splendid Fairywren, Chestnut-rumped Thornbill, Redthroat, White-browed Babbler and Grey Butcherbird.

Appendix C4. LiDAR Results

Appendix Table C4.1: Desktop LiDAR Assessment for Malleefowl Mounds in Project Area

Potential Mound ID	Category	Easting	Northing
1	Not a mound	747838.8	6354264.5
2	Unlikely	748226.1	6354064.5
3	Unlikely	748251.8	6354033.0
4	Likely	748221.6	6354013.0
5	Likely	748190.4	6354050.0
6	Likely	748200.7	6354089.5
7	Unlikely	748834.6	6353385.0
8	Possible	750144.5	6352067.0
9	Possible	750474.9	6351684.0
10	Possible	751382.4	6350746.5
11	Not a mound	754068.9	6350203.2
12	Unlikely	754094.1	6350312.2
13	Not a mound	754916.3	6350622.3



LiDAR 'likely' Malleefowl mound site, verified as 'no Malleefowl mound detected'



LiDAR 'likely' Malleefowl mound site, verified as 'no Malleefowl mound detected'



LiDAR 'likely' Malleefowl mound site, verified as 'no Malleefowl mound detected'

Appendix D. Flora Data

Appendix D1. Survey point data summary

Appendix Table D1.1: Vegetation Survey Point Data Summary

Survey Type	Site Name	Broad Association Lathwida Environmental	Easting	Northing	Broad Community (mapped as) LE
BAM	LEEP1	Samphire +/- chenopod shrublands with infrequent inundation / saline soils	746396	6354850	Samphire shrublands on saline soils
BAM	LEEP2	Low open woodlands of Western Myall / Black Oak over chenopod shrubland	741765	6348392	Western Myall low open woodlands +/- Black Oak/Bullock Bush/False Sandalwood
BAM	LEEP3	Low open Chenopod Shrublands	741280	6349117	Western Myall low open woodlands +/- Black Oak/Bullock Bush/False Sandalwood
BAM	LEEP4	Low open Chenopod Shrublands	742517	6349816	Low open chenopod shrublands
BAM	LEEP5	Mallee with open sclerophyll shrub and chenopod understorey on sand plains / low dunes over calcareous loams	750436	6351360	Mallee with an open sclerophyll shrub and Chenopod understorey on sand plains/ low dunes over calcareous loams
BAM	LEEP6	Low open woodlands of Western Myall +/- Black Oak / Bullock bush over chenopod shrubland	742005	6348740	Western Myall low open woodlands +/- Black Oak/Bullock Bush/False Sandalwood
BAM	LEEP7	Mallee with open sclerophyll shrub and chenopod understorey on sand plains / low dunes over calcareous loams	753538	6349781	Mallee with an open sclerophyll shrub and Chenopod understorey on sand plains/ low dunes over calcareous loams
BAM	LEEP8	Low mallee woodland	751864	6350187	Mallee with an open sclerophyll shrub and Chenopod understorey on sand plains/ low dunes over calcareous loams
BAM	LEEP9	Western Myall regrowth	747509	6354646	Western Myall low open woodlands +/- Black Oak/Bullock Bush/False Sandalwood
BAM	LEEP10	False Sandalwood +/- Mallee over Chenopods	748404	6355648	Mallee with an open sclerophyll shrub and Chenopod understorey on sand plains/ low dunes over calcareous loams
BAM	LEEP11	Tall Coastal Shrublands	749233	6352826	Coastal Shrublands
BAM	LEEP12	Open Mallee +/- False Sandalwood over Chenopod	750076	6351920	Mallee with an open sclerophyll shrub and Chenopod understorey on sand plains/ low dunes over calcareous loams
BAM	LEEP13	Low open Chenopod Shrublands	753935	6350101	Low open chenopod shrublands
BAM	LEEP14	Low open Chenopod Shrublands	756412	6348148	Low open chenopod shrublands
BAM	LEEP15	Low open Chenopod Shrublands	745406	6355039	Low open chenopod shrublands
BAM	LEEP16	Low open Chenopod Shrublands	745265	6354626	Low open chenopod shrublands
SONG METER	LESM01	Low open Chenopod Shrublands	742565	6349797	Low open chenopod shrublands
SONG METER	LESM02	Low open woodlands of Western Myall +/- Black Oak / Bullock bush over chenopod shrubland	742104	6348680	Western Myall low open woodlands +/- Black Oak/Bullock Bush/False Sandalwood
SONG METER	LESM03	Low open woodlands of Western Myall / Black oak over chenopod shrubland	741752	6348397	Western Myall low open woodlands +/- Black Oak/Bullock Bush/False Sandalwood
SONG METER	LESM04	Low open Chenopod Shrublands	741266	6349136	Western Myall low open woodlands +/- Black Oak/Bullock Bush/False Sandalwood

Survey Type	Site Name	Broad Association Lathwida Environmental	Easting	Northing	Broad Community (mapped as) LE
VEG CHECK	LEVC1	Low open woodlands of Western Myall over chenopod understory	740677	6352692	Low open woodlands with Western Myall and BlackOak over Chenopod shrub understorey
VEG CHECK	LEVC2	Low open woodlands of Western Myall +/- Black Oak / Bullock bush over chenopod shrubland	741098	6352895	Western Myall low open woodlands +/- Black Oak/Bullock Bush/False Sandalwood
VEG CHECK	LEVC3	Low open woodlands of Western Myall / Black Oak +/- False Sandalwood over chenopod shrubland	742282	6353449	Western Myall low open woodlands +/- Black Oak/Bullock Bush/False Sandalwood
VEG CHECK	LEVC4	Chenopod open shrubland +/- emergent tree	743710	6354128	Low open chenopod shrublands
VEG CHECK	LEVC5	Low open chenopod shrublands	744343	6354433	Low open chenopod shrublands
VEG CHECK	LEVC6	Low open chenopod shrublands	745124	6354843	Low open chenopod shrublands
VEG CHECK	LEVC7	Chenopod / samphire low open shrubland on plains	745294	6354952	Chenopod / Samphire low open shrubland on plains
VEG CHECK	LEVC28	Low open Chenopod Shrublands	743450	6350627	Low open chenopod shrublands
VEG CHECK	LEVC29	Coastal Shrubland	753546	6348387	Mallee with an open sclerophyll shrub and Chenopod understorey on sand plains/ low dunes over calcareous loams
VEG CHECK	LEVC36	Tall Mixed Shrubland (regeneration)	749533	6352341	Mallee with an open sclerophyll shrub and Chenopod understorey on sand plains/ low dunes over calcareous loams
VEG CHECK	LEVC8	Chenopod / samphire low open shrubland on plains	746238	6354733	Chenopod / Samphire low open shrubland on plains
VEG CHECK	LEVC9	Chenopod / samphire low open shrubland on plains	745675	6354340	Chenopod / Samphire low open shrubland on plains
VEG CHECK	LEVC10	Chenopod / samphire low open shrubland on plains	745283	6353996	Chenopod / Samphire low open shrubland on plains
VEG CHECK	LEVC11	Samphire plains (no Chenopod)	745558	6354227	Samphire shrublands on saline soils
VEG CHECK	LEVC12	Samphire plains (no Chenopod)	745095	6353577	Samphire shrublands on saline soils
VEG CHECK	LEVC13	mapping split between communities	744791	6352878	Samphire shrublands on saline soils
VEG CHECK	LEVC14	Low open Chenopod Shrublands	741525	6348424	Low open chenopod shrublands
VEG CHECK	LEVC15	Low open Chenopod Shrublands	741399	6348589	Western Myall low open woodlands +/- Black Oak/Bullock Bush/False Sandalwood
VEG CHECK	LEVC16	Low open woodlands of Western Myall + Bullock bush over chenopod shrubland	741153	6350006	Western Myall low open woodlands +/- Black Oak/Bullock Bush/False Sandalwood
VEG CHECK	LEVC17	Low open woodlands of Western Myall +/- Black Oak / Bullock bush / False Sandalwood over chenopod shrubland	741096	6350340	Western Myall low open woodlands +/- Black Oak/Bullock Bush/False Sandalwood
VEG CHECK	LEVC18	Low open woodlands of Western Myall +/- Black Oak / Bullock bush / False Sandalwood over chenopod shrubland	740909	6351444	Low open woodlands with Western Myall and BlackOak over Chenopod shrub understorey
VEG CHECK	LEVC19	Low open woodlands of Western Myall +/- Black Oak / Bullock bush / False Sandalwood over chenopod shrubland	741260	6351819	Western Myall low open woodlands +/- Black Oak/Bullock Bush/False Sandalwood
VEG CHECK	LEVC20	Low open woodlands of Western Myall / Black Oak over chenopod shrubland	742164	6352022	Western Myall low open woodlands +/- Black Oak/Bullock Bush/False Sandalwood
VEG CHECK	LEVC21	Low open woodlands of Western Myall / Black Oak over chenopod shrubland	743274	6352274	Western Myall low open woodlands +/- Black Oak/Bullock Bush/False Sandalwood
VEG CHECK	LEVC22	Low open Chenopod Shrublands	744047	6352455	Low open chenopod shrublands

Survey Type	Site Name	Broad Association Lathwida Environmental	Easting	Northing	Broad Community (mapped as) LE
VEG CHECK	LEVC23	Chenopod / samphire low open shrubland on plains	744505	6352558	Chenopod / Samphire low open shrubland on plains
VEG CHECK	LEVC25	mapping split between communities	744626	6352495	Samphire shrublands on saline soils
VEG CHECK	LEVC26	Samphire shrublands with infrequent inundation / saline soils	744217	6351546	Samphire shrublands on saline soils
VEG CHECK	LEVC27	Samphire shrublands with infrequent inundation / saline soils	743840	6351073	Samphire shrublands on saline soils
VEG CHECK	LEVC30	Mallee with open sclerophyll shrub and chenopod understorey on sand plains / low dunes over calcareous loams	752123	6349996	Mallee with an open sclerophyll shrub and Chenopod understorey on sand plains/ low dunes over calcareous loams
VEG CHECK	LEVC31	Mixed shrublands in ephemeral drainage lines	753259	6349754	Mixed shrublands in ephemeral drainage lines
VEG CHECK	LEVC32	Mallee with open sclerophyll shrub and chenopod understorey on sand plains / low dunes over calcareous loams	753432	6349781	Mallee with an open sclerophyll shrub and Chenopod understorey on sand plains/ low dunes over calcareous loams
VEG CHECK	LEVC33	Low open Chenopod shrublands (Bladder Saltbush / Pearl Saltbush)	754507	6349501	Low open chenopod shrublands
VEG CHECK	LEVC34	Low open Chenopod Shrublands	756282	6348210	Low open chenopod shrublands
VEG CHECK	LEVC35	Mallee with open sclerophyll shrub and chenopod understorey on sand plains / low dunes over calcareous loams	751230	6350560	Mallee with an open sclerophyll shrub and Chenopod understorey on sand plains/ low dunes over calcareous loams
WEED	LEOP1	Horehound (<i>Marrubium vulgare</i>)	743346	6352291	Western Myall low open woodlands +/- Black Oak/Bullock Bush/False Sandalwood
WEED	LEOP2	Horehound (<i>Marrubium vulgare</i>), Ice Plant (<i>Mesembryanthemum sp.</i>)	744654	6352588	Samphire shrublands on saline soils
WEED	LEOP4	Prickly Pear (<i>Opuntia sp.</i>)	742553	6349419	Low open chenopod shrublands
VEG CHECK	LEVC35	Mallee / chenopod / False Sandalwood	753377	6349966	Mallee with open sclerophyll shrub and chenopod understorey on sand plains / low dunes over calcareous loams
VEG CHECK	LEVC36	Mallee / chenopod / False Sandalwood	753311	6349877	Mallee with open sclerophyll shrub and chenopod understorey on sand plains / low dunes over calcareous loams
VEG CHECK	LEVC37	Bladder Saltbush, Pearl Blue Bush +/- False Sandalwood	753701	6350021	Low open Chenopod Shrublands
VEG CHECK	LEVC38	Bladder Saltbush, Pearl Blue Bush less False Sandalwood	754213	6350181	Low open Chenopod Shrublands
VEG CHECK	LEVC39	Bladder Saltbush, Pearl Blue Bush no False Sandalwood	754641	6350315	Low open Chenopod Shrublands
VEG CHECK	LEVC40	Bladder Saltbush, Pearl Blue Bush +/- False Sandalwood	755157	6350474	Low open Chenopod Shrublands
VEG CHECK	LEVC41	Bladder Saltbush, Pearl Blue Bush +/- Black Bluebush	756127	6350775	Low open Chenopod Shrublands
VEG CHECK	LEVC42	Coastal Shrubland / Nitrebush (shorebird beach with seagrass wrack, stones)	751970	6349658	Coastal Airstrip
VEG CHECK	LEVC43	Mallee – same both sides of fence	752810	6349982	Mallee with an open sclerophyll shrub and Chenopod understorey on sand plains/ low dunes over calcareous loams
VEG CHECK	LEVC44	Mallee – same both sides of fence	752057	6350160	Mallee with an open sclerophyll shrub and Chenopod understorey on sand plains/ low dunes over calcareous loams
VEG CHECK	LEVC45	Mallee – same both sides of fence	750963	6351054	Mallee with an open sclerophyll shrub and Chenopod understorey on sand plains/ low dunes over calcareous loams
VEG CHECK	LEVC46	Mallee – same both sides of fence	750358	6351687	Mallee with an open sclerophyll shrub and Chenopod understorey on sand plains/ low dunes over calcareous loams

Survey Type	Site Name	Broad Association Lathwida Environmental	Easting	Northing	Broad Community (mapped as) LE
VEG CHECK	LEVC47	Mallee – same both sides of fence	749378	6352718	Mallee with an open sclerophyll shrub and Chenopod understorey on sand plains/ low dunes over calcareous loams
VEG CHECK	LEVC48	Bladder Saltbush +/- Samphire	749104	6353004	Chenopod / Samphire low open shrubland on plains
VEG CHECK	LEVC49	Mallee / False Sandalwood	748574	6353563	Mallee with an open sclerophyll shrub and Chenopod understorey on sand plains/ low dunes over calcareous loams
VEG CHECK	LEVC50	Mallee / Western Myall over Chenopod, more Mallee than regrowth	747811	6354376	Mallee with an open sclerophyll shrub and Chenopod understorey on sand plains/ low dunes over calcareous loams
VEG CHECK	LEVC51	Low Open Chenopod Shrublands	745298	6354648	Low Open Chenopod Shrublands
VEG CHECK	LEVC52	Bladder Saltbush / Black Bluebush Low Shrubland	744158	6353236	Low Open Chenopod Shrublands

Appendix D2. Species lists

Appendix Table D2.1: Flora species per BAM site

Species name	Common Name	EPBC	NPW	Exotic	LEEP1	LEEP2	LEEP3	LEEP4	LEEP5	LEEP6	LEEP7	LEEP8	LEEP9	LEEP10	LEEP11	LEEP12	LEEP13	LEEP14	LEEP15	LEEP16
<i>Abutilon otocarpum</i>	Desert Lantern-bush											1								
<i>Acacia ligulata</i>	Umbrella Bush									1						1	1			
<i>Acacia oswaldii</i>	Umbrella Wattle							1				1					1			
<i>Acacia papyrocarpa</i>	Western Myall						1	1			1			1	1					
<i>Acacia wilhelmiana</i>	Dwarf Nealie											1	1				1			
<i>Alectryon oleifolius</i> <i>ssp. canescens</i>	Bullock Bush										1	1		1	1	1	1			
<i>Alyxia buxifolia</i>	Sea Box															1				
<i>Amyema quandang</i> <i>var. quandang</i>	Grey Mistletoe						1													
<i>Aristida contorta</i>	Curly Wire-grass																1			
<i>Asphodelus fistulosus</i>	Onion Weed				*							1			1	1		1	1	1
<i>Atriplex vesicaria</i>	Bladder Saltbush					1	1	1	1		1	1	1	1	1		1	1	1	1
<i>Austrostipa</i> <i>elegantissima</i>	Feather Spear-grass									1			1		1	1				
<i>Austrostipa nitida</i>	Balcarra Spear-grass							1	1		1				1					
<i>Austrostipa nodosa</i>	Tall Spear-grass												1							
<i>Austrostipa sp.</i>	Spear-grass																1	1	1	1
<i>Austrostipa stipoides</i>	Coast Spear-grass											1								
<i>Beyeria lechenaultii</i>	Pale Turpentine Bush											1				1				
<i>Beyeria sp.</i>	Turpentine Bush									1										
<i>Brachyscome sp.</i>	Native Daisy					1														
<i>Calotis hispidula</i>	Hairy Burr-daisy																	1		
<i>Carpobrotus</i> <i>modestus</i>	Inland Pigface															1	1			
<i>Carpobrotus sp.</i>	Pigface									1										
<i>Carrichtera annua</i>	Ward's Weed				*				1			1		1	1	1	1	1	1	1
<i>Casuarina pauper</i>	Black Oak							1			1									
<i>Chenopodium</i> <i>curvispicatum</i>	Cottony Goosefoot																			
<i>Chenopodium</i> <i>desertorum ssp.</i>	Desert Goosefoot						1	1	1						1	1				
<i>Convolvulaceae sp.</i>	Bindweed Family								1											
<i>Cratystylis</i> <i>conocephala</i>	Bluebush Daisy																1			
<i>Dianella revoluta var.</i>	Flax-lilly															1				
<i>Disphyma</i> <i>crassifolium ssp.</i> <i>clavellatum</i>	Round-leaf Pigface					1			1											1
<i>Dissocarpus biflorus</i> <i>var.</i>	Two-horn Saltbush								1											

Species name	Common Name	EPBC	NPW	Exotic	LEEP1	LEEP2	LEEP3	LEEP4	LEEP5	LEEP6	LEEP7	LEEP8	LEEP9	LEEP10	LEEP11	LEEP12	LEEP13	LEEP14	LEEP15	LEEP16
<i>Dissocarpus paradoxus</i>	Ball Bindyi											1								
<i>Dodonaea stenozyga</i>	Desert Hop-bush											1	1							
<i>Dodonaea viscosa ssp. angustissima</i>	Narrow-leaf Hop-bush											1	1			1				
<i>Enchylaena tomentosa var.</i>	Ruby Saltbush						1	1	1	1	1	1	1	1	1	1	1	1		
<i>Eragrostis dielsii</i>	Mulka					1														
<i>Eremophila alternifolia</i>	Narrow-leaf Emubush											1								
<i>Eremophila glabra ssp.</i>	Tar Bush												1			1	1	1		
<i>Eremophila scoparia</i>	Broom Emubush										1	1	1		1			1		
<i>Eucalyptus calcareana</i>	Nundroo Mallee											1								
<i>Eucalyptus gracilis</i>	Yorrell									1			1		1		1			
<i>Eucalyptus leptophylla</i>	Narrow-leaf Red Mallee												1							
<i>Eucalyptus oleosa ssp.</i>												1	1		1		1			
<i>Eucalyptus socialis ssp.</i>	Beaked Red Mallee									1		1	1							
<i>Euphorbia tannensis ssp. eremophila</i>	Desert Spurge																		1	
<i>Exocarpos aphyllus</i>	Leafless Cherry											1		1	1		1			1
<i>Frankenia serpyllifolia</i>	Thyme Sea-heath					1														1
<i>Geijera linearifolia</i>	Sheep Bush							1		1							1			
<i>Grevillea huegelii</i>	Comb Grevillea											1								
<i>Grevillea ilicifolia ssp.</i>	Holly-leaf Grevillea									1										
<i>Hakea leucoptera ssp. leucoptera</i>	Silver Needlewood						1					1								
<i>Hemichroa diandra</i>	Mallee Hemichroa					1														
<i>Hyalosperma sp.</i>	Sunray													1						
<i>Lawrencia squamata</i>	Thorny Lawrencia																		1	
<i>Lepidium africanum</i>	Common Peppergrass				*															1
<i>Lepidium sp.</i>	Peppergrass					1														
<i>Logania linifolia</i>	Flax-leaf Logania											1	1							
<i>Lycium australe</i>	Australian Boxthorn																		1	
<i>Lycium ferocissimum</i>	African Boxthorn				*								1							1
<i>Maireana appressa</i>	Pale-fruit Bluebush					1														
<i>Maireana brevifolia</i>	Short-leaf Bluebush											1	1							
<i>Maireana brevifolia</i>	Short-leaf Bluebush											1	1							

Species name	Common Name	EPBC	NPW	Exotic	LEEP1	LEEP2	LEEP3	LEEP4	LEEP5	LEEP6	LEEP7	LEEP8	LEEP9	LEEP10	LEEP11	LEEP12	LEEP13	LEEP14	LEEP15	LEEP16
<i>Maireana erioclada</i>	Rosy Bluebush														1	1				
<i>Maireana pentatropis</i>	Erect Mallee Bluebush												1				1			
<i>Maireana pyramidata</i>	Black Bluebush						1	1	1		1							1	1	1
<i>Maireana sedifolia</i>	Bluebush						1	1				1	1	1	1			1	1	1
<i>Maireana sp.</i>	Bluebush/Fissure-plant																			
<i>Maireana trichoptera</i>	Hairy-fruit Bluebush								1					1						
<i>Maireana turbinata</i>	Top-fruit Bluebush							1	1		1							1		1
<i>Medicago sp.</i>	Medic				*													1	1	1
<i>Melaleuca lanceolata</i>	Dryland Tea-tree												1							
<i>Mesembryanthemum crystallinum</i>	Common Iceplant				*					1						1	1			
<i>Minuria cunninghamii</i>	Bush Minuria					1													1	1
<i>Muehlenbeckia adpressa</i>	Climbing Lignum												1			1	1			
<i>Muehlenbeckia gunnii</i>	Coastal Climbing Lignum									1										
<i>Myoporum platycarpum ssp.</i>	False Sandalwood									1		1	1	1	1		1	1		
<i>Nitraria billardieri</i>	Nitre-bush											1	1	1			1			
<i>Olearia muelleri</i>	Mueller's Daisy-bush									1										
<i>Olearia pimeleoides</i>	Pimelea Daisy-bush											1				1				
<i>Osteocarpum sp.</i>	Bonefruit																			1
<i>Oxalis sp.</i>	Sorrel																		1	
<i>Pimelea microcephala ssp.</i>	Shrubby Riceflower									1		1				1				
<i>Pittosporum angustifolium</i>	Native Apricot												1					1		
<i>Podolepis sp.</i>	Copper-wire Daisy																			
<i>Ptilotus obovatus</i>	Silver Mulla Mulla											1					1	1		
<i>Reichardia tingitana</i>	False Sowthistle				*															1
<i>Rhagodia parabolica</i>	Mealy Saltbush						1	1		1	1	1	1	1		1	1			
<i>Rhagodia spinescens</i>	Spiny Saltbush										1	1						1	1	
<i>Rhagodia ulicina</i>	Intricate Saltbush						1					1		1	1	1	1			
<i>Roepora apiculata</i>	Pointed Twinleaf									1										
<i>Roepora eremaea</i>	Twinleaf															1				
<i>Roepora glauca</i>	Pale Twinleaf											1	1		1	1	1			
<i>Rytidosperma auriculatum</i>	Lobed Wallaby-grass																			
<i>Rytidosperma caespitosum</i>	Common Wallaby-grass																	1	1	

Species name	Common Name	EPBC	NPW	Exotic	LEEP1	LEEP2	LEEP3	LEEP4	LEEP5	LEEP6	LEEP7	LEEP8	LEEP9	LEEP10	LEEP11	LEEP12	LEEP13	LEEP14	LEEP15	LEEP16
<i>Salsola australis</i>	Buckbush											1			1					
<i>Scaevola spinescens</i>	Spiny Fanflower										1	1	1			1		1	1	
<i>Sclerolaena diacantha</i>	Grey Bindyi											1						1	1	1
<i>Sclerolaena divaricata</i>	Tangled Bindyi														1	1				
<i>Sclerolaena obliquicuspis</i>	Oblique-spined Bindyi							1	1		1	1	1		1		1	1	1	
<i>Senecio sp.</i>	Groundsel																			1
<i>Senna artemisioides ssp. alicia x ssp. coriacea</i>	Desert Senna														1					
<i>Senna artemisioides ssp. artemisioides x ssp. coriacea</i>	Desert Senna									1				1				1		
<i>Senna artemisioides ssp. artemisioides x ssp. filifolia</i>	Desert Senna																1			
<i>Senna artemisioides ssp. filifolia</i>	Fine-leaf Desert Senna															1				
<i>Senna artemisioides ssp. petiolaris</i>	Senna						1							1	1	1	1			
<i>Senna artemisioides ssp. X coriacea</i>	Broad-leaf Desert Senna																1			
<i>Senna cardiosperma ssp. gawlerensis</i>	Gawler Ranges Senna											1		1	1	1				
<i>Setaria constricta</i>	Knotty-butt Paspalidium											1				1	1			
<i>Sida fibulifera</i>	Pin Sida							1											1	
<i>Sida intricata</i>	Twiggy Sida																	1	1	
<i>Sida platycalyx</i>	Lifesaver Burr											1								
<i>Sida sp.</i>	Sida					1														
<i>Sisymbrium erysimoides</i>	Smooth Mustard				*													1	1	
<i>Solanum coactiliferum</i>	Tomato-bush																	1	1	
<i>Solanum lasiophyllum</i>	Flannel Bush								1		1									
<i>Solanum petrophilum</i>	Rock Nightshade						1					1				1	1			
<i>Tecticornia halocnemoides ssp.</i>	Grey Samphire					1														
<i>Tecticornia indica ssp.</i>	Brown-head Samphire					1														1
<i>Tecticornia tenuis</i>	Slender Samphire					1														1
<i>Tetragonia tetragonoides</i>	New Zealand Spinach												1			1	1			

Species name	Common Name	EPBC	NPW	Exotic	LEEP1	LEEP2	LEEP3	LEEP4	LEEP5	LEEP6	LEEP7	LEEP8	LEEP9	LEEP10	LEEP11	LEEP12	LEEP13	LEEP14	LEEP15	LEEP16
<i>Thysanotus baueri</i>	Mallee Fringe-lily																			
<i>Vittadinia cuneata</i> var.	Fuzzy New Holland Daisy																			1
<i>Vittadinia</i> sp.	New Holland Daisy															1				
<i>Westringia rigida</i>	Stiff Westringia									1		1	1							
<i>Zygophyllum aurantiacum/eremaicum</i>	Shrubby Twinleaf																	1		
	total species					13	12	14	13	18	14	42	29	16	24	31	32	25	21	21



Attachment C Significant Impact Assessment

EPBC Act Significant Impact Assessment for the Whyalla Hydrogen Pipeline Project

Epic Energy



LATHWIDA
ENVIRONMENTAL



28 November 2024

Final

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The sole purpose of this report and the associated services performed by Lathwida is to document results of the Significant Impact Assessment undertaken in accordance with requirements set out in the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act) and supporting guidance documents. This document and associated data will support the development of primary approval documentation required for the Hydrogen Jobs Plan Pipeline Project in South Australia. The report is based on a review of available data and technical ecological reports outlining survey findings within the survey area and buffers for Epic Energy. The scope of services, as described in this report, was developed with Epic Energy.

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Lathwida collected and reviewed data and information available in the public domain at the time or times outlined in this report. The passage of time, manifestation of latent conditions or impacts of future events may require further examination of the project and subsequent data analysis, and re-evaluation of the data, findings, observations and conclusions expressed in this report. Lathwida has prepared this report in accordance with the usual care and thoroughness of the consulting profession, for the sole purpose described above and by reference to applicable standards, guidelines, procedures and practices at the date of issue of this report. For the reasons outlined above, however, no other warranty or guarantee, whether expressed or implied, is made as to the data, observations and findings expressed in this report, to the extent permitted by law.

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1 Introduction

This document presents a significant impact assessment of the potential residual impacts of the construction and operation activities of the Whyalla Hydrogen Pipeline Project (the Project/the Proposed Action) which is associated with the 'the Hydrogen Jobs Plan' (HJP) being pursued by the Government of South Australia.

Epic Energy South Australia Pty Ltd (Epic Energy) is the proponent of the Project. Epic Energy is the operator of the existing Whyalla Gas Lateral which is depicted in blue in Figure 1.1.

This significant impact assessment considers potential impacts upon identified Matters of National Environmental Significance (MNES) as protected under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act) to support the Epic Energy referral under the EPBC Act for construction and operation activities.

The Proposed Action would require temporary clearance of up to 102 ha of vegetation comprising known and potential habitat for threatened fauna species listed under the EPBC Act within a Project Area of 1,748 hectares (ha). Noting that of this 102 ha, only 0.16 ha permanent clearance, the remainder will be rehabilitated. Epic Energy has reviewed the proposal against the EPBC Significant Impact Guidelines 1.1 (DotE 2013) and as discussed in the EPBC referral, the Project is unlikely to have a significant impact on any of the MNES.

1.1 Relevant areas

Epic Energy has been granted a preliminary survey licence (PSL) by the Government of South Australia's Department for Energy and Mining under the *Energy Resources Act 2000* (SA), which entitles Epic Energy to access land within the PSL Area for the purposes of carrying out survey work, geotechnical investigations and associated planning activities for the proposed construction and operation of the Project. The PSL Area is a broad area to allow for refinement and re-alignment of proposed pipeline corridors where required. The area subject to the PSL is set out in Figure 1.1, referred to as the PSL Area.

Notwithstanding that Epic Energy has been granted a PSL over the PSL Area, the proposed pipeline corridor, the subject of the EPBC referral, is a smaller area within the PSL Area and is depicted in Figure 1.2, referred to as the Project Area.

The final pipeline alignment, while subject to final design and some ongoing liaison with key stakeholders, is at a reasonably high level of refinement and is unlikely to change significantly. This assessment has considered the potential impacts to MNES in the broader PSL Area with a particular focus on the Project Area.

1.2 Assessment

The assessment presented here considers a total of 52 MNES within the PSL Area, including one Threatened Ecological Community (TEC), 29 threatened species and 22 migratory species (nine of which are also threatened). More detail is provided for three key MNES that are known to occur in the Project Area based on a combination of desktop and on-ground ecological survey efforts. These include a Protected Matters Search Tool (PMST) report generated in January 2024 (Appendix A).

The three key MNES species considered to be relevant to the Project are the Western Grasswren (*Amytornis textilis myall*), Southern Whiteface (*Aphelocephala leucopsis*) and Malleefowl (*Leipoa ocellata*), all of which are currently listed as Vulnerable under the EPBC Act.

Migratory and threatened shorebird species highlighted by the PMST report are also considered, given they are known to occur in habitats adjacent the PSL Area, however habitats relevant to these species are not present within the Project Area.

This assessment uses habitat descriptions and on-ground survey data arising from ecological surveys undertaken spring and early summer 2022, late summer/early autumn 2023 (Jacobs 2023a, 2023b, Infrastructure SA 2024), spring 2023 (EBS 2023) and early summer (December 2023) /early autumn (March 2024) and winter (August 2024) (Lathwida 2024a, 2024b). These studies have been undertaken to support corridors for the broader HJP, Infrastructure SA's Northern Water Project (NWP) and more recently the PSL Area and the Project Area (i.e. more recent summer, autumn and winter surveys, Lathwida 2024a, 2024b). Records from some other studies undertaken in the PSL Area (e.g. for proposed solar farms) have also been considered (e.g. where records are part of publicly available data, DEW 2024).

This document provides a significant impact assessment of the Project under the EPBC Act, against the Department of the Environment (DotE) EPBC Matters of National Environmental Significance – Significant Impact Guidelines 1.1 (DotE 2013). It addresses the Significant Impact Criteria outlined in DotE Guideline (2013), summarises the likelihood of occurrence for the 42 terrestrial species and one TEC highlighted as potentially occurring, and provides an overall assessment of residual impacts to the MNES species considered to be potentially present within, or immediately adjacent, the PSL Area. Further detail regarding discrete disturbance areas for three species that are known to occur in the Project Area is also provided.

1.3 Regulatory context

Legislation relevant to this EPBC Act significant impact assessment and the determination of ecological values associated with the Project is summarised below.

It should be noted that whilst the MNES species identified within the PMST report (Appendix A) may also have a State listing under the *National Parks and Wildlife Act 1972* (SA) (NPW Act), the relevance to State criteria is not considered in this report, as this report focuses specifically on matters associated with the EPBC Act. State criteria have been assessed within the suite of associated reports referenced herein (Jacobs 2023b, Infrastructure SA 2024, EBS 2023, Lathwida 2024b).

1.3.1 Environment Protection and Biodiversity Conservation Act 1999

The EPBC Act is the Australian Government's primary environmental legislation. It provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities and heritage places — defined in the EPBC Act as MNES. Under the EPBC Act, Actions (as that term is defined in the EPBC Act) that are likely to have a significant impact on an MNES cannot be undertaken without referral to the Department of Climate Change, Energy, the Environment and Water (DCCEEW) for consideration and approval under the EPBC Act.

The nine MNES identified in the EPBC Act are:

- world heritage properties
- national heritage places
- wetlands of international importance (listed under the Ramsar Convention)
- listed threatened species and ecological communities
- listed migratory species (protected under international agreements)
- Commonwealth marine areas
- Great Barrier Reef Marine Park
- nuclear actions (including uranium mines)
- water resources (that related to coal seam gas development and large coal mining development).

1.4 Project definitions

For the purpose of this significant impact assessment of the Project, the following terminology has been adopted:

- Whyalla Hydrogen Pipeline Project (the Project)
- Whyalla Hydrogen Facility: the facility to be constructed and operated by, or on behalf of, the Office of Hydrogen Power South Australia (OHPSA) in North Whyalla to produce hydrogen to be stored and transported by the Project
- PSL Area: being the area (7,233 ha) subject to the PSL granted in favour of Epic Energy under the PGE Act (Figure 1.1)
- Project Area: being the area (1,509 ha) within the PSL Area which includes the proposed pipeline corridor and a buffer along the corridor, which is the subject of the EPBC Act referral under the EPBC Act (Figure 1.2).

- Disturbance Footprint: being the area of anticipated disturbance required within the Project Area for the proposed pipeline alignment and ancillary infrastructure (e.g. valve stations, tracks, laydown) associated with the construction and operation activities, as well as buffer areas to enable safe execution of construction activities. The Disturbance Footprint currently includes a buried loop pipeline of approximately 22.5 km in length (Figure 1.3 and Figure 1.4)
- Study Area (5 km buffer on the PSL Area) (Figure 1.1).

1.5 The Whyalla Hydrogen Pipeline Project (the Project)

The Government of South Australia has committed \$593 million to the HJP to build a world-leading hydrogen power station, electrolyser and storage facility near Whyalla for operation in early 2026. The OHPSA has been established to oversee the design and delivery of the HJP. Epic Energy has been appointed to progress the design and engineering of a dual-purpose integrated hydrogen storage and transmission pipeline associated with the broader HJP project. Here 'the Project' refers to the Epic Energy pipeline component of the larger HJP project.

Epic Energy proposes to construct and operate the Whyalla Hydrogen Pipeline (WHP) – an underground storage and transmission pipeline and associated infrastructure, including compression facilities for storage and transportation of hydrogen produced at the Whyalla Hydrogen Facility.

The Project involves the following key construction components, in order from west (Whyalla) to south (Port Bonython):

- a compressor station and inlet facility at the Whyalla Hydrogen Facility to compress the hydrogen for injection into the WHP
- a buried and looped dual pipeline designed to store and transport hydrogen (nominally 900 mm) approximately 22.5 km long
- a valve station at a location near Fitzgerald Bay Road Port Bonython (where the pipeline will loop and return to the Whyalla Hydrogen Facility).

The proposed pipeline corridor runs from north of Whyalla to approximately 4 kilometres (km) from Port Bonython (Figure 1.3). The proposed pipeline will be situated predominantly within the City of Whyalla local government area, with a short section in the unincorporated areas Whyalla (i.e. land not within a council area) and is within the region overseen by the Eyre Peninsula (EP) Landscape Board. The Barnjarla people have been recognised as the Traditional Owners of the region.

Access to the site during construction activities is anticipated to be via the existing Lincoln Highway and Port Bonython Road which are managed and maintained by the Government of South Australia's Department for Infrastructure and Transport (DIT) and the City of Whyalla. This will be subject to further assessment with the Project's traffic specialist.

Design development has aimed to avoid and minimise impacts on native vegetation where practicable and an alignment has been selected which follows, to the extent possible, existing corridors (including road, rail, water pipeline and gas/petroleum pipelines) and using areas of existing disturbance where possible. For example, the alignment north of False Bay avoids intertidal samphire areas and areas of cultural heritage significance that were identified in the route selection process. Further refinement of the construction footprint, through detailed design, will be considered to reduce impacts. This may include a walk through with an ecologist, arborist and construction design specialist to further reduce the construction right of way where possible.

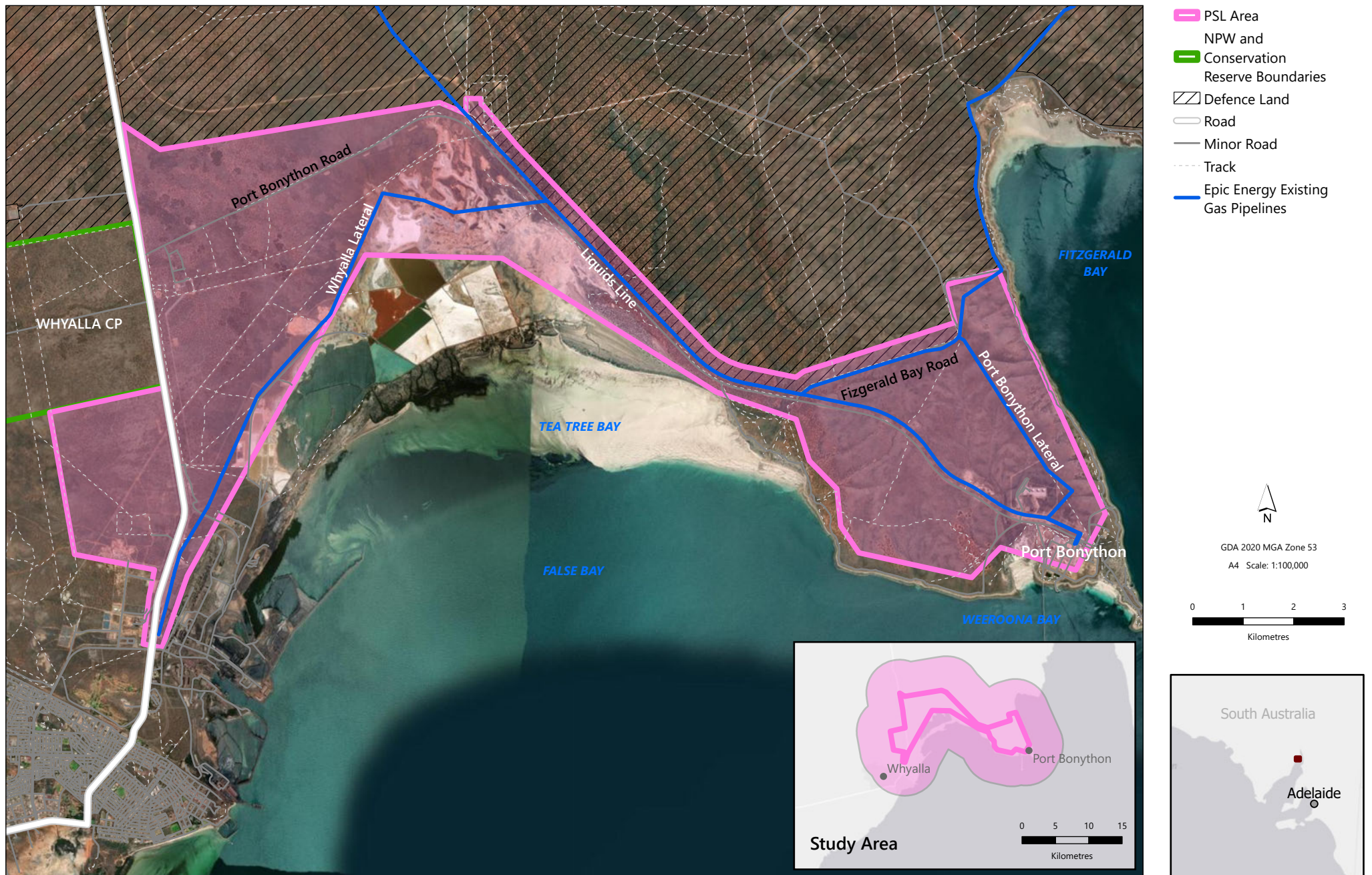


Figure 1.1: Preliminary Survey Licence (PSL) Area



Figure 1.2: Project Area



Figure 1.3: Proposed pipeline

1.6 Ecological surveys

In addition to the baseline assessment work undertaken for WHP Project, a number of field studies and surveys have been completed for prefeasibility studies and ongoing approvals works to support the larger HJP project. These support the current understanding of vegetation, habitat and existing ecological values of the PSL Area, Study Area and surrounds. A summary of previous and baseline studies undertaken is provided in Table 1.1.

Table 1.1: Summary of existing studies and field surveys used in this impact assessment

Report	Target Area	Assessment
Jacobs (2023a)	Port Bonython via Port Bonython Road and Lincoln highway	Desktop and preliminary field assessments of the proposed Hydrogen Hub at Port Bonython and areas of land south of Whyalla Conservation Park/west of Lincoln Highway. The studies included preliminary likelihood assessments, draft vegetation mapping, bird surveys, song meter deployment and Bushland Assessments (vegetation assessments). Six broad vegetation communities were mapped. No EPBC listed species were detected (at Port Bonython). The potential saltmarsh TEC is discussed given stranded saltmarsh occurs adjacent Port Bonython Road. Species considered likely or known to occur in the Project Area include Malleefowl (records along Port Bonython Road in mallee habitat) and Western Grasswren (potential to occur in taller chenopod shrubland / myall woodlands) nearer Lincoln Highway. A number of coastal/shorebirds are considered to have potential to occur in adjacent areas (e.g. saltmarsh and Whyalla Saltfields).
Jacobs (2023b)	Hydrogen Jobs Plan Site 1	Desktop and field assessments of the proposed HJP 'site 1'. The studies included the results of desktop assessments and several field assessments including song meter deployment, bird survey, Bushland Assessment Methodology (BAM) assessments and updates to habitat mapping. The report discusses ecological constraints including known areas of high-quality habitat for the Western Grasswren, and suggests proposed infrastructure should be placed in areas of Pearl Bluebush (<i>Maireana sedifolia</i>) lower shrubland and east of the water tanks in areas of existing disturbance and infrastructure. The study suggests avoiding impacts to treed areas that will take longer to rehabilitate and will provide habitat for Western Grasswren as well as Southern Whiteface.
Infrastructure SA (2023)	NWP	Desktop and several field assessments for NWP, including vegetation assessments and mapping and targeted Western Grasswren surveys, song meter deployment and opportunistic detection of Southern Whiteface (prior to listing). Surveys occurred concurrently or separately from HJP surveys and included areas adjacent the PSL (e.g. along Port Bonython Road / Port Bonython Road, north of PSL Area in Department of Defence land, along Lincoln highway).
EBS (2023)	HJP Site 1/area east of Lincoln Highway north and south of Port Bonython Road	A targeted Western Grasswren survey in October 2023. Call playback methods were used at 24 sites. Nine of the sites were located adjacent Lincoln Highway north and south of Port Bonython Road and align within the PSL Area. Western Grasswren were detected at three of these sites; two were north of Port Bonython Road, one was south of Port Bonython Road, immediately adjacent the Lincoln Highway and near the southern extent of the PSL (e.g. south of proposed solar farm). Another eight sites were within the PSL Area that is part of 'HJP Site 1' and is west of the Lincoln Highway. Western Grasswren were detected at four of these sites. EBS (2023) suggested the majority of habitat within their study area was suitable for Western Grasswren, including areas mapped as: Chenopod open shrublands +/- emergent trees, low open woodlands of Western Myall with a Chenopod shrub understorey and low open woodlands with Western Myall and Black Oak over Chenopod shrub understorey. One degraded area of Western Myall over Chenopod was not considered suitable given the presence of multiple existing tracks, highly disturbed soil and a borrow pit.

Report	Target Area	Assessment
Baseline Ecology Report Lathwida (2024b)	PSL Area (Port Bonython Road/Lincoln Highway)	<p>Desktop and field survey within the PSL Area to supplement Jacobs (2023a and 2023b) surveys. The study involved vegetation mapping, BAM assessment and song meter deployment for one day/night at four sites (totalling 75 hours). Western Grasswren were observed at one site and detected via song meter at three sites in December 2023. The sites were considered sub-optimal, but add to the extension of species range to the east of Lincoln Highway. Habitats that the species was detected in included Chenopod Shrubland, Western Myall +/- Black Oak Bullock Bush over Chenopods, and Western Myall over Chenopods. Ward's weed cover was moderate to high in some areas and a fox was sighted. The desktop study also identified one Western Grasswren record from 2023 (DEW 2024) to the east of Lincoln Highway, also within the PSL Area in similar open Western Myall over Chenopod habitat.</p> <p>Additional Malleefowl survey (March 2024). Two ecologists surveyed areas initially mapped mallee habitat (<43 ha) along Port Bonython Road (12 person hours, plus 8 person hours while doing vegetation assessments), as per relevant criteria (National Malleefowl Recovery Team 2020, DEWHA 2010). No evidence of Malleefowl was detected (e.g. mounds, tracks). Six additional BAM assessments were also undertaken, further refining the vegetation mapping within the Project Area along Port Bonython Road. Vegetation types included four mallee/low woodland transition habitats, Western Myall shrubland (regrowth) and Coastal Shrubland.</p> <p>Further survey work undertaken in August 2024. Two ecologists conducted vegetation assessments along Fitzgerald Bay Road and other gaps within Project Area (4 additional BAM assessments). Song meters were also deployed and bird surveys undertaken at those sites. Whilst no Southern Whiteface were detected, Western Grasswren were detected at two sites; along Port Bonython Road and Fitzgerald Bay Rd. Desktop and field verification was also undertaken in potential Malleefowl habitat related to Project Area shift north in Mallee habitat. This included a slow drive by search for Malleefowl Mounds, desktop analysis of LIDAR data and field verification of potential Malleefowl mounds. Whilst the vegetation is considered to represent foraging habitat for Malleefowl, no individual birds or mounds were detected in the Disturbance Footprint.</p>

1.7 Existing environment description

The Interim Biogeographic Regionalisation for Australia (IBRA) describes land for conservation under Australia's Strategy for the National Reserve System (Thackway and Creswell 1995). The IBRA classifies Australia into 89 bioregions and 419 subregions. Each bioregion is a distinct area characterised by geology, landform patterns, climate, ecological features, and plant and animal communities. Broadly, the Study Area occurs across a single IBRA Region, Gawler (GAW) and two IBRA Subregions, Arcoona Plateau and Myall Plains. Further subdivisions within these subregions, in terms of vegetation and other landscape context factors are used in calculating offset areas for clearance approved under the *Native Vegetation Act 1991* (SA).

The majority of the PSL Area and surrounds is mapped as remnant native vegetation based on the Government of South Australia's Department for Environment and Water (DEW) vegetation mapping layers (Native Vegetation Cover, SA Vegetation, Coastal Saltmarsh and Mangrove Mapping from the NatureMaps database (DEW 2024). Vegetation has also been mapped following field surveys by Jacobs (2023a, 2023b, Infrastructure SA 2024) and updates by Lathwida (2024). The following broad vegetation groups are mapped as occurring within the PSL Area (Figure 1.4):

- Chenopod Shrubland (eastern end and sections of the western end of PSL Area)

Broadly comprises Pearl Bluebush (*Maireana sedifolia*) mid sparse shrubland over Ruby Saltbush (*Enchylaena tomentosa* var. *tomentosa*), Thorny Saltbush (*Rhagodia spinescens*), speargrass, (*Austrostipa* sp.) and mixed shrubs. Jacobs (2023a) confirmed this vegetation was generally present at the eastern end of the PSL Area. This mapping has also been confirmed and updated following the recent Lathwida survey (defined as Broad Community 1, 2, 4 in Table 1.3 and Figure 1.4).

- Eucalyptus Mallee Forest and Mallee Woodland (areas adjacent the center of the PSL Area, along Port Bonython Road and pockets in the southeast of the PSL Area).

Broadly comprises Yorell (*Eucalyptus gracilis*), +/- White Mallee (*E. dumosa*) +/- Gilja (*E. brachycalyx*), +/- Red Mallee (*E. oleosa* ssp. *ampliata*) mid open mallee forest over Sheep Bush (*Geijera linearifolia*), Dryland Teatree (*Melaleuca lanceolata*) shrubs over Ward's Weed - exotic (*Carrichtera annua*), speargrass, emubush, Mealy Saltbush (*Rhagodia parabolica*), Ruby Saltbush, Grey Bindyi (*Sclerolaena diacantha*) shrubs. Jacobs (2023a) confirmed this vegetation was generally present along Port Bonython Road and in patches at the eastern end of the PSL Area. This mapping has also been confirmed and updated following the recent Lathwida survey (defined as Broad Community 8 in Table 1.3 and Figure 1.4). Note there is some regrowth mallee included in this mapping, in road reserve areas along Port Bonython and adjacent samphire north of Port Bonython Road.

- Acacia Woodlands (western end of the PSL Area)

Broadly comprises Western Myall low woodland over Bladder Saltbush, Pearl Bluebush, Ruby Saltbush and Intricate Saltbush (*Rhagodia ulicina*) low shrubs. Jacobs (2023a) confirmed this vegetation was broadly present. This mapping has also been confirmed and updated following the recent Lathwida survey. Noting that these woodlands also include several other tree species in scattered patches/pockets including Black Oak, False Sandalwood and Bullock Bush (defined as Broad Community 5, 6, 7, 8, 10 in Table 1.3 and Figure 1.4).

- Casuarina Woodland (small pockets at the western end along existing pipeline)

Broadly comprises Black Oak low woodland over Sheep Bush, Spiny Fan Flower (*Scaevola spinescens*) tall shrubs over Ruby Saltbush, Balcarra Grass (*Austrostipa nitida*), +/- Silver Mulla Mulla (*Ptilotus obovatus* var. *obovatus*), +/- Pearl Bluebush, +/- Bitter Saltbush (*Atriplex stipitata*) low shrubs over Ward's Weed – exotic. Jacobs (2023a) confirmed this vegetation was present at the western end of the PSL Area. This mapping has also been confirmed and updated following the recent Lathwida survey, noting that pockets of this vegetation occur east of the Lincoln Highway, where the communities have been combined to represent the on ground scenario, i.e. within Acacia Woodlands (defined as Broad Community 8 in Table 1.3 and Figure 1.4).

- Samphire Shrubland (near salt evaporation pans centre of PSL Area, adjacent the Project Area)

Brown-head Samphire (*Tecticornia indica* ssp.), +/- Saltbush (*Maireana oppositifolia*), +/- Marsh Saltbush, +/- Bladder Saltbush low open shrubland over +/- Native Pigface. Jacobs (2023a) confirmed the presence of this community, but did not undertake detailed surveys within this vegetation type. The recent Lathwida survey confirmed the presence of this vegetation, defined as Broad Community 11 and 14 in Table 1.3 and Figure 1.4).

Described as 'stranded samphire' zone, this vegetation does not qualify as a TEC (Section 3). This vegetation is associated with the edges of the Whyalla Saltfields and inland from False Bay beach areas east and south of the PSL Area. It is noted that the Whyalla Saltfields/Saltworks/Evaporation Pans are documented as a known Coastal Wader Bird and Seabird site (DEW 2024). The artificial saltpans adjacent the PSL Area to the south / southeast are listed as known shorebird habitat in the National Directory of Important Migratory Shorebird Habitat (Weller et al. 2020). The saltpans and stranded saltmarsh are also part of an area defined as a Wetland of National Importance. The Upper Spencer Gulf (wetland # SA020) is an inverse estuary containing shallow, warm saline waters and includes intertidal mangrove forests, tidal sand and mudflats and adjacent seagrass meadows. Shorebirds (both migratory and resident) are known to visit the area. Neophema parrots (including the Orange-bellied Parrot (*N. chrysogaster*) and Blue-winged Parrot (*N. chrysostoma*) have historically (1992) been recorded at the mangrove creeks in the south, adjacent the coast (Morelli 1995).

1.8 Disturbance requirements and footprint

A construction right of way and temporary clearance of a 50 m wide corridor will be required to construct a buried pipeline for the WHP. This will include windrows and soil stockpiles to enable progressive rehabilitation and return the soil and vegetative matter to the location in the reverse order of clearance. Where feasible during detailed design, the right of way will be reduced to less than 50 m. This is a conservative measure and in reality, will be minimised, wherever possible.

As of November 2024, the total temporary Disturbance Footprint for the Project has been estimated to be 102.17 ha. The majority of this new disturbance within this footprint will be rehabilitated other than the permanent facilities, which area estimated to be 0.16 ha, i.e. almost 99% within Chenopod Shrubland areas, as maintenance tracks along the pipeline are not required. Occasional access will be required for routine maintenance and in the event of an emergency which may include driving over the route in four-wheel-drive (or walking/using a drone), but this will not require dedicated tracks as it is anticipated that

existing roads or tracks will be used where possible. It is noted that there is existing disturbance (e.g. tracks, cleared areas) aligning with the proposed pipeline; approximately 32 ha. The estimated footprint of new disturbance is 102 ha as shown in Figure 1.4. A summary of temporary and final disturbance estimates is provided in Table 1.2.

Table 1.2: Summary of disturbance estimates

Disturbance type	Disturbance Estimate (ha)	
Existing disturbance	31.99	
Temporary disturbance	134.17	
Total new disturbance		102.17
Permanent disturbance		0.16

A summary of vegetation types that will be impacted by the proposed pipeline is provided in Table 1.3.

Broadly, the 134 ha Disturbance Footprint includes approximately 32 ha of existing disturbance, and 102 ha of new disturbance, including 26 ha of mallee, ~35 ha of suitable Western Grasswren habitat and ~41 ha of low suitability Western Grasswren habitat. Of this temporary disturbance, over 99% will be rehabilitated, the residual impact being 0.16 ha of permanent disturbance (in low suitability Western Grasswren habitat, low suitable general Southern Whiteface habitat will be impacted). Impacts to these species are considered negligible and discussed further in Section 3 and Section 4.

The total Disturbance Footprint represents direct impacts to native vegetation and fauna habitat in the Project Area. Other direct impacts as a result of construction include potential impact pathways such as vehicle strike to fauna. Additional indirect impacts are also plausible, such as dust deposition on vegetation resulting in a decline in vegetation health, weed introduction resulting in reduced habitat quality, or construction light, noise or vibration disturbance resulting in avoidance of habitat or less successful breeding. All plausible impact pathways (both direct and indirect) are considered where relevant in this assessment (Section 4 provides additional detail for the species that are known to occur in the Project Area only).

The compressor station and inlet facility will be within the footprint of the Government of South Australia's Whyalla Hydrogen Facility and are not included in the Disturbance Footprint for the Project. The Project would not result in additional or increased impacts at this site beyond those that have been considered in the referral for the Whyalla Hydrogen Facility (including vegetation clearance and noise from compression facilities). These impacts would occur regardless of whether the Project proceeds. Consequently, impacts at the Whyalla Hydrogen Facility site from the Project have not been considered in this this assessment.

Relevant regulatory approval documents for the Project will include an Environmental Impact Report (EIR), a Statement of Environmental Objectives (SEO) and a pipeline licence application (PLA) under the *Energy Resources Act 2000* (SA), together with a Construction Environmental Management Plan (CEMP) and an Operational Environmental Management Plan (OEMP). These documents will provide further detail about the disturbance and mitigation measures.

Table 1.3: Approximate areas of vegetation communities within PSL Area, Project Area and Disturbance Footprint

Broad Vegetation Group	Broad Vegetation Community	Total Vegetation Area within PSL Area (ha)	Project Area	Total Disturbance Footprint (ha)	Existing Disturbance (ha)	New Disturbance (ha)
Chenopod Shrubland	1. Chenopod / Samphire Low Open Shrubland on plains	256.12	85.40	19.04	3.99	15.06
	2. Chenopod Open Shrublands +/- Emergent Trees (e.g. False Sandalwood)	211.17	67.670	0.02	0.01	0.00
	4. Low Open Chenopod Shrublands	2,593.03	302.69	27.32	4.24	23.09
Acacia Woodlands (+/- Black Oak/False Sandalwood/Bullock Bush)	5. Low open woodlands of Western Myall +/- False Sandalwood over Chenopods	120.28	0.60	0.00	0.00	0.00
	6. Low open woodlands of Western Myall over Chenopods	104.18	31.64	8.42	1.63	6.79
	7. Low open woodlands of Western Myall +/- Black Oak over Chenopods	527.65	185.08	15.20	4.19	11.01
	13. Western Myall low open woodlands +/- Black Oak/Bullock Bush/False Sandalwood	1,135.67	470.47	26.49	10.49	16.00
Mallee	8. Mallee with an open sclerophyll shrub over Chenopods on sand plains/ low dunes over calcareous loams	564.20	305.99	31.65	6.07	25.58
Samphire/Saltmarsh	12. Samphire +/- Chenopod shrublands with infrequent inundation/saline soils	882.99	8.77	3.32	0.52	2.80
Mixed Shrubland	3. Mixed shrublands in ephemeral drainage lines	66.04	13.61	1.75	0.31	1.44
Coastal Shrubland	11. Coastal tall shrubland	14.25	10.89	0.85	0.41	0.44
	Total	7,232.61	1,508.5	134.17	31.99	102.17
	Permanent Disturbance					0.16

Minor differences are related to rounding. Note there are ~ 757 ha mapped in the PSL Area and 26 ha unmapped in the Project Area (refer Figure 1.4)

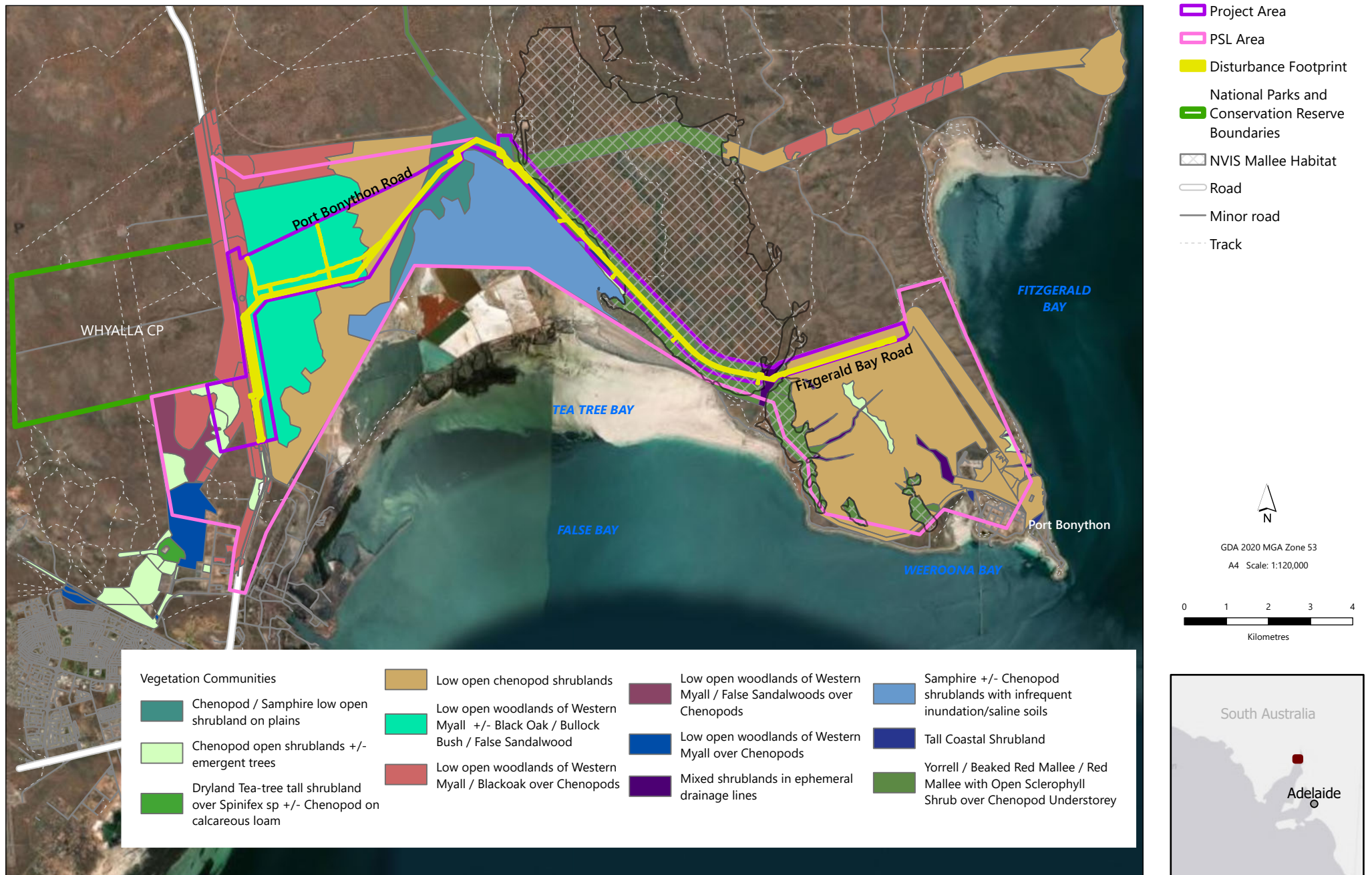


Figure 1.4: Disturbance Footprint and vegetation communities

2 Methodology

2.1 Approach to Significant Impact Assessment

This document draws upon existing reports and information available at the time of preparation, including baseline assessments and targeted surveys for the WHP Project (Lathwida 2024b), along with the HJP habitat assessments for conservation significant species (Jacobs 2023a, 2023b), vegetation mapping (Jacobs 2023a, 2023b, Infrastructure SA 2024) and targeted surveys (EBS 2023). A summary of previous studies undertaken is outlined in Table 1.1.

Several PMST outputs have been undertaken during baseline ecological desktop studies for the HJP (Jacobs 2023a, 2023b, Infrastructure SA 2024) and have been considered, however, for the purpose of this assessment the most recent PMST output from 31 January 2024 (Appendix A) has been used. The PMST output is inclusive of the Study Area which is a 5 km buffer surrounding the PSL Area at the time of the assessment (Figure 1.1). All MNES identified in the PMST outputs have been considered.

The assessment is undertaken in the following structure:

- Criteria used to assess the potential impact for threatened species are outlined in Section 2.2.3.
- Assessment of all relevant terrestrial species is presented in Section 3.
- Additional supporting information for the three identified MNES species that are known to occur in the PSL Area, as disturbance (primarily temporary disturbance) will occur in suitable habitat for the species is provided in Section 4.
- Other matters protected by the EPBC Act are addressed in Section 5.

2.2 Desktop assessment

To support this significant impact assessment, DCCEEW's PMST was used to produce a list of terrestrial MNES which are relevant to the PSL Area (Appendix A). A final search of the Protected Matters database was undertaken 31 January 2024 for the Study Area (Figure 1.1).

To determine MNES species relevant to the Project Area, a review of previous ecological studies was undertaken, including a review of desktop studies as outlined in Section 1.6. The review focussed on all terrestrial species which are known and/or likely to occur within the Project Area. All marine (oceanic species) MNES species were excluded from the results as these species are either unlikely to occur within the terrestrial PSL Area (or Project Area) due to a lack of suitable or critical habitat or have not been recorded within or adjacent the PSL Area. Marine species that were excluded include marine mammals, marine turtles, sharks, fishes and birds which utilise oceanic habitats (e.g. albatrosses, petrels, fairy prions, shearwaters).

In summary, the desktop assessment included:

- a review of the following documents and databases:
 - PMST output (Study Area on 31 January 2024) (Appendix A)
 - Biological Databases of South Australia (BDBSA) records and relevant layers within the DEW NatureMaps database (BDBSA 2023, DEW 2024)
 - Atlas of Living Australia (ALA), where necessary for species distributions or where additional species information is available
 - previous studies in and adjacent the PSL Area (e.g. Jacobs 2023a, 2023b, Infrastructure SA 2024; EBS 2023)
 - publicly available species literature (e.g. Species Profiles and Threat Database (SPRAT) profiles, Threatened Species Conservation Advice and Recovery Plans)
- a likelihood of occurrence assessment for species considered to have potential to occur in the PSL Area as per PMST output (Section 2.2.1 for criteria and exclusions)
- a significant impact assessment for species considered to have real potential to occur following likelihood assessment (Section 2.2.3 for criteria).

Note the outcomes of the likelihood assessment and significant impact assessment are combined in Table 3.2 in Section 3.

2.2.1 Likelihood assessment

As above, the likelihood assessment included review of background data and reports relevant to the PSL Area. Following review of the PMST output, background data and reports, the criteria summarised in Table 2.1 were applied to determine the likelihood of occurrence within or immediately adjacent the PSL Area (e.g. for shorebirds). Forty-four marine species were excluded from assessment (Table 2.2).

Table 2.1: Likelihood of occurrence criteria

Likelihood of Occurrence	Definition
Does not occur	No recent (1995 or more recent) or historic records (older than 1995) of the species in the Project Area, or within 5 km of the PSL Area. No suitable habitat for the species within the PSL Area. Mapped species distribution does not overlap with the PSL Area.
Unlikely	No recent records (1995 or more recent) of the species in the PSL Area, or in surrounding areas. No historic records (older than 1995) of the species in the PSL Area, but historic records exist within surrounding areas. No suitable habitat for the species in the PSL Area, or suitable habitat which is present is highly disturbed or degraded. Project Area is on the fringe of the mapped species distribution and the distribution only potentially overlaps with the PSL Area.
Potential	No recent records (1995 or more recent) of the species in the PSL Area, or in surrounding areas. No historic records (older than 1995) of the species in the PSL Area, but historic records exist within surrounding areas. Suitable habitat for the species exists in the PSL Area. Project Area is within the mapped species distribution.
Likely	No recent records (1995 or more recent) of the species in the PSL Area, however there are recent records within 10 km of the PSL Area. Historic records (older than 1995) may exist in the PSL Area and/or in surrounding area. Important habitat for the species (for foraging or breeding) is present in moderate to good condition within the PSL Area. Known species distribution overlaps with the PSL Area.
Known	Species has been recently (1995 or more recent) recorded in the PSL Area. Important habitat for the species (for foraging or breeding) is present within the Project Area. Known species distribution overlaps with the Project Area.

2.2.2 MNES species relevant to the Project

From the desktop review a number of previous ecological reports were drawn upon to consider species listed under the EPBC Act relevant to the PSL Area, and to ascertain their likelihood of occurrence based upon previous records, vegetation and habitat survey/mapping, and targeted bird surveys. From this body of work, and the most recent PMST assessment (Appendix A), a total of 41 MNES species, and one TEC have been identified as potentially relevant to the PSL Area. A summary of the number of MNES identified from the 31 January 2024 PMST output is provided in Table 2.2.

A combined likelihood summary of all 41 species considered relevant to the terrestrial/coastal location of the PSL Area, with a significant impact assessment is provided in Table 3.2.

The criteria used for the significant impact assessment are discussed in Section 2.2.3 and outcomes presented in Section 3. The significant impact assessment component is undertaken at a high level for all terrestrial and migratory species considered known, likely or with potential to occur in the PSL Area (or immediately adjacent for migratory species). Following this, a more detailed assessment is provided for the three MNES species known to be present and having habitat in the Project Area, including detail about discrete vegetation clearance; the Western Grasswren, the Southern Whiteface and the Malleefowl.

Table 2.2: Summary of the PMST outcomes

MNES	2024 PMST Results (January)
Listed TECs	1
Listed threatened species	50*^
Listed migratory species	45**
Wetlands of international importance (Ramsar)	None
Commonwealth marine areas	None
World heritage properties	None
National heritage places	1
The Great Barrier Reef Marine Park	None

*Note nine species (Red Knot, Ruddy Turnstone, Latham's Snipe, Curlew Sandpiper, Great Knot, Greater Sand Plover, Common Greenshank, Eastern Curlew, Sharp-tailed Sandpiper) are listed under both threatened and migratory MNES categories, but are only considered further / counted once within this report (under threatened).

^22 of these species (marine mammals, marine reptiles and oceanic birds) were excluded from the assessment and not considered further.

**23 of these species (marine mammals, sharks and fishes, marine reptiles and oceanic birds) were excluded from the assessment and not considered further. Marine birds include those which primarily utilise oceanic habitats (e.g. albatrosses, petrels, fairy prions, shearwaters).

2.2.3 Significant Impact Criteria relevant to MNES species

The Project is expected to interact with, or may potentially interact with, the following MNES:

- listed threatened species and ecological communities
- listed migratory species.

Although 22 threatened marine species and 23 migratory marine species are also flagged as potentially relevant to the PSL Area by the PMST, they are considered unlikely to occur in the terrestrial PSL Area and, very unlikely to occur in the discrete terrestrial locations proposed for disturbance in the Project Area. They were therefore excluded in this significant impact assessment.

The significant impact criteria for threatened species are outlined by DotE (2013) and are summarised below. In assessing whether construction and operation activities are likely to have a significant impact on MNES, the nature and magnitude of potential impacts were considered, as outlined by DotE (2013). The nature and magnitude of an Action's impacts, include matters such as:

- the sensitivity of the environment which will be impacted
- the timing, duration and frequency of the Action and its impacts
- all onsite and offsite impacts
- all direct and indirect impacts
- the total impact which can be attributed to the Action over the entire geographic area affected, and over time
- existing levels of impact from other sources, and
- the degree of confidence with which the impacts of the Action are known and understood.

Threatened species

The significant impact criteria applied to threatened species differ depending on the conservation rating of the threatened species. Those which are listed as Critically Endangered or Endangered are assessed against one set of criteria (Table 2.3), and those which are listed as Vulnerable are assessed against another set of criteria (Table 2.4).

When considering the threatened species criteria for critically endangered, endangered or vulnerable threatened species, a ‘population’ of a species as defined under the EPBC Act is an occurrence of the species in a particular area, including, but not limited to (DotE 2013):

- a geographically distinct regional population, or collection of local populations, or
- a population, or collection of local populations, that occur within a particular bioregion.

For species listed as Vulnerable, the term ‘important population’ is used to define a number of the significant impact criteria. An ‘important population’ is defined as a population that is necessary for a species’ long-term survival and recovery (DotE 2013), and may include populations identified by recovery plans and/or that are:

- key source populations either for breeding or dispersal
- populations that are necessary for maintaining genetic diversity and/or
- populations that are near the limit of the species range.

Examples of populations that do not represent important populations would include small portions of much larger and/or predominantly continuous populations, or discrete populations as part of a larger patchy population distribution because of natural habitat variability and islanding of microhabitat features.

Table 2.3: Significant impact criteria for critically endangered or endangered species

Criteria reference used in assessment	Criteria
A	Lead to a long-term decrease in the size of a population
B	Reduce the area of occupancy of the species
C	Fragment an existing population into two or more populations
D	Adversely affect habitat critical to the survival of a species
E	Disrupt the breeding cycle of a population
F	Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline
G	Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species’ habitat
H	Introduce disease that may cause the species to decline
I	Interfere with the recovery of the species

Table 2.4: Significant impact criteria for vulnerable species

Criteria reference used in assessment	Criteria
A	Lead to a long-term decrease in the size of an important population of a species
B	Reduce the area of occupancy of an important population
C	Fragment an existing important population into two or more populations
D	Adversely affect habitat critical to the survival of a species
E	Disrupt the breeding cycle of an important population
F	Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline
G	Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat
H	Introduce disease that may cause the species to decline
I	Interfere substantially with the recovery of the species

Listed migratory species

The significant impact criteria applied to listed migratory species are presented in Table 2.5. DotE (2013) provide further details on what constitutes important habitat for migratory species, and how to define a population of a migratory species.

Table 2.5: Significant impact criteria for migratory species

Criteria reference used in assessment	Criteria
A	Substantially modify (including by fragmenting, altering fire regimes, nutrient cycles or hydrological cycles), destroy or isolate an area of important habitat for a migratory species
B	Result in an invasive species that is harmful to a migratory species becoming established in an area of important habitat for migratory species
C	Seriously disrupt the life cycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of a population of a migratory species

3 Impact assessment of all species

A summary of the likelihood assessment and significant impact assessment combined for all species relevant to the Project Area (that is within the PSL Area or immediately adjacent) is provided in Table 3.2. Species that were considered to potentially occur or use habitat in the Project Area and proposed disturbance area included: Western Grasswren, Malleefowl, Southern Whiteface, Yellow Swainson Pea, Grey Falcon, and Blue-winged Parrot. However, only the first three are **known** to occur, and have habitat that will be disturbed in the PSL Area, or the Project Area, hence additional assessment is provided in Section 4 (e.g. Western Grasswren, Southern Whiteface and Malleefowl).

A number of threatened and migratory or resident shorebirds/beach nesting birds are known to occur or potentially occur in the Whyalla Saltfields, False Bay Beaches and potentially stranded saltmarsh adjacent the PSL Area and Project Area; Red Knot, Curlew Sandpiper, Great Knot, Greater Sand Plover, Bar-tailed Godwit, Eastern Curlew, Fairy Tern, Hooded Plover, Common Sandpiper, Ruddy Turnstone, Sharp-tailed Sandpiper, Sanderling, Pectoral Sandpiper, Red-necked Stint, Oriental Plover, Latham's Snipe, Pin-tailed Snipe, Ruff, Common Greenshank and Marsh Sandpiper. As per the individual assessments (threatened species) and functional group assessment (migratory species), no significant impacts are expected to any of these resident or migratory shorebirds/beach nesting birds, given shorebird habitats will be avoided.

Indirect impacts to shorebirds are considered unlikely given the shorebird habitats adjacent the PSL Area are generally distant from the pipeline alignment (and on the opposite side of a major road). There is very limited shorebird habitat (e.g. stranded Saltmarsh) in close proximity to the pipeline alignment, and very large areas of habitat (e.g. ocean beaches with seagrass) present that are distant from the alignment. There is also very limited drainage from the Project Area to shorebird habitats, as it is separated from them by Port Bonython Road and there are very few culverts under the road, and surface gradients are very low, so there is no realistic potential for indirect impacts from sediment and erosion from pipeline construction. The potential for impact to threatened or migratory species is also based on the assumption that the Project mitigation measures have been implemented. These measures are outlined in Table 3.1 and referred to in the assessment table (Table 3.2)

Table 3.1: Project generic mitigation measures

Mitigation Measure #	Mitigation measure description
1.	Desktop and field surveys carried out to identify key ecological constraints, informing design options to avoid and minimise interaction with important habitat as far as reasonably practicable.
2.	Where the construction footprint comes within proximity to, key habitats supporting EPBC species or communities, the construction footprint boundary will be delineated to avoid unintentional disturbance outside of defined construction areas.
3.	A walk through will be undertaken with an experienced ecologist, arborist and construction design specialist in order to further reduce the construction right of way, where possible and to assist with demarcation of no-go zones for particularly sensitive areas.
4.	Preparation of a project-specific CEMP including sediment and erosion control measures, controls on activities near salt pans and clay pans, weed hygiene, weed monitoring and progressive rehabilitation of all temporary construction areas. Weed monitoring targeting Weeds

Mitigation Measure #	Mitigation measure description
	<p>of National Significance (WoNS) and Declared Weed species, with follow up controls as required for any identified weed outbreaks.</p> <p>Use of existing disturbance corridors wherever possible (i.e. road corridors, tracks, rail corridors, other utilities corridors,).</p> <p>Preparation of a Threatened Species Management Plan (TSMP) as a sub-plan to a detailed and project-specific CEMP. As a minimum include:</p> <ul style="list-style-type: none"> • pre-construction inspection of any areas with suspected EPBC species or habitat prior to commencement of access and clearing activities • development and implementation of waste management protocols to avoid an increase in, or attraction of, feral pest animals to the Project Area • speed restrictions within construction areas and along access tracks • implementation of weed hygiene practices including: vehicle checks and washdowns as required on vehicles or plant entering the construction site • weed surveillance monitoring targeting WoNS and Declared Weed species, with follow up controls as required for any identified weed outbreaks.
5.	Disturbance along the pipeline alignment will be revegetated through reinstating topsoil and cleared vegetative material to encourage natural regeneration, and additional reseeded with selected local species that match the vegetation communities traversed. Seed species selection will favour, where feasible, vulnerable fauna such as Western Grasswren, Southern Whiteface and Malleefowl.
6.	Operations Environmental Management Plan (OEMP) prepared and implemented prior to commissioning (e.g. include weed surveillance and control programs targeting WoNS and Declared Weed species (if weeds identified) on an annual basis).
7.	Offset all Native Vegetation Clearance as per the state <i>Native Vegetation Act 1991</i> (SA) requirements and the Significant Environmental Offset Policy (Native Vegetation Council 2020a, 2020b, 2020c, 2020d).

Table 3.2: Summary of likelihood assessment and significant impact assessment for PSL Area and Project Area

Species, or Community	EPBC Act ¹	NPW Act ²	Likelihood of Occurrence	Potential Impacts	Mitigations Measures	Significant Impact Assessment (impacts following project mitigation measures)
Threatened Ecological Communities						
Subtropical and Temperate Coastal Saltmarsh	VU	-	<p>PMST output states that community is likely to occur within the PSL Area (Appendix A, DCCEEW 2023).</p> <p>Route selection of the pipeline alignment has actively sought to avoid this community, including alternatives discussed in Section 1.</p> <p>Surveys in the centre of the PSL Area have found the absence of key vegetation species and/or conditions that are representative of this TEC (Lathwida 2024). Areas of stranded saltmarsh which occur adjacent the southern boundary of the centre of the PSL Area (Figure 1.4) also have cultural significance and are avoided by the Project alignment, with the exception of a fragment north of Port Bonython Road. Small areas that may be impacted (<3.3 ha in total) occur on inland saline soils with no tidal connection, are disconnected artificially from a tidal regime, hence do not meet the TEC criteria for Subtropical and Temperate Coastal Saltmarsh.</p> <p>Areas mapped as samphire also include areas that are associated with claypans and saltpans, some of which have been artificially quarried. These areas overlap with Cultural Areas and will be avoided by the Project.</p> <p>The saltmarsh vegetation that is present would represent a buffer to the TEC that is present south/south-east of the PSL Area adjacent the Whyalla artificial saltpans.</p> <p>This TEC is considered as potentially occurring immediately adjacent the PSL Area or the Project Area.</p>	<p>Direct temporary loss of ~ 2 ha of buffer habitat (stranded salt marsh). The habitat may connect via underground drainage to stranded saltmarsh south of Port Bonython Road, that is contiguous with Coastal Saltmarsh TEC that occurs adjacent False Bay.</p> <p>Potential indirect impacts through increased weed incursion.</p>	Refer Table 3.1, measures 1, 2, 3, and 4.	<i>Potential impacts to a Vulnerable TEC do not require approval under the EPBC Act.</i>
Threatened Flora						
Greencomb Spider-orchid, Rigid Spider-orchid (<i>Caladenia tensa</i>)	EN	-	<p>PMST output suggested may occur in the PSL Area (Appendix A).</p> <p>Perennial winter active orchid, growing to 35 cm, in sandy loams derived from Aeolian deposits, in Cypress Pine (<i>Callitris spp.</i>), Blue Gum (<i>Eucalyptus leucoxylon</i>) woodland and Broombush (<i>Melaleuca uncinata</i>) mallee (TSSC 2016).</p> <p>Taxonomy assessment concluded that it is widespread in eastern SA (Cape Gantheaume CP, Billiat CP and the Mount Boothby CP).</p> <p>There are no previous records within 5 km of the PSL Area (for any <i>Caladenia</i> sp.) (BDBSA 2023). Not detected during previous surveys (Jacobs 2023a 2023b, Infrastructure SA 2024, EBS 2023) or recent survey (Lathwida 2024b) and suitable habitat not present.</p> <p>Species is considered unlikely to occur in the PSL Area and the Project Area.</p>	Unlikely to occur, N/A	None required.	<p>No Significant Impacts Expected</p> <p>Criteria A, B, C, D, E, F, G, H and I not likely to be triggered as species is considered unlikely to occur in the Project Area.</p>
Braided Sea Heath (<i>Frankenia plicata</i>)	EN	V	<p>PMST output suggested may occur in the PSL Area (Appendix A).</p> <p>Small arid zone shrub known from a limited number of scattered records in run-on areas across northern SA, well</p>	Unlikely to occur, N/A	None required.	<p>No Significant Impacts Expected</p> <p>Criteria A, B, C, D, E, F, G, H and I not likely to be triggered as species is considered unlikely to occur in the Project Area.</p>

Species, or Community	EPBC Act ¹	NPW Act ²	Likelihood of Occurrence	Potential Impacts	Mitigations Measures	Significant Impact Assessment (impacts following project mitigation measures)
			<p>north of Port Augusta, near Lake Torrens / Andamooka (DEWHA 2008, ALA 2024).</p> <p>Grows in a range of habitats, in a wide range of vegetation communities that have good drainage (Neagle, 2002 cited in DEWHA 2008).</p> <p>The SA Herbarium has undertaken review of lodged specimens that were mis-identified given the difficulty in separating this species from the common <i>F. serpyllifolia</i>. The SA Flora database and MNES distributions are being updated to reflect this (H Vonow, SA Herbarium Pers. Comm).</p> <p>There are no previous records within 5 km of the PSL Area (BDBSA 2023). Has not been detected in surveys to date (Jacobs 2023a, Infrastructure SA 2024, EBS 2023, Lathwida 2024b). There are two records for the common <i>F. serpyllifolia</i> from 1996, with low spatial reliability.</p> <p>Species is considered unlikely to occur in the PSL Area or the Project Area.</p>			
Desert Greenhood (<i>Pterostylis xerophila</i>)	VU	V	<p>PMST output suggested species may occur in the PSL Area (Appendix A).</p> <p>Distribution is restricted to isolated subpopulations from Eyre Peninsula (EP SA) to northwestern Victoria (ALA 2024). This includes six small populations in SA in mallee habitat with rocky outcrops and presence of Spinifex (<i>Triodia scariosa</i>) (DCCEEW 2024k).</p> <p>Difficult to detect as tubers remain dormant below ground until years with favourable rainfall and growing season only lasts a few months.</p> <p>Has been located within areas mapped as <i>Eucalyptus incrassata</i> mid mallee woodland (DEW 2024). However, it is more typically associated with Broombush tall shrubland over <i>Babingtonia behrii</i> +/- <i>Calytrix involucreata</i> low shrubs over <i>Triodia irritans</i> +/- <i>Hibbertia</i> sp., typically with granite outcropping (cited in JBSG 2022).</p> <p>Mallee mapped as occurring in the Study Area includes: <i>E. gracilis</i> +/- <i>E. dumosa</i> +/- <i>E. brachycalyx</i> +/- <i>E. oleosa</i> over Dryland Tea Tree (<i>Melaleuca lanceolata</i>) (DEW 2024). Mapping of mallee in parts of the PSL Area was confirmed in recent surveys, but species not detected to date (Jacobs 2023a, Lathwida 2024b). No granite outcropping or Spinifex occurs in the Disturbance Footprint (Lathwida 2024b).</p> <p>There are no previous records within 5 km of the PSL Area (BDBSA 2023). Not detected during surveys to date and mallee present in the centre and south of the PSL Area is not considered typical for the species, primarily <i>E. oleosa</i>.</p> <p>Species is considered unlikely to occur in the PSL Area or the Project Area.</p>	Unlikely to occur, N/A	None required.	<p>No Significant Impacts Expected</p> <p>Criteria A, B, C, D, E, F, G, H and I not likely to be triggered as species is considered unlikely to occur in the Project Area. desert</p>
Yellow Swainson-pea (<i>Swainsona pyrophila</i>)	VU	R	<p>PMST output suggests species or species habitat may occur within the PSL Area (Appendix A).</p> <p>Grows in mallee on variety of soil types including sandy or loamy soil. Has been recorded from mallee woodland with <i>Eucalyptus brachycalyx</i>, <i>E. incrassata</i> <i>E. calycogona</i>, <i>E.</i></p>	Clearance of individual plants or potential habitat for pipeline and access tracks.	Refer Table 3.1, measures 1, 2, 3, 4, and 5.	<p>Significant impacts are considered unlikely but possible.</p> <p>A. Unlikely. Yellow Swainson-pea is a short-lived species with long-term survival of populations reliant upon soil stored seed. The mitigation measures are aimed at avoiding clearance. Given the Project does not traverse a known population of this species, if</p>

Species, or Community	EPBC Act ¹	NPW Act ²	Likelihood of Occurrence	Potential Impacts	Mitigations Measures	Significant Impact Assessment (impacts following project mitigation measures)
			<p><i>dumosa</i>, <i>E. gracilis</i>, <i>E. incrassata</i>, <i>E. leptophylla</i>, <i>E. oleosa</i> and <i>E. socialis</i>, sometimes with Broombush (<i>Melaleuca uncinata</i>) tall shrubland (Tonkinson and Robertson (2010). Known to respond favourably to disturbance and after fire and subsequent rain, only living for two years after fire (Tonkinson & Robertson 2010).</p> <p>There are no records within 5 km of the PSL Area, nearest records are in Munyaroo CP and Ironstone Hill CP (BDBSA 2023, DEW 2024). Not detected during surveys to date (Jacobs 2023a, Lathwida 2024b). However, some of the preferred mallee species do occur in the PSL Area, hence considered possible. The Munyaroo Conservation Park (CP) (well southwest of the PSL Area) is noted as an important population of the species in the National Recovery Plan (Tonkinson and Robertson 2010).</p> <p>The number and size of subpopulations is unknown, given the species survives as seed in soil when above ground populations are not present. Subpopulations are thought to occur in Hambidge, Munyaroo, Heggaton and Messent CPs in SA and on private land and roadsides (DCCEEW 2024l). The PSL Area overlaps with the ‘may occur range’ (DCCEEW 2024l).</p> <p>It considered that this species has potential to occur in the PSL Area and the Project Area, but is not part of known important population of the species.</p>	Introduction of invasive weed species or disease.		<p>small scale unintentional clearance occurs, it is unlikely the Project would potentially lead to a long term decrease in the size of an important population. However, it should be noted that, any ground disturbance by the Project, including respreading topsoil may also facilitate germination of the species, if present.</p> <p>B. Unlikely. An important population is not known for the Project Area. Any new individuals detected would be avoided with the mitigation measures proposed (where possible), The Action is unlikely to lead to a reduction in area of occupancy of an existing important population. Given the species responds to disturbance, activities following construction may promote germination.</p> <p>C. Unlikely. An important population is not known for the Project Area and it is unlikely that the final underground pipeline would result in fragmentation of an existing important population. Given the species responds to disturbance, activities following construction may actually promote germination of this short-lived species, similar to what has occurred at mine areas in the Middleback Ranges west of Whyalla.</p> <p>D. Not Likely. Suitable habitat may be present in association with mallee habitat known to occur in the Project Area (306 ha) and temporary disturbance area (26 ha). However, given the absence of historic, confirmed records of the species along the alignment, mallee habitat within the Project Area may support the species, but is not considered critical to the survival of the species as a whole. In addition, the species is known to respond favourable to disturbance. With mitigation measures proposed, the Action will not significantly impact on habitat that is critical to the species survival.</p> <p>E. Unlikely. An important population is not known for the Project Area. Reproduction of Yellow Swainson Pea may be disrupted if present and not avoided during construction. Mitigation measures proposed enable any populations present to be identified and avoided, so the Action will not disrupt the breeding cycle of the species. Conversely the disturbance associated with the Project, including respreading of topsoil may promote germination of the species as has occurred at nearby mine sites on the EP.</p> <p>F. Not Likely. Mitigation measures proposed allow for minimising impacts to key mallee habitats that support the species. The Action is therefore not expected to modify or decrease the availability or quality of habitat to the extent that the species (if present) is likely to decline, let alone the species as a whole.</p> <p>G. and H: Not Likely. The project is not in a high-risk <i>Phytophthora</i> area (DIT 2021). Management measures include weed controls during and post construction as well as vehicle hygiene practices, so establishment of new weed species or diseases in the Project Area is not considered likely. The Action is therefore not expected to result in the introduction of invasive species or disease which are harmful to this threatened species or the species habitat or may cause the species as a whole to decline.</p> <p>I. Not Likely. The proposed Action will not substantially interfere with the recovery plan for this species, which largely focuses on documenting distribution and increases knowledge of this species ecology and threats (Tonkinson and Robertson 2010).</p>

Species, or Community	EPBC Act ¹	NPW Act ²	Likelihood of Occurrence	Potential Impacts	Mitigations Measures	Significant Impact Assessment (impacts following project mitigation measures)
Bead Glasswort (<i>Tecticornia flabelliformis</i>)	VU	V	<p>The PMST output DID NOT suggest the species or species habitat is known to occur within PSL Area (Appendix A). Small succulent samphire scattered in saltmarsh across Australia. Known from near Meningie in south-east to near Ceduna in far west of SA. Occurs on the margins of salt lakes, saline flats, evaporation pans and coastal saltmarshes, require occasional inundation. Prefers heavy clay soils. Most easily detected January to May (DECCEW 2024b, Carter 2010). Given the presence of salt pans (some artificial) in the Project Area, considered possible to occur, but due to stranded inundation regime, and historical sand quarrying, habitat may not be suitable. No records within 5 km of the PSL Area (BDBSA 2023), not detected during high level surveys to date (Lathwida 2024b). The only known location near the Project Area is within the saline intertidal flats and salt marshes adjacent the township of Arno Bay. The Project Area is distant from this location and saltmarsh adjacent the Project Area is not connected to tidal areas (i.e. is stranded saltmarsh habitat).</p> <p>No important populations of the species are specified in the Species Profile or Recovery Plan (DCCEEW 2024b, Carter 2010). However, the Recovery Plan (Carter 2010) indicates that there are 10 known populations of Bead Glasswort on the EP in SA, with 9 located on the west coast of the peninsula, and one population located on the eastern EP at Arno Bay, distant from the Project Area. Similarly, the species conservation advice does not indicate the PSL Area as an area where the species is known, likely or may occur (DCCEEW 2024m).</p> <p>The species is considered unlikely to occur in the PSL Area or the Project Area, but possibly occurs in adjacent saltmarsh habitats.</p>	<p>Clearance of individual plants or potential habitat for pipeline and access tracks.</p> <p>Introduction of invasive weed species or disease.</p>	Refer Table 3.1, measures 1, 2, 3, 4, and 5.	<p>No Significant Impacts Expected</p> <p>Criteria A, B, C, D, E, F, G, H and I not likely to be triggered as species is considered unlikely to occur in the Project Area.</p>
Threatened Fauna - Birds						
Western Grasswren (<i>Amytornis textilis myall</i>)	VU	V	<p>PMST output suggests that species or species habitat known to occur within PSL Area (Appendix A).</p> <p>The Western Grasswren is scattered and widespread in the Myall Creek and Pine Creek drainages of the north-eastern EP, bounded in the south by Munyaroo CP, and in the north towards Lake MacFarlane and eastern Lake Gairdner and Lake Gilles CP (Garnet and Baker 2021).</p> <p>Prefers low dense chenopod shrublands, mainly comprising Black Bluebush (<i>Maireana pyramidata</i>) and Australian Boxthorn (<i>Lycium australe</i>) and spiny shrubs, however also prefers semi-arid low open woodlands, mostly comprising Western Myall (<i>Acacia papyrocarpa</i>) and Senna shrublands (Black et al., 2009, Menkhorst et al. 2017). Preferred habitats are in drainage lines as well as low rocky hills (DotE 2014a). Core habitats are known to occur in the Whyalla to Iron Knob corridor (Garnet and Baker 2021).</p> <p>The species' conservation advice suggests all populations of the species are considered to have high conservation value and that the species occurs in severely fragmented isolated</p>	<p>Clearance of potential habitat for pipeline and access tracks.</p> <p>Introduction of invasive weed species resulting in habitat degradation.</p> <p>Increased feral animal predation and or competition.</p>	Refer Table 3.1, measures 1, 2, 3, 4, and 5.	<p>Significant impacts are considered unlikely.</p> <p>A. Not Likely. All populations of the species are considered to have high conservation value (DotE 2014). The portion of the Project Area west of Lincoln Highway overlaps with the known distribution of Western Grasswren (Black et al. 2011, Black and Gower 2017), and the species was detected during surveys for the Project east of Lincoln Highway (EBS 2023, Lathwida 2024). The Action involves temporary clearance of suboptimal, but suitable habitat in proximity to the edge of the species known range, where the species has been recently detected and where there is existing disturbance, a major highway (Lincoln Highway) and infrastructure nearby (Liberty Steelworks). There is no preferred habitat (drainage lines, with dense <i>M. pyramidata</i>) and whilst several individuals are present, they constitute a very small proportion of the wider population which extends well west through to northwest of Whyalla. Hence while a small number of individuals may be temporarily displaced, the Project is considered unlikely to result in a long-term decrease in the size of an important population (as defined by Black et al. 2009) of this species.</p>

Species, or Community	EPBC Act ¹	NPW Act ²	Likelihood of Occurrence	Potential Impacts	Mitigations Measures	Significant Impact Assessment (impacts following project mitigation measures)
			<p>subpopulations at more than 10 locations (DotE 2014a). More recently the Action Plan for Australian Birds and IUCN assessment data suggests there is one subpopulation of approximately 12,000 individuals and this subpopulation is not severely fragmented (Garnet and Baker 2021).</p> <p>Areas of Western Myall low woodland over chenopods in the Project Area west and east of Lincoln Highway provide suitable habitat, particularly where Black Bluebush is present. There are known records in such vegetation west of the highway. Over 45 recent spatially reliable BDBSA and Birdlife records (1999-2019) within 5 km of the Project Area within Whyalla CP / HA1588 / Wild Dog Hill (BDBSA 2023). In addition, more recently there are three BDBSA records (from March 2023, November 2023) east of Lincoln Highway near the proposed solar farm (DEW 2024, EBS 2023) and the species was recorded via song meter (three sites) and briefly observed at one site during surveys in December 2023 (Lathwida 2024b). The species was also detected along Port Bonython Rd and Fitzgerald Bay Road in winter 2024 (Lathwida 2024b). The records adjacent Lincoln Highway align with the eastern extent of the records.</p> <p>Well over 2077 ha of vegetation within the PSL Area is considered to provide suitable habitat for the species, but is well east of the species known range. Noting no preferred dense drainage lines with Black Bluebush occur within the Project Area. There are also 2532 ha of low open chenopod shrublands that provide low suitability habitat, also well east of the species known range. The species is unlikely to use samphire / mallee or coastal vegetation and has not been detected near Pt Bonython to date.</p> <p>This species is considered known to occur in the PSL Area and the Project Area, in localised habitat areas of Western Myall low woodlands (+/- Black Oak, False Sandalwood, Bullock Bush) over chenopod shrubs (spiny <i>Atriplex</i> spp. <i>Maireana pyramidata</i>, <i>Scaevola spinescens</i>), and Australian Boxthorn.</p>			<p>B. Not likely. The majority of the PSL Area and Project Area east of the Lincoln Highway occurs at the eastern edge of the known area of occupation of this species (Black et al. 2009), though it is noted that the portion of the PSL Area adjacent to and immediately west of Lincoln Highway overlaps with the known records of Western Grasswren and field surveys for the HJP and NWP have identified the species north and west of Whyalla (Jacobs 2023a, 2023b, Infrastructure SA 2024). The species has also recently been detected east of Lincoln Highway (EBS 2023, ALA 2024, Lathwida 2024b). Post construction and following site rehabilitation, the infrastructure (a buried pipeline) in place is unlikely to prevent local movements of this mobile species. Whilst the Action may result in a negligible short-term reduction in the Area of Occupancy (at most 0.03%) for the entire important population, (which predominantly occurs northwest of Whyalla), over the longer term such habitat clearance on the edge of the species' known Area of Occupancy is unlikely to represent a significant impact to the entire important population (Section 4.1 for further detail).</p> <p>C. Not Likely. There are well documented records largely to the west of the PSL Area, but the section east of Lincoln Highway is also within the range of the entire population.. Existing access tracks will be utilised wherever possible, and clearance for operational access tracks is not required. The hydrogen pipeline will be buried with the majority of the environment rehabilitated. Post construction, the buried infrastructure is unlikely to prevent local movements of this highly mobile species. Hence the Project is unlikely to lead to fragmentation of an important population of this species.</p> <p>D. Not likely. Whilst critical habitat has not been defined for Western Grasswren, important habitats and critical habitat plants include Black Bluebush and Native Boxthorn, and habitat of secondary importance includes low Western Myall woodlands along drainage lines and on low rocky hills (DotE 2014a). Minimal temporary new clearance (up to 76 ha (35 of suitable habitat / 41 of low suitable habitat), refer Section 4.1) of habitat will occur where the Project traverses east of Lincoln Highway and heads east to Port Bonython. There are extensive areas of suitable / suboptimal habitats for the species in this area. The Project Area (pipeline east of Lincoln Highway) does not include drainage lines, with the majority of the preferred habitat for the species occurring north / north-west/south-west of Whyalla (Figure 4.2 and Figure 4.3). The disturbance area will be on the eastern extent of the area of occupancy (Black et al. 2009). The loss of potential quality habitat has been mitigated with route selection (where possible to avoid preferred habitat, clear poorer quality habitat, protect good quality habitat). Mitigation measures (e.g. use of existing access tracks, wherever possible, new temporary tracks micro-aligned to avoid preferred habitat, weed and hygiene controls) will seek to maintain the quality of existing habitat immediately adjacent the Disturbance Area. Given the mitigation measures proposed it is considered unlikely that habitat critical to the survival of the species will be adversely affected. The pipeline will be buried, in the longer term this habitat is likely to regenerate, impacts will be</p>

Species, or Community	EPBC Act ¹	NPW Act ²	Likelihood of Occurrence	Potential Impacts	Mitigations Measures	Significant Impact Assessment (impacts following project mitigation measures)
						<p>short-term and the area of impact will be minimised as much as possible. Habitat suitable for the species is widespread in the vicinity of the Project and the broader region, and the area of clearance for the project represents a very small proportion of available habitat (e.g. 0.03% of the AOO and 0.003% of the EOO). Consequently, the Project is expected to have a negligible impact on habitat critical to the survival of the species.</p> <p>E. Not Likely. Well documented records for the entire population occur largely to the west of the Project Area, near Whyalla (BDBSA 2023, DEW 2024, ALA 2024). The project will require temporary new clearance of a very small 0.03% (up to 76 ha, of suitable and low suitability habitat) of the area occupied by the species, at the eastern extent of its range. Large intact areas of preferred habitat remain within the DoD Cultana Training Area and the Whyalla Conservation Park. Once constructed, the buried pipeline and existing access tracks / very low traffic volume for maintenance access are not expected to disrupt movement across the landscape for this species, hence impacts to the breeding cycle of an important population are not anticipated.</p> <p>F. Not Likely. Minimal temporary clearance of suitable suboptimal habitat may occur where the Project Area traverses east of Lincoln Highway and heads east and where it traverses south to the adjacent highway. There are extensive areas of suboptimal habitat between a noisy highway, steelworks, proposed solar farms and few recent records for the species in this area. The Project Area (east of Lincoln Highway) avoids drainage lines that contain the majority of the preferred/critical habitat for the species. The loss of lower quality suitable habitat will be mitigated with route selection, SEB offset, rehabilitation, use of existing tracks, micro-alignment of any new temporary tracks, weed and hygiene controls. Given the mitigation measures proposed it is considered unlikely that habitat will be modified, destroyed, isolated or decreased to the extent that the species is likely to decline. Given the pipeline will be buried, in the longer term this habitat is likely to rehabilitate, and will continue to be contiguous with extensive areas of suitable habitats that occur across the EP.</p> <p>G and H. Not Likely. Standard controls are proposed during construction and operation phases to address the potential for impact from invasive species or diseases. As such, any introduction of weeds would not result in establishment and degradation of preferred habitat. Predation from cats and foxes already exists in the region, along with grazing pressure from native, domestic and feral animals (e.g. kangaroos, sheep, goats and rabbits). Management measures include weed and pest controls during and post construction as well as vehicle hygiene practices, so establishment of new weed and pest species or diseases in the Project Area is not considered likely. The Action is therefore not expected to result in the introduction of invasive species or disease which may cause this threatened species to decline.</p> <p>I. Not Likely. There is no recovery plan for the species, but key objectives of recovery of this species involve conserving extant populations (DotE 2014a). The key populations/records of this species occur west of the PSL Area (Black et al. 2009 2011, ALA 2023). Key recovery Actions include protecting preferred habitat,</p>

Species, or Community	EPBC Act ¹	NPW Act ²	Likelihood of Occurrence	Potential Impacts	Mitigations Measures	Significant Impact Assessment (impacts following project mitigation measures)
						locating additional populations, research into impacts of grazing and predation (DotE 2014a). Additional mitigation measures are therefore proposed to avoid any potential impact to this species, that could by extension impact the recovery of this species. As such, the proposed Action will not substantially interfere with the recovery of the species.
Southern Whiteface (<i>Aphelocephala leucopsis</i>)	VU	-	<p>PMST output suggests species or species habitat known to occur within PSL Area (Appendix A).</p> <p>Species was added to the threatened fauna list under the EPBC 31 March 2023 (DCCEEW 2023b). Extremely widespread species</p> <p>Occurs across most of mainland Australia south of the tropics in a wide range of open woodlands and shrublands where there is an understorey of grasses or shrubs, or both. Usually in habitats dominated by Acacias or Eucalypts on ranges, foothills and lowlands, and plains (Higgins & Peter 2002, cited in DCCEEW 2023b). Prefer low tree densities and herbaceous understory / litter cover for foraging. Living and dead trees with hollows and crevices are used for roosting and nesting (DCCEEW 2023b).</p> <p>Recent BDBSA records within 5 km of (western end of Project Area) and adjacent the Study Area in Whyalla CP (14 spatially reliable, BDBSA 2023). 25 Birdlife records in total, but only 8 are spatially reliable (1999-2020) (BDBSA 2023).</p> <p>There is suitable habitat across the Project Area (Chenopod / Western Myall Woodlands and Mallee). Whilst species was not detected during recent surveys, has been detected more broadly across the region for NWP and mining projects.</p> <p>No important populations are defined in the species' Conservation Advice and the species has no conservation listing in SA. Habitat deemed critical for the survival of the species is defined as areas of relatively undisturbed open woodland and shrublands with an understorey of grasses of shrubs, habitat with low tree densities and an herbaceous understorey litter overs which provides essential foraging habitat, and living and dead trees with hollows and crevices which are essential for roosting and nesting (DCCEEW 2023b).</p> <p>There are records of Southern Whiteface from across the southern (approximately) two-thirds of Australia, excluding southwest Western Australia.</p> <p>There are two subspecies; <i>A. l. castaneiventris</i> (occurs in central and southern Western Australia) and <i>A. l. leucopsis</i> (occurs in eastern WA to southern NT, southern Queensland all of SA and NSW, and northern Victoria (Menkhorst et al. 2017, DCCEEW 2023b).</p> <p>Refer Section 4.2 for further detail about AOO.</p> <p>Given the extremely broad distribution of Southern Whiteface across much of southern Australia, presence of suitable habitat and records in the PSL Area, the Southern</p>	<p>Clearance of potential habitat for pipeline and access tracks.</p> <p>Introduction of invasive weed species resulting in habitat degradation.</p> <p>Increased feral animal predation and or competition.</p>	Refer Table 3.1, measures 1, 2, 3, 4, and 5.	<p>No significant impacts expected.</p> <p>A. Not Likely. No important populations of Southern Whiteface are identified in the recent Conservation Advice for the species (DCCEEW 2023b). However, two subspecies are known, with the subspecies that occurs in SA estimated to have a larger population than the WA sub species. The species is widespread across much of Australia (excluding the tropics) favouring a broad range of habitats including open woodlands and shrublands with grassy or shrub understorey and an intact litter layer. Within the PSL Area and Project Area this includes vegetation such as Western Myall Chenopod shrublands +/- False Sandalwood / Bullock Bush / Black Oak and mallee areas (~2500 ha within the PSL Area and 1100 ha within the Project Area). Individuals present within the Project Area likely part of the continuous population of subspecies <i>A. l. leucopsis</i> that occurs across SA, NSW, Qld and Victoria, rather than part of a specifically identified important population. The Project disturbance is primarily for a buried pipeline, which will be rehabilitated via regeneration with shallow rooted species only, and the species has a large AOO (7,000,000 ha). At the regional level the Gawler Bioregion AOO is 375,600 ha across an EOO of 15,085,800 ha (ALA 2024). The impacts are considered negligible, given they represent 0.001% of the species' National AOO and 0.02% of the Gawler Bioregion AOO, hence are unlikely to result in a long-term decrease in the size of an important population.</p> <p>B. Not Likely. No important populations are defined for the Southern Whiteface in the recent Conservation Advice, and the species is broadly distributed as two sub species with one occurring in WA and the other a continuous population across much of Australia south of the tropics. Numerous areas of potentially suitable habitat for the species occur within the Project Area, including areas of chenopod shrubland with Western Myall, Black Oak, Bullock Bush and False Sandalwood. open woodland and tall shrublands, and mallee areas. These areas align with numerous historic records of the species across the majority of the Project Area. Clearance for the project has potential to incur short-term impacts in the AOO of this species through habitat clearance (e.g. 84 ha, 0.001% of National AOO, 0.02% of Gawler Bioregion AOO, refer Section 4.2), including low suitable habitat. However, the impacts are considered negligible compared with the overall area of occupancy of the species across much of southern Australia, and are not considered significant.</p> <p>C. Not Likely. Whilst the Project Area may be considered to be within the extent of occurrence of the species, no important populations are defined in the Conservation Advice, and the species occurs as subspecies with a continuous population across much of Australia south of the tropics. The Project Area represents a fraction of the overall distribution of the species across much of Australia, and does not cut any known population in two.</p>

Species, or Community	EPBC Act ¹	NPW Act ²	Likelihood of Occurrence	Potential Impacts	Mitigations Measures	Significant Impact Assessment (impacts following project mitigation measures)
			Whiteface is considered as known to occur along parts of the Project alignment, particularly the western end of the PSL Area, but is also highly likely in the eastern end of the PSL and within the Project Area.			<p>Although the Project will result in removal of suitable habitat for the species, once constructed, the underground pipeline will not stop movement of the species, or restrict gene flow. Potential impacts as a result of the Project are the clearance of habitat for the pipeline which will be predominantly rehabilitated following construction, and represent only very small areas compared to the much broader species distribution across much of Australia (0.000002% permanent habitat loss). The Project is considered unlikely to cause fragmentation of any population (or an important population) into two or more populations.</p> <p>D. Not Likely. Habitat deemed critical to the survival of the species includes areas of undisturbed open woodland and shrublands with an understorey of grasses of shrubs, habitat with low tree densities and herbaceous understorey / litter cover which provides essential foraging habitat. Living and dead trees with hollows and crevices which are essential for roosting and nesting (DCCEEW 2023b). Such habitat is widespread within and surrounding the Project Area. As such, the Project may be considered to trigger this significant impact criteria as a result of the potential to adversely affect habitat which is documented (DCCEEW 2023b) as critical to the survival of the species, despite being widespread across large portions of Australia. However, the impacts are considered negligible (e.g. 68 ha) given temporary disturbance represents 0.001% and permanent disturbance represents (0.000002)% of the species' AOO. Hence the project is considered unlikely to adversely affect habitat critical to the survival of the species such that it results in a significant impact.</p> <p>E. Not Likely. As above, no important populations of the species are identified in the recent conservation advice for the species (DCCEEW 2023b), and the species has a very broad distribution across mainland Australia. Habitat deemed critical for roosting and nesting (open woodland and shrubland with hollows and crevices, fence posts and other artificial structures with crevices). Impacts to this type of habitat within the Project Area are limited compared to the broader availability of similar habitat adjacent the proposed Project Area. Once constructed, Southern Whiteface will move freely across the Project Area. Isolated clearance of suitable breeding habitat is not expected to disrupt the breeding cycle of an important population of this species.</p> <p>F. Not Likely. As above, the Project is expected to impact upon open woodland or shrubland habitat preferred by the species, however this is only potentially small patches of habitat compared with what is available across the species distribution across large parts of Australia. The species occurs broadly across much of mainland Australia, and therefore any impacts resulting to preferred habitat from the Project are unlikely to significantly impact on habitat availability or quality to an extent which will lead to a decline in the overall species.</p> <p>G and H. Not Likely. The Project Area is not within a high-risk or moderate risk) <i>Phytophthora</i> area (DIT 2021). Management measures include weed controls during and post construction as well as vehicle hygiene practices, so establishment of new weed species or diseases in the Project Area or along access routes is not considered likely. Tracks exist throughout the Project Area</p>

Species, or Community	EPBC Act ¹	NPW Act ²	Likelihood of Occurrence	Potential Impacts	Mitigations Measures	Significant Impact Assessment (impacts following project mitigation measures)
						<p>within pastoral stations or agricultural land, so the proposal is not expected to result in an increase in abundance of feral predator species. The Action is therefore not expected to result in the introduction of invasive species or disease which are harmful to this species' habitat.</p> <p>I. Not Likely. There is no recovery plan in place for this species. There are no adopted recovery plans or threat abatement plans nominated for this species. The proposed Project will not interfere with the recovery of the species.</p>
Ruddy Turnstone (<i>Arenaria interpres</i>)	VU, MW	-	<p>PMST output suggests species or species habitat known to occur within PSL Area (Appendix A). <u>Newly listed as threatened species (Jan 2024)</u></p> <p>Breeds in Siberia and Alaska. When in Australia prefers rocky coastlines, coral and sand islands (Geering et al. 2008). The species is also strongly associated with beaches that have large expanses of rotting seaweed and will roost nearby in a range of habitats including low saltmarsh (DCCEEW 2024c). In southern Australia they prefer rockier coastlines and occur in fewer numbers on extensive mudflats (DCCEEW 2024c).</p> <p>Range includes coastline of Australia except Great Australian Bight (Davies et al. 2022).</p> <p>One previous record within PSL Area (1998) at Port Bonython, (BDBSA 2023). Historical and recent (2021) records at adjacent salt pans (ALA 2023).</p> <p>Critical habitat includes areas for breeding (outside of Australia), foraging, roosting or dispersal. Important habitat includes those listed in the National Directory of Important Migratory Shorebird Habitat (Weller et al. 2020) (DCCEEW 2024c). Whilst the Whyalla Saltfields are listed in the directory of known shorebird presence, they are not considered 'important' and not for Ruddy Turnstone (Weller et al. 2020).</p> <p>This species is unlikely to occur in the Project Area or PSL Area, given intertidal mudflats and saltmarsh areas are avoided, but has the potential to occur adjacent the Project Area and PLS Area along the nearest beach 350m south of Port Bonython Road or roosting in samphire/saltmarsh.</p>	<p>Injury or mortality from collisions with construction vehicles if low lying water attracts species to the Project Area via Whyalla Saltfields / False Bay beaches.</p> <p>Introduction of invasive weed species into non-core habitat or disease.</p> <p>Temporary disturbance associated with proximity to construction noise to nearby False Bay beaches / Whyalla Saltfields.</p>	Refer Table 3.1, measures 1, 2, 3, 4, and 5.	<p>No significant impacts expected.</p> <p>A. Not Likely. Species is unlikely to occur in the Project Area and Disturbance Footprint, species may occur in adjacent Whyalla Saltfields, samphire vegetation or False Bay Beaches. An important population is not known for the PSL Area (Weller et al. 2020, DCCEEW 2024c). Suitable non-core habitat will be avoided. With only occasional and low numbers of this species in the broader region, and with the proposed mitigation measures to further reduce potential mortality or influence on non-core habitat, this project is unlikely to lead to a long-term decrease in the size of an important population.</p> <p>B. Not Likely. The area of occupancy of this species is widespread around coastlines of Australia (and globally), with breeding occurring in the northern hemisphere (Menkhorst et al. 2017). As above, there is no suitable habitat within the Project Area that will be impacted, (with the exception of potential temporary construction noise impacts to adjacent habitats). No important population is known to occur in or adjacent the Project Area (DCCEEW 2024c), the Project is therefore unlikely to reduce the area of occupancy of an important population of this species.</p> <p>C. Not Likely. This species is part of a global population that does not breed in Australia. When in Australia the population distribution spans coastal areas. The Project avoids the nearby saltmarsh areas and saltpans adjacent the Project Area, and no important population is known for the area, therefore the Project is unlikely to fragment an existing population into two or more populations.</p> <p>D. Not Likely. Habitat critical to the survival of the species includes breeding areas outside of Australia and core foraging areas such as intertidal mudflats, with extensive seagrass wrack. Given there is no breeding habitat, and no habitat critical to the survival of the species within the Project Area, habitat that is critical to the survival of this species will not be adversely affected.</p> <p>E. Not Likely. Given the species does not breed in Australia (DCCEEW 2024c), and the Project Area is not considered to be an important stopover site, the breeding cycle of the population will not be impacted by the Project.</p> <p>F. Not Likely. Suitable habitat does not occur within the Project Area, only adjacent in samphire / Whyalla Saltfields, False Bay Beaches >350 m to 1 km from the disturbance area. Therefore, core habitat important to the survival of the species is unlikely to be modified, destroyed or removed to the extent that the species will decline.</p>

Species, or Community	EPBC Act ¹	NPW Act ²	Likelihood of Occurrence	Potential Impacts	Mitigations Measures	Significant Impact Assessment (impacts following project mitigation measures)
						<p>G. and H: Not Likely. Core habitat does not occur in the Project Area. As such, any introduction of weeds is unlikely to establish and degrade preferred habitat. The Project Area is not in a high-risk <i>Phytophthora</i> area and there will be management measures such as weed controls / vehicle hygiene practices during and post construction. Therefore, establishment of new weed species or diseases in the Project Area is unlikely. Tracks exist within the Project Area, hence an increase in abundance of feral predator species not expected. The Action is therefore not expected to result in the introduction of invasive species or disease which are harmful to the species' habitat or cause the species to decline.</p> <p>I. Not Likely. There is no specific recovery plan for this species, conservation advice is sufficient. Conservation Actions relate to minimising loss of critical habitat. Key breeding and foraging grounds do not occur within the Project Area, therefore, with mitigation measures, the proposed Action is unlikely to interfere with recovery of the species.</p>
Sharp-tailed Sandpiper (<i>Calidris acuminata</i>)	VU, MW	-	<p>PMST output suggests species or species habitat known to occur within PSL Area (Appendix A). <u>Newly listed as threatened species (Jan 2024)</u></p> <p>Migratory shorebird occurs widespread in Australian coastal and inland areas, but prefers non-tidal fresh or brackish wetlands, damp grasslands, will also utilise farms dams, wastewater irrigation areas, tidal flats, beaches (Geering et al. 2008, Menkhorst et al. 2017, ALA 2024, DCCEEW 2024e). Breeds in Siberia, migrates to New Guinea and Australia (summer) (Geering et al. 2008, DCCEEW 2024e). One previous record (2019) at Whyalla salt pans, 7 records with low spatial reliability (BDBSA 2023). Several recent (2006, 2021) and historical records at Whyalla Salt pans (ALA 2023).</p> <p>Critical habitat includes areas for breeding (outside of Australia), foraging, roosting or dispersal. Important habitat includes those listed in the National Directory of Important Migratory Shorebird Habitat (Weller et al. 2020) (DCCEEW 2024e). The Whyalla Saltfields are listed in the directory as a known shorebird area, and include a population of Sharp-tailed Sandpiper (max 146, two surveys) (Weller et al. 2020). It is considered a nationally important site if >85 individuals <u>regularly</u> occur (DCCEEW 2024e). However, Weller et al. (2020) indicate that the Whyalla Saltfields do not currently meet the criteria for a nationally important Sharp-tailed Sandpiper, but is being monitored.</p> <p>Regardless, this species is unlikely to occur in the Project Area, given intertidal mudflats and saltmarsh areas are avoided, but known to occur adjacent the PSL Area along the nearest beach 350m south of Port Bonython Road or in samphire/saltmarsh areas if holding water (e.g. in claypans following rainfall).</p>	<p>Injury or mortality from collisions with construction vehicles if low lying water attracts species to the Project Area via Whyalla Saltfields / False Bay beaches.</p> <p>Introduction of invasive weed species into non-core habitat or disease.</p> <p>Temporary disturbance associated with proximity to construction noise to nearby False Bay beaches / Whyalla Saltfields (known foraging / roosting habitat).</p>	Refer Table 3.1, measures 1, 2, 3, 4, and 5.	<p>No significant impacts expected.</p> <p>A. Not Likely. Species is unlikely to occur in the Project Area and Disturbance Footprint, species known occur in adjacent Whyalla Saltfields, samphire vegetation or False Bay beaches. An important population is not known for the PSL Area, but a population that is being monitored is known for the Whyalla Saltfields (Weller et al. 2020, DCCEEW 2024e). Suitable non-core habitat will be avoided. Regular data for this species is still being collected, but with the proposed mitigation measures to further reduce potential mortality or influence on non-core habitat, this project is unlikely to lead to a long-term decrease in the size of an important population.</p> <p>B. Not Likely. The area of occupancy of this species is widespread around coastlines of Australia (and globally), with breeding occurring in the northern hemisphere (Menkhorst et al. 2017). As above, there is no suitable habitat within the PSL Area that will be impacted, (except for potential temporary construction noise impacts to adjacent habitats). No important population occurs within the Project Area, a but a known very small population has been recorded visiting the nearby Whyalla Saltfields and is being monitored (DCCEEW 2024e). Given the Saltfields will be avoided, the Project is unlikely to reduce the area of occupancy of an important population of this species.</p> <p>C. Not Likely. This species is part of a global population that does not breed in Australia. When in Australia the population distribution spans coastal areas. The Project avoids the nearby saltmarsh areas and Whyalla Saltfields adjacent the PSL Area, therefore the Project is unlikely to fragment an existing population into two or more populations.</p> <p>D. Not Likely. Habitat critical to the survival of the species includes breeding areas outside of Australia and core foraging, roosting areas. Given there is no breeding habitat, and no habitat critical to the survival of the species within the Project Area, and known habitat nearby (Whyalla Saltfields) will be avoided, it is unlikely that habitat critical to the survival of this species will be adversely affected.</p>

Species, or Community	EPBC Act ¹	NPW Act ²	Likelihood of Occurrence	Potential Impacts	Mitigations Measures	Significant Impact Assessment (impacts following project mitigation measures)
						<p>E. Not Likely. Given the species does not breed in Australia (DCCEEW 2024e), and the Project Area is not considered to be an important stopover site, the breeding cycle of the population will not be impacted by the Project.</p> <p>F. Not Likely. Suitable habitat does not occur within the Project Area, only adjacent in samphire / Whyalla Saltfields, False Bay beaches >350 m to 1 km from the disturbance area. Therefore, core habitat important to the survival of the species is unlikely to be modified, destroyed or removed to the extent that the species will decline.</p> <p>G. and H: Not Likely. Core habitat does not occur in the Project Area. As such, any introduction of weeds is unlikely to establish and degrade preferred habitat. The Project Area is not in a high-risk <i>Phytophthora</i> area and there will be management measures such as weed controls / vehicle hygiene practices during and post construction. Therefore, establishment of new weed species or diseases in the Project Area is unlikely. Tracks exist within the Project Area, hence an increase in abundance of feral predator species not expected. The Action is therefore not expected to result in the introduction of invasive species or disease which are harmful to the species' habitat or cause the species to decline.</p> <p>I. Not Likely. There is no specific recovery plan for this species, conservation advice is sufficient. Conservation Actions relate to minimising loss of critical habitat. Key breeding and foraging grounds do not occur within the Project Area, therefore, with mitigation measures, the proposed Action is unlikely to interfere with recovery of the species.</p>
Red Knot (<i>Calidris canutus</i>)	VU, MW	-	<p>PMST output suggests species or species habitat known to occur within PSL Area (Appendix A).</p> <p><u>Recent listing change from Endangered to Vulnerable (Jan 2024).</u></p> <p><u>DCCEEW 2024d.</u></p> <p>A global migratory wader species, comprised of six subspecies, of which two visit northern and eastern Australia/New Zealand (<i>C. c. rogersi</i>) or northwest Australia (<i>C. c. piersmai</i>) (DCCEW 2024d).</p> <p>Widespread around all coastal areas of Australia, more commonly in the northern and eastern parts of Australia, e.g. strongholds on Eighty Mile Beach and Roebuck Bay (Menkhorst et al. 2017, DCCEEW 2024d)). They do not breed in Australia (breed in Siberian Islands / Russia). When in South Australia (Sept –April) occurs on extensive intertidal mud flats, with some inland records to November in very small numbers (DCCEEW 2024d).</p> <p>No recent records within 5 km of the Project Area, 3 historical records with low spatially reliability (1983–1985, BDBSA 2023). Not recorded during winter 2023 shorebird survey (Birdlife 2023).</p> <p>Species could visit the adjacent Whyalla Saltfields / False Bay beaches, samphire shrubland areas adjacent to the west end of PSL Area, particularly in following rainfall events / when in Australia. The False Bay beaches (include 5 low energy, very wide, low gradient tidal, sand and salt flats).</p>	<p>Injury or mortality from collisions with construction vehicles if low lying water attracts species to the Project Area via Whyalla Saltfields / False Bay beaches.</p> <p>Temporary disturbance associated with proximity to construction noise to nearby False Bay beaches / Whyalla Saltfields.</p> <p>Introduction of invasive weed species into non-core habitat or disease.</p>	Refer Table 3.1, measures 1, 2, 3, 4, and 5.	<p>No significant impacts expected.</p> <p>A. Not Likely. In South Australia, this migrant species occurs mostly in The Coorong, and International Bird Sanctuary, but will occur on all coastal areas, intertidal sites (DCCEEW 2024d, ALA 2024). The Project traverses a very small area of coast environment (< 1 km, ~ 350m) from False Bay beach areas, buffered by an existing major road (Port Bonython Road), mallee and coastal vegetation). With only occasional and low numbers of this species in the broader region, and with the proposed mitigation measures to further reduce potential mortality or influence on non-core habitat, this project is unlikely to lead to a long-term decrease in the size of an important population.</p> <p>B. Not Likely. The area of occupancy of this species is widespread around coastlines of Australia (and globally), with breeding occurring in the northern hemisphere (Menkhorst et al. 2017, DCCEEW 2024d). There are few historical records in the Whyalla Saltfields, adjacent the PSL area. Given no foraging or roosting habitat occurs within the Project Area or Disturbance Area, the Project is unlikely to reduce the area of occupancy of this species.</p> <p>C. Not Likely. This species is part of a global population that does not breed in Australia. When in Australia the population distribution spans coastal areas. The Project avoids foraging and roosting habitat in the beaches and saltfields adjacent the Project Area, and is unlikely to fragment an existing population into two or more populations.</p>

Species, or Community	EPBC Act ¹	NPW Act ²	Likelihood of Occurrence	Potential Impacts	Mitigations Measures	Significant Impact Assessment (impacts following project mitigation measures)
			<p>Critical habitat includes areas for breeding (outside of Australia), foraging, roosting or dispersal. Important habitat includes those listed in the National Directory of Important Migratory Shorebird Habitat (Weller et al. 2020) (DCCEEW 2024d).</p> <p>Critical habitat primarily includes a mosaic of feeding and roosting habitat; feeding habitats such as intertidal flats and beaches, but also upper tidal flats and roosting also occurs on large tidal flats, spits and banks (DCCEEW 2024d).</p> <p>Whilst not listed as important (Weller et al. 2020), the species could visit the adjacent Whyalla Saltfields / False Bay beaches, when in Aus. The False Bay beaches (include 5 low energy, very wide, low gradient tidal, sand and salt flats) likely provide suitable habitat.</p> <p>This species is unlikely to occur in the Project Area or PSL Area, given intertidal mudflats and saltmarsh areas are avoided, but potential to occur adjacent the PSL area with the nearest beach 350 m south of Port Bonython Road.</p>			<p>D. Not Likely. Habitat critical to the survival of the species includes breeding areas outside of Australia and core foraging and roosting areas such as intertidal mudflats. Given there is no breeding habitat, and potential foraging and roosting habitat is avoided, habitat that is critical to the survival of this species will not be adversely affected.</p> <p>E. Not Likely. Given the species does not breed in Australia (DCCEEW 2024d), the breeding cycle of the population will not be impacted by the Project.</p> <p>F. Not Likely. There is minimal potential foraging habitat present within or adjacent the Project Area, and the main coastal interaction is 350 m south of Port Bonython Road or rarely in the artificial saltfields which are outside the Project Area. Therefore, core habitat important to the survival of the species is unlikely to be modified, destroyed or removed to the extent that the species will decline.</p> <p>G and H: Not Likely. Core habitat does not occur in the Project Area. As such, any introduction of weeds is not considered likely to result in establishment and degradation of preferred habitat. The Project Area is not in a high-risk <i>Phytophthora</i> area. Management measures include weed controls during and post construction as well as vehicle hygiene practices, so establishment of new weed species or diseases in the Project Area is not considered likely. Tracks exist within the Project Area, so the proposal is not expected to result in an increase in abundance of feral predator species. The Action is therefore not expected to result in the introduction of invasive species or disease which are harmful to this species' habitat.</p> <p>I. Not Likely. There is no specific recovery plan for this species, but new conservation advice is considered sufficient (DCCEEW 2024d). Conservation Actions relate to loss of key habitat and disturbance at feeding and roosting sites, with off-leash dogs a key threat. Whilst non-core / widely distributed foraging and roosting grounds occur south to south east of the Project Area, with mitigation measures, the proposed Action is unlikely to interfere with recovery of the species.</p>
Curlew Sandpiper (<i>Calidris ferruginea</i>)	CE, MW	E	<p>PMST output suggests species or species habitat known to occur within PSL Area (Appendix A).</p> <p>Migratory species breeds in the high arctic tundra. When in Australia prefers exposed intertidal mudflats and less frequently inland freshwater / brackish wetlands (Geering et al. 2008, Menkhorst et al. 2017, DCCEEW 2023g). Juveniles remain in Aus for first Austral Winter (2 years old) (Menkhorst et al. 2017).</p> <p>The EOO is estimated at 10,900,000 km², and the AOO estimated at 8,000 km² and no critical habitats are listed in the Register of Critical Habitat (DCCEEW 2023g). However, habitat that is considered critical during the non-breeding season includes a mosaic of feeding and roosting habitats, in particular exposed sandy / soft muddy substrates on intertidal flats (DCCEEW 2023g).</p>	<p>Injury or mortality from collisions with construction vehicles if low lying water attracts species to the Project Area via Whyalla Saltfields / False Bay beaches.</p> <p>Temporary disturbance associated with proximity to construction noise to nearby False Bay beaches / Whyalla Saltfields.</p> <p>Introduction of invasive weed species into non-core habitat or disease.</p>	Refer Table 3.1, measures 1, 2, 3, 4, and 5.	<p>No significant impacts expected.</p> <p>A. Not Likely. Key sites for migratory shorebirds within the East Asian-Australasian Flyway (EAAF) are listed by DoE (2018) and the Project Area does not intersect any of these sites. Only occasional and very low numbers of historic records of the species recorded in proximity of the Project Area in the Whyalla Saltfields. It is considered that the Project Area itself does not support any notable populations of the species. With minimisation of disturbance footprints and specific measures taken to avoid notable coastal environments. The Project is not expected to result in a long-term decrease in the size of the EAAF or Australian populations (of over 90,000 or 40,100 respectively, DCCEEW 2023g).</p> <p>B. Not Likely. The area of occupancy is widespread within Australia (and globally) for this migratory species which breeds outside of Australia (Menkhorst et al. 2017). Given no specific preferred habitat occurs within the Project Area, and potential</p>

Species, or Community	EPBC Act ¹	NPW Act ²	Likelihood of Occurrence	Potential Impacts	Mitigations Measures	Significant Impact Assessment (impacts following project mitigation measures)
			<p>Several historical and recent BDBSA records (2, most recent from 2019) within 5 km of the Project Area in Whyalla Saltfields / saltworks (BDBSA 2023). These areas (previously called 'BHP Saltfields' are not listed as nationally or internationally important to the Curlew Sandpiper (Weller et al. 2020).</p> <p>Possible occurrence when in Australia, following rainfall events / where there is water present in the areas around the salt pans with muddy edges, that are adjacent the Project Area.</p> <p>The species may visit the adjacent evaporation ponds in False Bay, samphire shrubland areas in the centre / west end of PSL Area, particularly in following rainfall events / when in Aus.</p> <p>This species is considered to have the potential to occur adjacent the Project Area or the PSL Area.</p>			<p>foraging habitats can either be easily avoided or impact to these habitats therefore minimised, the area of occupancy for this species is unlikely to be notably reduced.</p> <p>C. Not Likely. Given the species population has global representation and there is no breeding habitat, minimal preferred habitat, and no habitat critical to the survival of the species in the Project Area, the Project Area is unlikely to represent important habitat for the species. Hence, the Project is unlikely to fragment an existing population of the species.</p> <p>D. Not Likely. Given there is no breeding habitat, minimal preferred habitat, and no habitat critical to the survival of the species within the Project Area, habitat that is critical to the survival of this species will not be adversely affected.</p> <p>E. Not Likely. Given the species does not breed in Australia (i.e. breeds in the Arctic Tundra of Siberia (Geerling et al. 2008), the breeding cycle of the population will not be impacted.</p> <p>F. Not Likely. There is no preferred habitat (i.e. coastal bays, inland salt lakes, Geering et al. 2008) that will be impacted within the Project Area. The Project avoids potential foraging habitat; the Whyalla Saltfields are adjacent the Project Area (<1 km to 4 km from the Disturbance Footprint) and False Bay beaches are > 350 m from the Disturbance Footprint, buffered by coastal vegetation, mallee and Port Bonython Road. These areas are not highlighted as specifically critical in the Shorebird register (Weller et al. 2020). Therefore, quality habitat important to the survival of the species is unlikely to be modified, destroyed or removed to the extent that the species will decline.</p> <p>G and H. Not Likely. No critical habitat occurs in the Project Area. As such, any introduction of weeds is not considered likely to result in establishment and degradation of preferred habitat. The Project Area is not in a high-risk <i>Phytophthora</i> area. Management measures include weed controls during and post construction as well as vehicle hygiene practices, so establishment of new weed species or diseases in the Project Area is not considered likely. Tracks exist within the Project Area, so the proposal is not expected to result in an increase in abundance of feral predator species. The Action is therefore not expected to result in the introduction of invasive species or disease which are harmful to this threatened species.</p> <p>I. Not Likely. There is no specific recovery plan for this species. Conservation Actions relate to loss of key habitat within the East China Sea. Australian conservation Actions relate to reducing impacts from human disturbance, habitat loss, and invasive plants at key feeding grounds. Key feeding grounds do not occur within the Project Area, therefore, with mitigation measures, the proposed Action is unlikely to interfere with the recovery of the species.</p>
Great Knot (<i>Calidris tenuirostris</i>)	VU, MW	E	<p>PMST output suggests species or species habitat known to occur within PSL area (Appendix A).</p> <p><u>Recent listing change from Critically Endangered to Vulnerable (Jan5 2024).</u></p> <p>Migratory shorebird that does not breed in Australia. Prefers sheltered coastal habitats, with large intertidal mudflats or</p>	<p>Temporary disturbance associated with proximity to construction noise to nearby False Bay beaches / Whyalla Saltfields.</p> <p>Injury or mortality from collisions with construction vehicles if low lying water</p>	Refer Table 3.1, measures 1, 2, 3, 4, and 5.	<p>No significant impacts expected.</p> <p>A. Not Likely. Non-breeding visitor to Australia, with strongholds in north-western Australia and the Northern Territory, being far less common in South Australia (DCCEEW 2024f). Whilst the species may visit the Whyalla Saltfields /False Bay beaches in proximity to the Project Area, an important population is not</p>

Species, or Community	EPBC Act ¹	NPW Act ²	Likelihood of Occurrence	Potential Impacts	Mitigations Measures	Significant Impact Assessment (impacts following project mitigation measures)
			<p>sandflats, including natural environments along and close to the coast, and artificial environments such as ponds in saltworks/saltfields (Geering et al. 2008; Menkhorst et al. 2017). In SA strongholds are western Eyre Peninsula, ‘Adelaide International Bird Sanctuary’ and Coorong.</p> <p>No recent records within 5 km of the PSL Area (BDBSA 2023), few historical records near Whyalla Saltfields (ALA 2024).</p> <p>Critical habitat includes areas for breeding (outside of Australia), foraging, roosting or dispersal. Important habitat includes those listed in the National Directory of Important Migratory Shorebird Habitat (Weller et al. 2020) (DCCEEW 2024f). Feeding and roosting habitats are associated with large intertidal mud and sandflats (DCCEEW 2024f).</p> <p>The species could visit the adjacent Whyalla Saltfields and beaches in False Bay, south southeast of the PSL/Project Area when in Aus.</p> <p>This species is unlikely to occur in the Project Area, but has a low potential to occur in beach habitats adjacent the Project Area and PSL Area.</p>	<p>attracts species to the Project Area via Whyalla Saltfields / False Bay beaches.</p> <p>Introduction of invasive weed species into non-core habitat or disease.</p>		<p>known to occur at the Whyalla Saltfields/False Bay beaches (DAW 2020). With only occasional and low numbers of this species in the broader region, and with the proposed avoidance of coastal foraging/roosting habitat, this Project is unlikely to lead to a long-term decrease in the size of an important population.</p> <p>B. Not Likely. The area of occupancy of this species is widespread within Australia (and globally), with breeding occurring in the northern hemisphere (DCCEEW 2024f). Given no foraging or roosting habitat occurs within the Project Area, the Project is unlikely to reduce the area of occupancy of this species.</p> <p>C. Not Likely. This migratory species is part of a global population. There is no breeding habitat and no potential foraging habitat within the Project Area. No important population is known from the Project Area or nearby (DAW 2020), therefore this project is unlikely to fragment an existing important population into two or more populations.</p> <p>D. Not Likely. The area of occupancy is widespread along coastlines of Australia for this migratory species, which breeds outside of Australia (DCCEEW 2024f). There is no breeding habitat, no foraging/roosting habitat in the Disturbance Footprint, hence no habitat critical to the survival of the species within the Project Area. Therefore, habitat that is critical to the survival of this species will not be adversely affected.</p> <p>E. Not Likely. Given the species does not breed in Australia (DCCEEW 2024f), the breeding cycle of the population will not be impacted.</p> <p>F. Not Likely. There is foraging/roosting habitat present within the Project Area. There are few recent reliable records of this species in or adjacent coastal areas abutting the Project Area (BDBSA 2023). Therefore, quality habitat important to the survival of the species is unlikely to be modified, destroyed or removed to the extent that the species will decline.</p> <p>G and H: Not Likely. The distribution of Great Knot is largely concentrated outside of SA, with no recent reliable records from areas adjacent the Project (BDBSA 2023, ALA 2024). Suitable foraging and roost habitat occurs adjacent the Project Area, but will be avoided for ecological, cultural and constructability purposes, as such, any introduction of weeds is not considered likely to result in establishment and degradation of preferred habitat. The Project Area not in a high-risk <i>Phytophthora</i> area. Management measures such as weed controls, vehicle hygiene practices, use of existing tracks and waste management are not expected to result in an increase in abundance of weeds and feral predator species. The Action is therefore not expected to result in the introduction of invasive species or disease which are harmful to this species’ habitat and the species would decline.</p> <p>I. Not Likely. There is no specific recovery plan for this species, conservation advice is considered sufficient (DCCEEW 2024f). Conservation Actions relate to loss of critical habitat, including future habitat predicted to be critical as a result of climate change. Key foraging/roosting do not occur within the Project Area, therefore, with mitigation measures, the proposed Action is unlikely to interfere with recovery of the species.</p>

Species, or Community	EPBC Act ¹	NPW Act ²	Likelihood of Occurrence	Potential Impacts	Mitigations Measures	Significant Impact Assessment (impacts following project mitigation measures)
Greater Sand Plover/Large Sand Plover (<i>Charadrius leschenaultii</i>)	VU, MW	R	<p>PMST output suggests species or species habitat likely to occur within PSL area (Appendix A).</p> <p>Early migratory bird that visits Australia (Aug-March) and remains in Aus for first austral winter. Occurs in tidal flats and roosts on beaches at high tide (Menkhorst et al. 2017, Geering et al. 2008).</p> <p>No recent records within 5 km of the Project Area, 2 historical (1983-1984) with low spatial reliability within 5km of PSL Area (BDBSA 2023).</p> <p>Species may visit the adjacent Whyalla Saltfields/beaches in False Bay, samphire shrubland areas in the centre / west end of PSL Area, particularly in following rainfall events / when in Australia.</p> <p>This species is unlikely to occur in the Project Area or PSL Area, but has low potential to occur in the adjacent saltfields/beaches.</p>	<p>Temporary disturbance associated with proximity to construction noise to nearby False Bay beaches / Whyalla Saltfields.</p> <p>Injury or mortality from collisions with construction vehicles if low lying water attracts species to the Project Area via Whyalla Saltfields / False Bay beaches.</p> <p>Introduction of invasive weed species into non-core habitat or disease.</p>	Refer Table 3.1, measures 1, 2, 3, 4, and 5.	<p>No significant impacts expected.</p> <p>A. Not Likely. As a non-breeding visitor to Australia, critical breeding areas are not within the Project Area. Strongholds for this species outside of breeding season are in primarily northern Australia, although widespread and has been recorded from the Spencer Gulf and EP (DCCEEW 2023a). With only occasional and low numbers of this species in the broader region, it is unlikely that the Project Area contains any critical foraging habitat for an important population. General avoidance of coastal and intertidal environments will limit potential impacts to foraging habitat. This project is unlikely to lead to a long-term decrease in the size of an important population.</p> <p>B. Not Likely. The area of occupancy of this species is widespread within Australia (and globally), with breeding occurring in the northern hemisphere (DCCEEW 2023a). With only occasional and low numbers of this species in the broader region, it is unlikely that the Project Area contains an important population of this species. Avoidance of coastal and intertidal environments by the Project means that the Project is unlikely to reduce the area of occupancy of an important population.</p> <p>C. Not Likely. This species is a non-breeding visitor to Australia, and with only occasional and low numbers of this species in the broader region, the Project Area is unlikely to contain and important population of this species (DCCEEW 2023a, BDBSA 2023). Together with being highly mobile, it is unlikely that this project will fragment an existing important population into two or more populations.</p> <p>D. Not Likely. The area of occupancy is widespread within Australia for this migratory species, which breeds outside of Australia (DCCEEW 2023a). Given there is no breeding habitat, minimal potential foraging habitat, and no habitat critical to the survival of the species within the Project Area (with breeding occurring offshore), habitat that is critical to the survival of this species will not be adversely affected.</p> <p>E. Not Likely. Given the species does not breed in Australia (DCCEEW 2023a), the breeding cycle of the population will not be impacted.</p> <p>F. Not Likely. There is minimal potential foraging habitat present within the Project Area. There are only very few recent reliable records of this species within adjacent coastal areas in proximity to the Project Area (BDBSA 2023). Therefore, quality habitat important to the survival of the species is unlikely to be modified, destroyed or removed to the extent that the species will decline.</p> <p>G and H: Not Likely. Species has low potential to occur in the Project Area and breeding occurs in the northern hemisphere. Core foraging habitat does not occur in the Project Area. As such, any introduction of weeds is not considered likely to result in establishment and degradation of preferred habitat. The Project Area is not in a high-risk <i>Phytophthora</i> area. Management measures such as weed controls, vehicle hygiene practices, use of existing tracks and waste management are not expected to result in an increase in abundance of weeds and feral predator species. The Action is therefore not expected to result in the introduction</p>

Species, or Community	EPBC Act ¹	NPW Act ²	Likelihood of Occurrence	Potential Impacts	Mitigations Measures	Significant Impact Assessment (impacts following project mitigation measures)
						of invasive species or disease which may cause this species to decline. I. Not Likely. There is no specific recovery plan for this species as the conservation advice is sufficient (DCEEW 2023a). Conservation Actions relate to preventing loss of key habitat for breeding, migration and foraging. Core breeding and foraging grounds do not occur within the Project Area, therefore, with mitigation measures, the proposed Action is unlikely to interfere with recovery of the species.
Grey Falcon (<i>Falco hypoleucos</i>)	VU	R	<p>PMST suggests known in PSL Area (Appendix A). Rarely encountered. Preferred habitat includes open plains and treed watercourses in arid inland areas. When not actively hunting roosts in shady trees or communications towers (Menkhorst et al. 2017).</p> <p>Whilst the species has a widespread distribution across Australia (ALA 2024), the Project Area occurs in the species occasional range (Davies et al. 2022). No large treed-watercourses are present within the Project Area, but the species may forage widely, generally across open plains, if present and feeds exclusively on other birds (Menkhorst et al. 2017). Conservatively, if present the species may use open areas for foraging and treed areas for roosting, with > 6000 ha available general habitat in the PSL Area.</p> <p>One record within 5 km (2011, no spatial reliability, BDBSA 2023. Not detected in the PSL Area or 5 km buffer to date. Possible as an occasional overfly visitor. No suitable nesting habitat present in Project Area.</p> <p>This species has potential to occur in the Project Area and PSL Area.</p>	<p>Loss of potential general foraging habitat, and or temporary roosting habitat.</p> <p>Injury or mortality from collisions with vehicles traversing access track or risk is significantly lower (for this species) due to sparse occurrence.</p> <p>Introduction of invasive weed species or disease.</p>	Refer Table 3.1, measures 1, 2, 3, 4, and 5.	<p>No significant impacts expected.</p> <p>A. Not Likely. The Grey Falcon occurs in low densities across much of arid and semi-arid Australia. As a habitat generalist, there is little known about important populations with the exception of their preference to nest in tall trees adjacent watercourses where whilst breeding, they feed almost exclusively on other birds (TSSC 2020). Surveys to date note an absence of large, treed watercourses in the Project Area (Jacobs 2023a, Lathwida 2024b) and hence the Project Area is unlikely to support an important population of this species. Any disturbance as a result of the Project represents a loss of general foraging habitat only, representing a very small fraction of total available habitat for this species (e.g. .at most 2.5% of the PSL Area for temporary clearance and 0.001% permanent loss). The Project is unlikely to result in a long-term decrease in the size of an important population of a species.</p> <p>B. Not Likely. The Project Area is unlikely to support an important population of this species, with an absence of larger tree lined watercourses surrounded by low-land timbered plains (Jacobs 2023a, 2023b, EBS 2023, Infrastructure SA 2024, Lathwida 2024). The minimum AOO for the species is 8,8000,000 ha (Garnet and Baker 2021). The total temporary clearance for the project (102 ha) represents 0.0001% of the species AOO. Given the limited presence of preferred habitat, lack of important population and measures to limit clearance of general foraging habitat required for pipeline construction, wherever possible, the Action is unlikely to lead to a significant reduction in the area of occupation of an important population of this species.</p> <p>C. Not Likely. As above, the Project Area is unlikely to support an important population of this species which could be fragmented into two or more populations. The project will require clearance for access tracks (where existing tracks are not already present) and temporary clearance for the underground storage pipeline followed by rehabilitation, which are unlikely to inhibit movement nor restrict gene flow of this highly mobile, aerial species across the landscape. Therefore, the Action is considered unlikely to cause fragmentation of any population, with no important population documented for the Project Area or identifiable from species records.</p> <p>D. Not Likely. The Grey Falcon is a habitat generalist that occurs in low densities across much of arid and semiarid Australia. Surveys to date note an absence of preferred large, treed watercourses in the Project Area used for hunting and breeding (Jacobs 2023a, 2024b, EBS 2023, Infrastructure SA 2024, Lathwida</p>

Species, or Community	EPBC Act ¹	NPW Act ²	Likelihood of Occurrence	Potential Impacts	Mitigations Measures	Significant Impact Assessment (impacts following project mitigation measures)
						<p>2024b), and hence the Project Area is unlikely to support habitat that is critical to the survival of this species.</p> <p>E. Not Likely. The Project Area is unlikely to support an important population of this species. Minimal clearance of potential general habitat will occur and with the implementation of proposed mitigation measures, and once constructed, the Action is unlikely to prevent movement across the landscape. Therefore, interruption to the species breeding cycle (preferred breeding habitat noted as unlikely to occur in the Project Area) is not expected.</p> <p>F. Not Likely. The Action will result in regionally insignificant clearance of likely general habitat, with an absence of large, treed watercourses which are preferred by this species. Together with minimisation and micro-alignment of project footprints wherever possible, the Action is unlikely to significantly impact on habitat extent and quality which would lead to a decline in the species population.</p> <p>G. and H: Not Likely. It is considered unlikely that a significant population of Grey Falcon exists in the Project Area and preferred habitat is limited or not present. As such, any introduction of weeds and pests is not considered likely to result in establishment and degradation of preferred habitat. The Project Area is not in a high-risk Phytophthora area. Management measures include weed controls during and post construction as well as vehicle hygiene practices, hence establishment of new weed species or diseases in the Project Area is not considered likely. The Action is therefore not expected to result in the introduction of invasive species or disease which are harmful to this threatened species or the species habitat.</p> <p>I. Not Likely. It is noted that a recovery plan is not required for this species (TSSC 2020). Recovery Actions for this species are likely to include better understanding of locations and distributions of important populations and critical habitat. The proposed Actions will not interfere with the recovery of the species.</p>
Latham’s Snipe / Japanese Snipe (<i>Gallinago hardwickii</i>)	VU, MW	R	<p>PMST suggests may occur in PSL Area (Appendix A). <u>Recent listing as threatened (5 Jan 2023)</u>.</p> <p>Latham’s Snipe breeds in Japan and Russia and migrates to south-eastern Australia via New Guinea and northern Australia (DCCEEW 2024g). In SA range includes southeast, Adelaide Plains, MLR and the lower EP (DCCEEW 2024g, ALA 2024).</p> <p>They prefer tussock grass and low dense sedges surrounding freshwater wetland, permanent and ephemeral wetlands. Can also occur in habitats with saline or brackish water in modified or artificial wetlands.</p> <p>The PSL Area is generally outside the known core range in Australia, in SA range includes South East, not EP (Menkhorst et al. 2017, Davies et al. 2022).</p> <p>No records within 5 km, no suitable habitat within or adjacent the Project Area or the PSL Area.</p>	Unlikely to occur, N/A	None required.	<p>No Significant Impacts Expected.</p> <p>Criteria A, B, C, D, E, F, G, H and I not likely to be triggered as species is considered unlikely to occur in the Project Area.</p>

Species, or Community	EPBC Act ¹	NPW Act ²	Likelihood of Occurrence	Potential Impacts	Mitigations Measures	Significant Impact Assessment (impacts following project mitigation measures)
			<p>Critical habitat includes areas for breeding (outside of Australia), foraging, roosting or dispersal. Important habitat includes those listed in the National Directory of Important Migratory Shorebird Habitat (Weller et al. 2020) (DCCEEW 2024g). Critical feeding and roosting habitats are associated with freshwater wetlands with dense low vegetation (DCCEEW 2024g).</p> <p>No important populations known for the Study Area (Weller et al. 2020).</p> <p>Given lack of suitable habitat and records the species is considered unlikely to occur in the Project Area or PSL Area or adjacent areas.</p>			
Painted Honeyeater (<i>Grantiella picta</i>)	VU	R	<p>PMST suggests may occur in PSL Area (Appendix A). Endemic to mainland Australia, primarily occurring in Queensland, New South Wales and Victoria, occasionally in the Northern Territory and may be a vagrant to South Australia</p> <p>Occurs in dry open forests and woodlands (prefers Acacia woodland / <i>Allocasuarina</i> woodland) and is strongly associated with mistletoe. May also be found along rivers, on plains with scattered trees and on farmland with remnant vegetation. Rare throughout its range (Menkhorst et al. 2017, DotE 2015a).</p> <p>Project Area occurs outside of species known range.</p> <p>No previous records within 5 km of the PSL Area (BDBSA 2023).</p> <p>This species is considered unlikely to occur in the Project Area or the PSL Area.</p>	Unlikely to occur, N/A	None required.	<p>No Significant Impacts Expected.</p> <p>Criteria A, B, C, D, E, F, G, H and I not likely to be triggered as species is considered unlikely to occur in the Project Area.</p>
Malleefowl (<i>Leipoa ocellata</i>)	VU	V	<p>PMST output suggests species or species habitat known to occur within PSL Area (Appendix A).</p> <p>A large ground-dwelling bird found mostly in mallee-dominated shrublands and low woodlands in the southern half of Australia (DCCEEW 2024j). Within South Australia, the majority of records of the species are from the EP and Murray Darling Basin region. Critical habitat is semi-arid to arid shrublands and low woodlands (especially those dominated by mallee and/or Acacias). Sandy soils and abundance leaf litter are required for breeding (Benshemesh 2007). Densities of birds are greatest in areas of higher rainfall and on more fertile soils where shrub diversity is greatest (Benshemesh 2007). No specific important populations have been defined for the species, but all populations and areas occupied by Malleefowl are considered equally important for the species recovery (Benshemesh 2007, DCCEW 2024j).</p> <p>Suitable habitat occurs in large patches of intact Mallee sand dunes / swales over limestone along Port Bonython Road in land owned by the Department of Defence (DoD) and small pockets south of Port Bonython Road.</p> <p>Three previous records (2019), within the PSL Area (BDBSA 2023). All recorded crossing the road from mallee adjacent Port Bonython Road.</p>	<p>Clearance of potential habitat for pipeline and temporary access tracks.</p> <p>Increased vehicle strike along existing and temporary access tracks.</p> <p>Animals falling within open trenches during excavation for the pipeline.</p> <p>Introduction of invasive weed species resulting in habitat degradation.</p> <p>Increase feral animal predation and or competition.</p>	<p>Refer Table 3.1, measures 1, 2, 3, 4, and 5.</p> <p>Additional measures to include in the TSMP:</p> <ul style="list-style-type: none"> Implement construction constraints in 100m vicinity of active or potentially active Malleefowl nests where feasible. Routine monitoring of open trenches during construction activities to inspect for trapped fauna. Presence of, or access to, trained fauna handlers during construction to assist with removal of, and relocation of, any trapped (and/or injured) fauna displaced during habitat clearance. Progressive back filling of trenches to minimise the length of open trenches at any time during construction. 	<p>Significant impacts are considered unlikely.</p> <p>A. Not Likely. As per Benshemesh (2007), no important populations of Malleefowl have been defined for this wide ranging species that occurs across the southern half of Australia. All populations are considered of equal importance (DCCEEW 2024j). Suitable species nesting and foraging habitat occurs across inland sandy dunal areas supporting Mallee EP communities along Port Bonython Road within the Project Area. Records are widely distributed across the central and southern EP, including several records along Port Bonython Road and adjacent intact mallee vegetation, which is contiguous with a 2870 ha patch of mallee on DoD land. The total disturbance of mallee habitat represents <1% of that patch and a very small portion of available habitat regionally and across Australia (e.g. 0.001 % of AOO), the removal of habitat through disturbance may represent a potential short-term decrease in the size of the local population. Minimisation of the construction corridor width through mallee habitat, and mitigations to avoid indirect impacts to individuals as a result of the Project (e.g. weed spread, management of feral animals, speed limits) will reduce impacts as far as practicable thus limiting potential long-term impacts to the species. Any existing access tracks through the road reserve which traverses Port Bonython Road or previously disturbed areas will be utilised wherever possible. The pipeline will be buried with topsoil replaced to facilitate natural regeneration, although noting mallee will take</p>

Species, or Community	EPBC Act ¹	NPW Act ²	Likelihood of Occurrence	Potential Impacts	Mitigations Measures	Significant Impact Assessment (impacts following project mitigation measures)
			<p>The mallee areas within the PSL Area in the centre and east, may provide foraging habitat for this species (Figure 1.4). However, given the lack of deep sandy soils and the presence of limestone near the surface, the section of mallee in the Project Area is unlikely to provide optimal nesting habitat. Optimal nesting habitat is more likely to occur in the large patch (2870 ha) of mallee that occurs north of Port Bonython Road on DoD land.</p> <p>Presence of this species (individuals, mounds) has not been detected during the surveys to date (e.g. 12 person hours dedicated searching, plus 8 person hours undertaking vegetation assessments within 42 ha of potential habitat (March 2024), slow drive survey and ground-truth of LiDAR data (August 2024) as per relevant criteria (National Malleefowl Recovery Team 2020; DEWHA 2010, DCCEEW 2024j).</p> <p>For further discussion re: Area of Occupancy and Disturbance Footprint see Section 4.3.</p> <p>This species is considered to known to occur in the Project Area and PSL Area.</p>			<p>longer to recover. Regardless, while a short-term decrease in the number of Malleefowl in the local area cannot be ruled out (as a result of direct or indirect impacts), the Action is unlikely to cause a long term decrease in the size of an important population, which has not necessarily been defined for this location.</p> <p>B. Not Likely. Portions of the Project pipeline alignment (sections of Port Bonython Road) traverse Mallee vegetation on low dunes / swales over limestone which represents suitable foraging habitat for Malleefowl and potential nesting (where sands are deeper). These areas are contiguous with vast areas (2870 ha) of similar habitat on DoD managed land. These portions of the pipeline alignment have records of Malleefowl presence within a few hundred metres of the alignment in several places (crossing the road, not nesting). The Project Area also occurs between an existing pipeline and the Port Bonython Road. The species is considered known to occur in the Project Area, but the local population is not known to be considered important (Benshemesh 2007)). Route selection, footprint minimisation and other mitigations have been proposed to minimise disturbance to habitat for Malleefowl, this temporary clearance of up to 28 ha represents 1% of the localized large patch of mallee and at most 0.001% of the species Area of Occupancy for this species where an important population is not defined. Given the clearance is on the edge of a very large patch, adjacent an existing highway, with existing tracks present, it is considered unlikely that the Action will significantly impact the species by reducing the AOO of an important population.</p> <p>C. Not Likely. The proposed disturbance includes at most 28 ha of temporary clearance of foraging habitat (mallee and tall shrubland) and negligible permanent clearance of mallee adjacent existing tracks and Port Bonython Road for a buried pipeline, with installation followed by rehabilitation of the construction corridor. This is considered unlikely to restrict movement of individuals nor restrict gene flow of this species across the landscape. Therefore, whilst an important population is not defined for the Project Area, the Action is considered unlikely to cause fragmentation of the local population of the species into two or more populations.</p> <p>D. Not Likely. Suitable habitat is widespread for this species regionally on the EP and species records are spread throughout the central and southern EP. With mitigation measures proposed to minimise clearance areas where practicable, and the widespread nature of available habitat, particularly to the north of Port Bonython Road on DoD land, the Action is considered unlikely to significantly impact habitat considered critical for survival of the species.</p> <p>E. Not Likely. Malleefowl breed from spring to early summer (DCCEEW 2024j). To date no Malleefowl mounds have been detected in the Disturbance Footprint. Minimisations in the construction footprint through areas of known and potential Malleefowl habitat, rehabilitation of the majority of the disturbed area and other mitigations post construction (e.g. weed and pest control, as required) aim to limit potential impacts to quality habitat. Whilst disturbance is likely in immediate proximity to the construction corridor during construction, once the pipeline is</p>

Species, or Community	EPBC Act ¹	NPW Act ²	Likelihood of Occurrence	Potential Impacts	Mitigations Measures	Significant Impact Assessment (impacts following project mitigation measures)
						<p>buried the post-construction rehabilitated areas are unlikely to inhibit movement of individuals nor geneflow across the landscape. Therefore, the proposed Action is considered unlikely to disrupt the breeding cycle of the local population, regardless of whether it is considered an important population, which it is not.</p> <p>F. Not Likely. As above, minimisations in the width of the construction footprint through areas of known and potential Malleefowl habitat, use of existing tracks and rehabilitation of the majority of the disturbed area through natural regeneration or active rehabilitation will limit potential impact to available habitat for Malleefowl. Mitigations such as weed management along the pipeline corridor once in the ground will reduce further impacts to quality of habitat for this species. Whilst the pipeline alignment does cross through known Malleefowl habitat adjacent Port Bonython Road the known distribution of Malleefowl is widespread across the EP, through the Great Victorian Desert, and also broadly across large parts of WA, Central NSW and western Victoria and as such, the proposed Action is not expected to result in an impact on habitat extent and quality such that it results in decline of the species.</p> <p>G and H: Not Likely. Tracks and roads already exist within and adjacent the Project Area, fragmenting the landscape, and are a source of both feral animals and weed incursions. The Project Area is not in a high-risk <i>Phytophthora</i> area. Environmental management measures (e.g. vehicle hygiene, weed control, waste management - to prevent attraction of feral animals, will limit the potential for invasive species, or the introduction of disease, or elevation of existing predation pressure on this species. The Action is therefore not expected to result in the introduction of any new invasive weed and pest species or disease which are harmful to this species or the species habitat.</p> <p>I. Not Likely. Recovery Actions for this species are ongoing and include better understanding of locations and distributions of important populations and critical habitat, and to better understand threats to current populations (Benshemesh 2007). Key threats include clearing and habitat destruction, fragmentation and isolation, mortality on roads, fire, grazing predation, weeds and impacts of climate change (DCCEEW 2024j). The proposed Action is unlikely to interfere with the recovery of the species.</p>
Nunivak Bar-tailed Godwit / Western Alaskan Bar-tailed Godwit (<i>Limosa lapponica baueri</i>)	EN	R	<p>PMST output suggests species or species habitat may occur within PSL Area (Appendix A).</p> <p><u>Recent listing status change from Vulnerable to Endangered (Jan 5 2024).</u></p> <p>Three subspecies occur is Australia in total; the other two being are <i>L. l. anadyrensis</i> and <i>L. l. menzbieri</i> (DCCEEW 2024h). All of these large migratory shorebirds do not breed in Australia, but rather Siberia and Alaska (DCCEEW 2024h). When in Australia, the sub-species mainly occurs along the north and east coasts, in SA it mainly occurs form the coast near Lake Alexandrina (Coorong) to Denial Bay (past Ceduna) (DCCEEW 2024h), hence could occur near the Project Area. They prefer edges of water or water with</p>	<p>Temporary disturbance associated with proximity to construction noise to nearby False Bay beaches / Whyalla Saltfields.</p> <p>Injury or mortality from collisions with construction vehicles if low lying water attracts species to the Project Area via Whyalla Saltfields / False Bay beaches.</p> <p>Introduction of invasive weed species into non-core habitat or disease.</p>	Refer Table 3.1, measures 1, 2, 3, 4, and 5.	<p>No significant impacts expected.</p> <p>A. Not Likely. Species is a non-breeding visitor to Australia, with strongholds outside of breeding season occurring in northern and eastern Australia (DCCEEW 2024h). There are historical records adjacent the Project Area, and limited recent records for the species within 5 km of the Project Area. The Project will avoid the adjacent coastal environment, particularly intertidal beaches, which represent potential foraging/roosting habitat for the species, when in Australia. With the additional proposed mitigation measures the Project is unlikely to lead to a long-term decrease in the size of a population.</p> <p>B. Not Likely. As above, the area of occupancy of this species is global, with breeding occurring the northern hemisphere, and with</p>

Species, or Community	EPBC Act ¹	NPW Act ²	Likelihood of Occurrence	Potential Impacts	Mitigations Measures	Significant Impact Assessment (impacts following project mitigation measures)
			<p>shallow tidal estuaries, as well as intertidal sandflats and beaches (Geering et al. 2008, DCCEEW 2024h). There are no recent or spatially reliable records within 5 km of the Project Area (BDBSA 2023), but there are five historical records (1980s) from the 'Whyalla Saltfields' / False Bay. Hence potential suitable habitat occurs adjacent the centre of the southern boundary of the PSL Area in the Whyalla Saltfields and where the alignment runs along Port Bonython road 350 m to coastal beaches at False Bay (only for < 1 km, buffered by coastal vegetation, mallee and existing road). Critical habitat includes areas for breeding (outside of Australia), foraging, roosting or dispersal. Important habitat includes those listed in the National Directory of Important Migratory Shorebird Habitat (Weller et al. 2020) (DCCEEW 2024h). Critical feeding and roosting habitats are associated with mosaic of feeding and roosting habitat, i.e. intertidal flats and beaches (DCCEEW 2024h).</p> <p>No important populations known for the wider PSL Area (Weller et al. 2020). The majority of records are from the eastern Aus, Coorong, Adelaide international bird sanctuary (ALA 2024).</p> <p>This species is considered unlikely to occur in the Project Area or PSL Area, but has potential to occur adjacent the Project Area and PSL Area at the Whyalla Saltfields / False Bay beaches.</p>			<p>non-breeding strongholds of this in northern and eastern Australia as well as New Zealand (DCCEEW 2024h). Any suitable shorebird habitat that is adjacent the Project Area will be avoided. With no potential foraging/roosting habitat occurring within the project footprint, and proposed mitigation measures to avoid indirect impacts the proposed Action is unlikely to reduce the area of occupancy of the species.</p> <p>C. Not Likely. As above, there is no known local population of this species within the Project Area (Weller et al. 2020), but individuals may occur in adjacent habitats (Whyalla Saltfields / False Bay beaches). Together with being highly mobile and global, it is unlikely that this project will fragment an existing population into two or more populations.</p> <p>D. Not Likely. The area of non-breeding occupancy is concentrated outside of the Project Area, with breeding habitat located in the northern hemisphere (DCCEEW 2024h). Given there is no breeding habitat, and no habitat critical to the survival of the species within the Project Area, habitat that is critical to the survival of this species will not be adversely affected.</p> <p>E. Not Likely. Given the species does not breed in Australia and critical feeding/roosting stopover habitat does not occur in the Project Area (DCCEEW 2024h), the breeding cycle of a population will not be impacted.</p> <p>F. Not Likely. Potential foraging/roosting habitat is only adjacent the Project Area and will be avoided. With additional mitigation measures, it is unlikely that quality habitat important to the survival of the species will be modified, destroyed or removed to the extent that the species will decline.</p> <p>G and H: Not Likely. As above critical habitat does not occur in the Project Area and no impacts are expected to suitable habitats south southeast of the Project Area (Whyalla Saltfields / False Bay beaches). As such, the Project Area is not thought to contain important habitat for this species. Regardless, standard mitigation measures will be implemented to manage the introduction of new weeds or the spread of existing weeds or diseases (e.g. as weed controls, vehicle hygiene practices, use of existing tracks, waste management). The Action is therefore not expected to result in the introduction of invasive species or disease which may cause this species to decline as a result of impacts to the species or the species' habitat.</p> <p>I. Not Likely. There is no specific recovery plan for this species, as conservation advice is considered adequate. Conservation Actions relate to preventing habitat loss, via habitat degradation, coastal development and human disturbance. Impacts to nearby non-core habitats in the Whyalla Saltfields / False Bay beaches will be avoided for ecological as well as cultural and constructability reasons, hence, with mitigation measures, the proposed Action is unlikely to interfere with recovery of the species.</p>
Hooded Robin (south eastern) (<i>Melanodryas cucullata cucullata</i>)	EN	R	<p>PMST suggests may occur in buffer area (5 km) of PSL Area only (Appendix A).</p> <p>Species was listed as EPBC threatened 31 March 2023 (DCCEEW 2023d).</p>	Unlikely to occur, N/A	None required.	<p>No Significant Impacts Expected.</p> <p>Criteria A, B, C, D, E, F, G, H and I not likely to be triggered as species is considered unlikely to occur in the Project Area.</p>

Species, or Community	EPBC Act ¹	NPW Act ²	Likelihood of Occurrence	Potential Impacts	Mitigations Measures	Significant Impact Assessment (impacts following project mitigation measures)
			<p>Occurs in south-eastern Australia from far south-east Queensland to Yorke Peninsula, South Australia.</p> <p>Two previous records within 5 km of the Project Area, spatial reliability is uncertain.</p> <p>Project Area occurs outside of the range of this subspecies, records are likely to be the common <i>M. c. westralensis</i>.</p> <p>This species is considered unlikely to occur adjacent the Project Area.</p>			
Blue-winged Parrot (<i>Neophema chrysostoma</i>)	VU	V	<p>PMST output suggests species or species habitat known to occur within PSL Area (Appendix A).</p> <p>Migratory parrot, recently EPBC listed (March 2023). Breeds in Tasmania and mainland Australia south of the Great Dividing Range in southern Victoria, and sometimes in the far south-east of South Australia.</p> <p>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 (Higgins 1999 cited in DCCEEW 2023c, Menkhorst et al. 2017).</p> <p>Inhabits a range of habitats from coastal, sub-coastal and inland areas, through to semi-arid zones. Favour grasslands and grassy woodlands and are often found near wetlands both near the coast and in semi-arid zones (Higgins 1999; Holdsworth et al. 2021 cited in DCCEEW 2023c). Also detected in altered environments such as airfields, golf-courses and paddocks. Will forage on saltmarsh (Davies at al 2022). The PSL Area occurs within the species occasional range.</p> <p>The Area of Occupancy of the species is considered to be 1,100,000 ha (Holdsworth et al. 2021 cited in DCCEEW 2023c).</p> <p>Woodland habitat with grassy understorey, saltmarsh and open chenopod areas may be suitable. This species was not observed during the surveys in the region to date, but was detected further north at Woomera and Carrapateena in 2023 (G. Smith, Z. Bull pers. obs.).</p> <p>No previous BDBSA records within 5 km of the Project Area (BDBSA 2023). One record (2020) in the broader region (Fitzgerald Bay) (ALA 2024), suitable overwinter foraging habitat present.</p> <p>Given the extremely broad distribution of this species through a range of different habitat types through their non-breeding period, and the occurrence of records of the species in the broader region, the species is considered potential to occur in the Project Area during inland migration periods.</p>	<p>Loss of potential general overwintering foraging habitat. No nesting occurs in the Project Area.</p> <p>Injury or mortality from collisions with vehicles or with powerlines</p> <p>Introduction of invasive weed species or disease.</p>	Refer Table 3.1, measures 1, 2, 3, 4, and 5.	<p>No Significant Impacts Expected.</p> <p>A. Not Likely. The Blue-winged Parrot favours open grassy woodlands and is predominantly found in the south-eastern portions of Australia, occasionally extending into arid and semi-arid Australia during non-breeding periods. As such, no important populations of the species are considered to occur in the Project Area. The total disturbance as a result of the Project is likely to represent a loss of occasional foraging habitat only (predominantly low open chenopod shrublands, with some clearance of mallee / myall and shrubland habitats), representing a very small fraction of total available habitat for this species across much of Australia. The Action is considered unlikely to lead to a long-term decrease in size of an important population of this species.</p> <p>B. Not Likely. The Project Area is unlikely to support a specific important population of this species, and the species does not breed in the semi-arid and arid regions of South Australia. Minor clearing of habitat potentially supporting taller trees (within chenopod shrubland and mallee areas) which are used by the species for roosting may be required, but will be managed to minimise tree clearance wherever practicable. Saltmarsh habitats will be avoided, and whilst chenopod shrublands will be cleared, almost 99% rehabilitation will occur of these areas. The temporary disturbance of general overwinter foraging and roosting habitat (102 ha) represents 0.009% of the species AOO and permanent disturbance represents 0.00002%. Given the high mobility of the species and presence during over winter periods only, once construction and rehabilitation is complete, the Action is unlikely to lead to a long-term reduction in the area of occupancy of an important population of this species.</p> <p>C. Not Likely. The Project Area is unlikely to support any population of note, with the species breeding in south-eastern mainland Australia and on Tasmania. As such, any disturbance of general foraging habitat represented by Myall / Chenopod / Mallee / Samphire vegetation within the Project Area (102 ha of temporary, 0.16 ha of permanent) is unlikely to fragment an existing population into two or more populations. An absence of larger areas of open grassy woodland which are preferred by the species is also noted. The Action is considered unlikely to cause fragmentation of any population into two or more populations, with no specific important populations documented for the species or Project Area.</p> <p>D. Not Likely. The Blue-winged Parrot prefers open grassy woodlands and is predominantly found in the south-eastern portions of Australia, occasionally extending into arid and semi-</p>

Species, or Community	EPBC Act ¹	NPW Act ²	Likelihood of Occurrence	Potential Impacts	Mitigations Measures	Significant Impact Assessment (impacts following project mitigation measures)
						<p>arid Australia during non-breeding periods. Surveys to date note an absence of open grassy woodlands within the Project Area (Jacobs 2023a, Infrastructure SA 2024, EBS 2023, Lathwida 2024b). As such, the Project Area is unlikely to support an important population of this species or any breeding activity. The majority of the Project disturbance is low open chenopod shrubland, taller Myall / Black oak / False Sandalwood / Bullock Bush shrubland, or mallee vegetation which is unlikely to adversely affect habitat critical to the survival of this species, particularly given the species is predominantly located in South-eastern Australia and does not breed in the Project Area or along the access routes.</p> <p>E. Not Likely. The Blue-winged Parrot breeds in localised areas restricted to the south-east of mainland Australia and Tasmania. As such, the Project will not disrupt the breeding cycle of the species.</p> <p>F. Not Likely. The Blue-winged Parrot is largely distributed across the south-east of mainland Australia and into Tasmania. It does not breed in the Project Area and prefers open grassy woodland, only occasionally extending into arid and semi-arid areas traversed by the Project. The Action is unlikely to significantly impact on habitat extent and quality which would lead to a decline in the species.</p> <p>G and H: Not Likely. As above there is no important population in the Project Area and the species does not breed in the locality. As such, any introduction of weeds is considered unlikely to result in establishment and degradation of preferred habitat which will be detrimental to the species. The Project Area is not in a high-risk (or medium risk) <i>Phytophthora</i> area (DIT 2021). Weed management controls during and post construction, as well as vehicle hygiene practices, will minimise the risk of establishment of new weed species or diseases in the Project Area. Existing tracks traverse the Project Area in numerous locations, so the proposal is not expected to result in an increase in abundance of feral predator species. The Action is therefore not expected to result in the introduction of invasive species or disease which are harmful to this threatened species or the species' habitat.</p> <p>I. Not Likely. There is currently no recovery plan in place for this recently listed species, though it is recommended that one be produced. There are no adopted recovery plans or threat abatement plans nominated for this species. The proposed Project will not interfere with the recovery of the species.</p>
Eastern Curlew, Far Eastern Curlew (<i>Numenius madagascariensis</i>)	CE, MW	E	<p>PMST output states that species or species habitat known to occur within PSL Area (Appendix A).</p> <p>Migratory wader / large shorebird. Breeds in NE Asia, Siberia and is a spring migrant to Australia where it is found in all states. Within Australia, has a primarily coastal distribution, with very few inland records. Its preferred habitat is coastal lakes, inlets, bays and estuaries where it occupies intertidal mudflats, particularly exposed seagrass beds (Geering et al. 2008, Menkhorst et al. 2017, DCCEEW 2023h).</p> <p>Critical habitat includes areas for breeding (which are outside of Australia), foraging, roosting or dispersal.</p>	<p>Injury or mortality from collisions with construction vehicles.</p> <p>Introduction of invasive weed species into non-core habitat or disease.</p> <p>Temporary disturbance associated with proximity to construction noise.</p>	Refer Table 3.1, measures 1, 2, 3, 4, and 5.	<p>No significant impacts expected.</p> <p>A. Not Likely. Important sites for the Eastern Curlew are listed in the Shorebird Directory (Weller et al. 2020) and these do not occur in the Study area and are not intersected by the Disturbance Footprint. With only occasional and low numbers of historic records of the species recorded in adjacent saltpans, it is considered that key populations of the species do not occur within the Project Area. With minimal impact to a small area of potential coastal habitat (e.g. noise adjacent Whyalla Saltfields, proximity to Port Bonython Road / False Bay beaches) the Project is therefore not expected to result in a long term decrease in the size of the Australian, or global population.</p>

Species, or Community	EPBC Act ¹	NPW Act ²	Likelihood of Occurrence	Potential Impacts	Mitigations Measures	Significant Impact Assessment (impacts following project mitigation measures)
			<p>Important habitat in Australia includes those areas listed in the national Directory of Important Migratory Shorebird Habitat (Weller et al. 2020; DCCEEW 2023h). In South Australia areas listed as important habitat in the Shorebird Directory include the Coorong and associated lakes, Gulf St. Vincent (Weller et al. 2020). These important habitat areas are not in the PSL Area and distant from the Disturbance Footprint.</p> <p>Few historical records around Whyalla (1980s), records concentrated around coastal areas, known bird sanctuaries (ALA 2024). No suitable seagrass habitat in the PSL Area. No BDBSA records within 5 km of PSL Area (BDBSA 2023), however one individual was recorded in 2023 Winter Birdlife surveys at the Whyalla Saltpans adjacent the Project Area (Birdlife 2024).</p> <p>Hence this species is considered likely to occur adjacent the Project Area and PSL Area in suitable coastal habitat.</p>			<p>B. Not Likely. The area of occupancy is widespread within Australia (and globally) for this migratory species which breeds outside of Australia (DCCEEW 2022c). Given no preferred habitat occurs within the Project Area, and potential foraging habitats can either be easily avoided or impact to these habitats minimise and concentrated adjacent existing disturbance, the area of occupancy for this species is not likely to be reduced.</p> <p>C. Not Likely. The area of occupancy is widespread in Australia for this migratory species, which breeds outside of Australia (DCCEEW 2023h). Given there is no breeding habitat, minimal preferred habitat, and no habitat critical to the survival of the species in the Project Area, only some habitat adjacent the Project Area that will be avoided, it is unlikely to support an existing population. Hence, the Project is unlikely to fragment an existing population into two or more populations.</p> <p>D. Not Likely. The area of occupancy is widespread within Australia for this migratory species, which breeds outside of Australia (Menkhorst et al. 2017, DCCEEW 2023h). Given there is no breeding habitat, minimal preferred habitat, and no habitat critical to the survival of the species within the Project Area, habitat that is critical to the survival of this species will not be adversely affected.</p> <p>E. Not Likely. Given the species does not breed in Australia (Geering et al. 2008), the breeding cycle of the population will not be impacted.</p> <p>F. Not Likely. There is no preferred habitat (i.e. coastal bays, Geering et al. 2008) that will be directly impacted within the Project Area, limited to the proximity to Whyalla Saltfields and beach habitats in False Bay (350 m from Port Bonython Road). Footprints will be minimised wherever possible, and particularly at the coastal interface. Therefore, quality habitat important to the survival of the species is unlikely to be modified, destroyed or removed to the extent that the species will decline.</p> <p>G and H: Not Likely. It is considered unlikely that a significant population of Eastern Curlew exists in the Project Area. As such, any introduction of weeds is not considered likely to result in establishment and degradation of preferred habitat. The Project Area is not in a high-risk <i>Phytophthora</i> area. Weed control measures during and post construction as well as vehicle hygiene practices, to minimise likelihood of establishment of new weed species or diseases in the Project Area. Tracks exist within the Project Area, so the proposal is not expected to result in an increase in abundance of feral predator species. The Action is therefore not expected to result in the introduction of invasive weed and pest species or disease which are harmful to this threatened species or species habitat and that may result in the species decline.</p> <p>I. Not Likely. There is no specific recovery plan for this species. Conservation Actions relate to loss of key habitat breeding habitat. Australian conservation Actions relate to reducing impacts from human disturbance, habitat loss, and invasive plants at key feeding grounds. Key feeding grounds do not occur within the</p>

Species, or Community	EPBC Act ¹	NPW Act ²	Likelihood of Occurrence	Potential Impacts	Mitigations Measures	Significant Impact Assessment (impacts following project mitigation measures)
						Project Area, therefore, with mitigation measures, the proposed Action is unlikely to interfere with the recovery of the species.
Plains Wanderer (<i>Pedionomus torquatus</i>)	CE	E	PMST suggests may occur in PSL Area (Appendix A). Rare and elusive, prefers sparsely vegetated grasslands, PSL Area is well outside core range and occasional range (Menkhorst et al. 2017). Key areas of the species' distribution include the Riverina region (NSW), eastern SA and west-central Queensland, and likely extant in the south-east of SA, eastern NSW and south-east Qld (DotE 2015b). Extensive grasslands unlikely in PSL Area, based on mapping and regional surveys. No records within 5 km (BDBSA 2023). Species is considered unlikely to occur in Project Area or PSL Area.	Unlikely to occur, N/A	None required.	No Significant Impacts Expected Criteria A, B, C, D, E, F, G, H and I not likely to be triggered as species is considered unlikely to occur in the Project Area.
Australian Painted Snipe (<i>Rostratula australis</i>)	EN	E	PMST suggests likely in PSL Area (Appendix A). Elusive bird occurs in freshwater wetland habitats with dense reeds and rushes/ well vegetated margins (Simpson and Day 2010, Menkhorst et al. 2017, DSEWPac 2013)). Has a widespread distribution across eastern and northern Australia (ALA 2024). No previous records within 5 km of the Study Area (BDBSA 2023). No suitable habitat within the Study Area. Species is considered unlikely to occur in the Project Area or PSL Area.	Unlikely to occur, N/A	None required.	No Significant Impacts Expected Criteria A, B, C, D, E, F, G, H and I not likely to be triggered as species is considered unlikely to occur in the Project Area.
Diamond Firetail (<i>Stagonopleura guttata</i>)	VU	V	PMST suggested may occur within PSL Area (Appendix A). Specie was added to the threatened fauna list under the EPBC on 31 March 2023 (DCCEEW 2023e). Species occurs on the south-east mainland of Australia from south-east Queensland to southern Eyre Peninsula, South Australia, (Higgins et al. 2007, cited in DCCEEW 2023e, DEW 2024). Prefers drier Eucalypt, Acacia or Casuarina woodlands, open forests and other lightly timbered habitats, including farmland and grassland with scattered trees (Menkhorst et al. 2017, Higgins et al. 2007 cited in DCCEEW 2023e). They prefer areas with relatively low tree density, few large logs, and little litter cover but high grass cover, foraging mostly on the ground (DCCEEW 2023e, Menkhorst et al. 2017). No previous records within 5 km of Project Area (BDBSA 2023). Nearest record are over 60 km south west of PSL Area and 30 km east across the Spencer Gulf (Nature Maps 2023). Woodland areas are present in the PSL Area but lack high grass cover. Has not been detected in surveys to date (Jacobs 2023a, 2023b, Infrastructure SA 2024, EBS 2023, Lathwida 2024b). Species is considered unlikely to occur in the Project Area.	Unlikely to occur, N/A	None required.	No Significant Impacts Expected Criteria A, B, C, D, E, F, G, H and I not likely to be triggered as species is considered unlikely to occur in the Project Area.
Australian Fairy Tern (<i>Sternula nereis nereis</i>)	VU	E	PMST output suggest species or species habitat known to occur within PSL Area (Appendix A). Occurs along coasts and estuaries, and breeds on sandy beaches or spits (Simpson & Day 2019, TSSC 2011). Along	Injury or mortality from collisions with construction vehicles.	Refer Table 3.1, measures 1, 2, 3, 4, and 5.	No significant impacts expected. A. Not Likely. This species occurs along the coast of the southern two thirds of Australia, where it forages offshore, in estuaries and wetlands. A known 'Seabird - Fairy Tern site' occurs at the 'Whyalla

Species, or Community	EPBC Act ¹	NPW Act ²	Likelihood of Occurrence	Potential Impacts	Mitigations Measures	Significant Impact Assessment (impacts following project mitigation measures)
			<p>the coast, this sub-species generally nests on sandy beaches and banks above the high tide line and below vegetation. Will roost on jetty structures.</p> <p>The sub-species' distribution extends along the coasts of South Australia, Tasmania, and central Western Australia, and there are a number of breeding sites along the EP, some near Coffin Bay, Port Lincoln and across the Gulf at the base of Yorke Peninsula (ALA 2024, DEW 2024).</p> <p>Previous records (2006, 2019) within 5 km of the Project Area in Whyalla salt evaporation pans / saltfields (BDBSA 2023). The species was also detected during winter surveys in 2023 (4 birds) (Birdlife 2023). The 'Whyalla Saltfields' are listed as coastal seabird site (population 11 to 50, breeding September to December) (DEW 2024).</p> <p>May occur in PSL Areas immediately adjacent Whyalla Saltfields, in open areas amongst stranded saltmarsh following rainfall, and on False Bay beaches.</p> <p>Species is considered likely to occur adjacent the Project Area and PSL Area.</p>	<p>Introduction of invasive weed species into non-core habitat or disease.</p> <p>Temporary disturbance associated with proximity to construction noise.</p>		<p>Saltfields' immediately adjacent the Project Area, a small colony of up to 50 birds (DEW 2024). Breeding occurs in nests on sheltered sandy beaches, spits and banks above the high tide line and below vegetation. No important populations are defined for the species, but many populations are recorded, with the largest in WA (6000 birds (DAWE 2020). Coastal habitats of this species will be avoided, the only impacts may include temporary noise impacts from construction activities. Given beach habitats are avoided and an important population is not known from the Project Area (rather a small colony near the centre of the Project Area), it is unlikely the Project will lead to a long-term decrease in the size of an important population.</p> <p>B. Not Likely. The area of occupancy of this species is widespread along the southern two thirds of Australia's coastline and there are no important populations defined for this species. The species is highly mobile and any non-breeding birds will be able to move away from any temporary disturbance (e.g. associated with construction noise in areas within proximity to stranded saltmarsh / False Bay beaches south of Port Bonython Road). Breeding is known to occur along the coastline of the EP, and in the saltfields adjacent the Project Area. However, the Project Disturbance Footprint excludes beach habitat, hence the Action is unlikely to reduce the area of occupancy of an important population of this species.</p> <p>C. Not Likely. As above, there are no important populations defined for the species, and although a small colony is known to occur in the adjacent Whyalla Saltfields, this highly mobile species will easily avoid the temporary disturbance in proximity to coastal areas. Hence, it is unlikely the Action will fragment an existing important population into two or more populations.</p> <p>D. Not Likely. The Project Area does not contain beach habitat, but rather there is known habitat south of Port Bonython Road and southeast of the Whyalla Saltfields. Given beach habitat will be avoided, it is very unlikely that the Project will affect habitat critical to this coastal species which breeds on sandy beaches and forages (for small fish) offshore or in estuaries and wetlands near the coast.</p> <p>E. Not Likely. Given the species breeds on sandy beaches, a habitat which will be avoided by the Project and no important populations have been defined for the species (DAWE 2020), the breeding cycle of an important population is unlikely to be impacted. There may be negligible impacts to a small known colony that occurs in the adjacent Whyalla Saltfields, however mitigation measures will minimise the likelihood of long-term impacts and no impacts to the breeding cycle of an 'important population' are expected.</p> <p>F. Not Likely. There is no breeding habitat present within the Project Area. There are records of this species and a small colony from the adjacent Whyalla saltworks and beach areas abutting the Project Area (from 2019, BDBSA 2023, DEW 2024). Regardless, footprints will be minimised wherever possible, and particularly at the coastal interface. Therefore, quality habitat important to the</p>

Species, or Community	EPBC Act ¹	NPW Act ²	Likelihood of Occurrence	Potential Impacts	Mitigations Measures	Significant Impact Assessment (impacts following project mitigation measures)
						<p>survival of the species is unlikely to be modified, destroyed or removed to the extent that the species will decline.</p> <p>G and H: Not Likely. A known small colony of this beach-nesting species occurs adjacent the Project Area, in the Whyalla Saltfields (11-50 birds, breeding between September to Dec). Key threats to the species include bikes, dogs, horses, vehicles, and drones as well predation by introduced species and native birds (TSSC 2011). Given the species nests on cleared beach areas, if coastal sites become covered with weeds they can be unusable (DAWE 2020). Management measures include weed controls during and post construction as well as vehicle hygiene practices, and avoiding beach disturbance, hence establishment of new weed species or diseases in the Project Area is not considered likely. Measures such as use of existing tracks and waste management, are not expected to result in an increase in abundance of feral predator species. The Action is therefore not expected to result in the introduction of invasive weed or species or disease which may cause this species to decline as a result of impacts to the species or the species' habitat.</p> <p>I. Not Likely. The species recovery plan includes a number of key strategies (DAWE 2020). Strategies that are relevant to the Project include managing known breeding populations, reducing or eliminating threats at breeding, non-breeding and foraging sites. A known breeding site for a small colony occurs adjacent the Project Area (Whyalla Saltfields). Mitigation measures are proposed to avoid direct and indirect impacts, the proposed Action is unlikely to interfere substantially with recovery of the species.</p>
Eastern Hooded Plover (<i>Thinornis cucullatus cucullatus</i>)	VU	V	<p>PMST output suggests species or species habitat known to occur within PSL area (Appendix A).</p> <p>The sub-species mainly occurs on wide beaches backed by dunes, in creeks or inlet entrances. Known to occur on many South Australian beaches, including some with human activity / presence. In South Australia the coastlines of Kangaroo Island and Yorke Peninsula are considered important to the species.</p> <p>No previous spatially records within 5 km of the Project Area (BDBSA 2023).</p> <p>May occur in PSL Areas immediately adjacent salt pans and open areas amongst stranded saltmarsh following rainfall, and beach habitats south of Port Bonython Road.</p> <p>Breeding territories and non-breeding flocking sites are of high conservation significance.</p> <p>This species is unlikely to occur in the Project Area or PSL Area, but has the potential to occur adjacent the Project Area and the PSL Area in beach habitats south of Port Bonython Road.</p>	<p>Injury or mortality from collisions with construction vehicles.</p> <p>Introduction of invasive weed species into non-core habitat or disease.</p> <p>Temporary disturbance associated with proximity to construction noise.</p>	Refer Table 3.1, measures 1, 2, 3, 4, and 5.	<p>No significant impacts expected.</p> <p>A. Not Likely. This species occurs from Jervis Bay in NSW to Fowlers Bay in SA, as well as Tasmania and various offshore islands such as Kangaroo Island, King Island and Flinders Island. It is documented at several sites along the coastline of the EP (DotE 2014b; ALA 2023). Whilst the species is unlikely to occur within the Project Area, they likely occur in adjacent beach habitats south of Port Bonython Road that will be avoided by the Project. They occupy ocean beaches, particularly wide beaches backed by dunes with large amounts of seaweed, creek mouths and inlet entrances. They can also occur near-coastal saline and freshwater lakes and lagoons, tidal bays and estuaries, on rock platforms, or on rocky or sandy reefs close to shore. Breeding occurs on beaches, with nests located on flat areas above the high tide mark, on stony terraces adjacent to beaches, or on the sides of sparsely vegetated dunes (DotE 2014b). No specific areas of coastline that are considered important to the Eastern Hooded Plover are within or adjacent the Project Area. Hence, the Action is unlikely to lead to a long-term decrease in the size of an important population.</p> <p>B. Not Likely. The area of occupancy of this species is widespread along coastline of southeast Australia and there are no coastlines considered significant to the species within the Project Area. Beach habitats will not be directly impacted by the Project. Although breeding is possible along the coastline of the Eyre Peninsula, the extent of direct impact occurring in proximity to</p>

Species, or Community	EPBC Act ¹	NPW Act ²	Likelihood of Occurrence	Potential Impacts	Mitigations Measures	Significant Impact Assessment (impacts following project mitigation measures)
						<p>beach areas (e.g. south of Port Bonython Road ~350 m, buffered by coastal and mallee vegetation and the existing road), is very small, and unlikely to reduce the area of occupancy of an important population of this species.</p> <p>C. Not Likely. As above, there are no coastline populations with significance to the species within the Project Area, and this mobile beach nesting species will avoid any minor disturbance (primarily indirect construction noise) to nearby beach areas, if they occur southeast of the Whyalla Saltfields. As such, it is unlikely the Action will fragment an existing population into two or more populations.</p> <p>D. Not Likely. Given critical beach habitat does not occur within the Project Area and the area of coastline being indirectly disturbed by the Project is minimal. It is very unlikely that the Project will affect habitat critical to the survival of the species.</p> <p>E. Not Likely. Given the species breeds on beaches, which are avoided by the Project and that no important population is known within or adjacent the Project Area, (Weller et al. 2020), it is unlikely the breeding cycle of an important population will be impacted.</p> <p>F. Not Likely. There is no breeding habitat present within the Project Area, and beach habitat south of Port Bonython Road for a small area of the pipeline corridor, which is 350 m from proposed disturbance will be avoided. There are historical records, indicating the species has potential to occur in these nearby beach areas (DEW 2024). Regardless, disturbance footprints will avoid these areas. Therefore, quality habitat important to the survival of the species is unlikely to be modified, destroyed or removed to the extent that the species will decline.</p> <p>G and H: Not Likely. As above critical beach habitats will be avoided by the Project and weed and pest mitigation measures will be in place (e.g. use of existing tracks, vehicle hygiene, waste management). The Action is therefore not expected to result in the introduction of invasive weed or pest species or disease which may cause this species to decline or impact the species habitat.</p> <p>I. Not Likely. There is no specific recovery plan for this species. Conservation Actions relate to preventing loss of key habitat for breeding and foraging. Core breeding and foraging grounds do not occur within the Project Area, therefore, with mitigation measures, the proposed Action is unlikely to interfere with recovery of the species.</p>
Common Greenshank (<i>Tringa nebularia</i>)	EN, MW	-	PMST output suggests species or species habitat is known to occur in the PSL Area (Appendix A). Newly listed as an EPBC listed threatened species (5 Jan 2023). Migratory shorebird, that has extensive breeding grounds in Europe / Siberia (DCCEEW 2024i). Has a widespread distribution throughout Australia, in summer (Geering et al. 2008, ALA 2023, DCCEEW 2024i). The species arrives in Australia from Aug to Oct / Nov (Menkhorst 2017). Occurs throughout most of eastern SA, including a few records in the Flinders Ranges and further inland (DCCEEW 204i). Occurs in all types of wetlands (fresh and saltwater) along the coast or inland as well as intertidal mudflats, in locations	Injury or mortality from collisions with construction vehicles. Introduction of invasive weed species into non-core habitat or disease. Temporary disturbance associated with proximity to construction noise.	Refer Table 3.1, measures 1, 2, 3, 4, and 5.	<p>No significant impacts expected.</p> <p>A. Not Likely. This species has widespread distribution at fresh and saltwater wetlands and is known to occur at the 'Whyalla Saltfields' immediately adjacent the Project Area. Breeding does not occur in Australia. Coastal habitats of this species will be avoided, the only impacts may include temporary noise impacts from construction activities. Given beach habitats are avoided and a population is not known from the Project Area, it is unlikely the Project will lead to a long-term decrease in the size of important population.</p> <p>B. Not Likely. The area of occupancy of this species is widespread. The species is highly mobile and any non-breeding</p>

Species, or Community	EPBC Act ¹	NPW Act ²	Likelihood of Occurrence	Potential Impacts	Mitigations Measures	Significant Impact Assessment (impacts following project mitigation measures)
			<p>near mangroves, saltmarsh and or with fringing sedges (Geering et al. 2008, DCCEEW 2024i). Also occupies artificial habitats, and will also forage on seagrass wrack on beaches. There are previous records (1998,2006, 2017, 2019) within 5 km of the PSL Area in Whyalla salt evaporation pans (BDBSA 2023, ALA 2024).</p> <p>Critical habitat includes areas for breeding (outside of Australia), foraging, roosting or dispersal. Important habitat includes those listed in the National Directory of Important Migratory Shorebird Habitat (Weller et al. 2020) (DCCEEW 2024i). Critical feeding and roosting habitats are associated with mosaic of feeding and roosting habitat, i.e. variety of freshwater, marine or artificial wetlands, as well as flooded grasslands, coastal flats (DCCEEW 2024i).</p> <p>No important populations known for the Study Area (Weller et al. 2020).</p> <p>Known to occur in adjacent Whyalla Saltfields. Species has potential to occur adjacent to the Project Area or in the PSL Area immediately adjacent salt pans and open areas amongst stranded saltmarsh following rainfall.</p>			<p>birds will be able to move away from any temporary disturbance (e.g. associated with construction noise in areas within proximity to stranded saltmarsh with water present / Whyalla Saltfields/ False Bay beaches south of Port Bonython Road). The Project disturbance excludes beach habitats and the Whyalla Saltfields and will avoid low lying areas for constructability, hence the Action is unlikely to reduce the area of occupancy of this species.</p> <p>C. Not Likely. As above, there are no populations known to occur in the adjacent Whyalla Saltfields, rather occasional records. This highly mobile species will easily avoid the temporary disturbance in proximity to coastal areas. Hence, it is unlikely the Action will fragment an existing population into two or more populations.</p> <p>D. Not Likely. The Project Area does not contain beach or wetland habitats, but there is known habitat in the adjacent Whyalla Saltfields and beaches south of Port Bonython Road. Given beach / saltfield habitat will be avoided, it is very unlikely that the Project will affect habitat critical to this species (mosaic of feeding and roosting habitat).</p> <p>E. Not Likely. Given the species breeds outside of Australia, roosting / feeding habitat will be avoided by the Project and no important populations have been defined for the species (Weller et al. 2020) in the Project Area, the breeding cycle of a population is unlikely to be impacted.</p> <p>F. Not Likely. There is no breeding habitat present within the Project Area. There are records of this species from the adjacent Whyalla Saltfields and beach areas southeast/south of the Project Area (from 2019, BDBSA 2023, DEW 2024). Regardless, these areas will be avoided. Therefore, quality habitat important to the survival of the species is unlikely to be modified, destroyed or removed to the extent that the species will decline.</p> <p>G and H: Not Likely. Species has been recorded at the Whyalla Saltfields. Key threats include reduction in quality of habitat in East Asian – Australasian Flyway (EAAF). Quality habitat areas do not occur in the Project Area. Management measures (e.g. weed controls during and post construction, vehicle hygiene practices, hence avoid establishment of new weed species or diseases in the Project Area is not considered likely. Measures such as use of existing tracks and waste management, are not expected to result in an increase in abundance of feral predator species. The Action is therefore not expected to result in the introduction of invasive weed or species or disease which may cause this species to decline as a result of impacts to the species or the species’ habitat.</p> <p>I. Not Likely. There is no species recovery plan, but conservation strategies are considered sufficient. Key threats relate to habitat loss, sea level rise and disturbance at feeding and roosting sites. Mitigation measures are proposed to avoid direct and indirect impacts, the proposed Action is unlikely to interfere substantially with recovery of the species.</p>

Species, or Community	EPBC Act ¹	NPW Act ²	Likelihood of Occurrence	Potential Impacts	Mitigations Measures	Significant Impact Assessment (impacts following project mitigation measures)
Threatened Fauna - Reptiles						
Flinders Ranges Worm Lizard (<i>Aprasia pseudopulchella</i>)	VU	-	PMST suggests likely in PSL Area (Appendix A). A very small, worm-like, burrowing lizard with no obvious external ear opening (Cogger 2000). It burrows freely in loose sand and soil, under rocks and litter. Occurs in open woodland, native tussock grassland, riparian habitats and rocky isolates. Prefers stony soils, or clay soils with a stony surface, and has been found sheltering beneath stones and rotting stumps. This species has a highly restricted distribution to the Mount Lofty Ranges, Mid North and Flinders Ranges in South Australia (ALA 2024). Records are geographically separate from the Project Area (ALA 2024). No records within 5 km of PSL Area (BDBSA 2023). This species is considered unlikely to occur in the Project Area or PSL Area.	Unlikely to occur, N/A	None required.	No Significant Impacts Expected. Criteria A, B, C, D, E, F, G, H and I not likely to be triggered as species is considered unlikely to occur in the Project Area.
Threatened Fauna - Mammals						
Sandhill Dunnart (<i>Sminthopsis psammophila</i>)	EN	E	PMST suggests likely in PSL Area (Appendix A). Large marsupial mouse. Occurs in sandy, arid and semi-arid areas, with specific habitat requirements that include spinifex hummocks. Restricted to EP and Great Victoria Desert. Nearest records to the PSL are in the Middleback ranges over 46 km west of the PSL Area (ALA 2024, DEW 2024). No records within 5 km (BDBSA 2023), no suitable habitat present. This species is considered unlikely to occur in the Project Area or the PSL Area.	Unlikely to occur, N/A	None required.	No Significant Impacts Expected. Criteria A, B, C, D, E, F, G, H and I not likely to be triggered as species is considered unlikely to occur in the Project Area.
Migratory Species (excludes those already considered as threatened species above)						
Migratory Waders (Functional Group)						
Common Sandpiper (<i>Actitis hypoleucos</i> , PMST suggests known), Sanderling (<i>Calidris alba</i> , PMST suggests likely) Pectoral Sandpiper (<i>Calidris melanotos</i> , PMST suggests known) Red-necked Stint (<i>Calidris ruficollis</i> , PMST suggests known) Oriental Plover / Oriental Dotterel (<i>Charadrius veredus</i> , PMST suggests may occur), Pin-tailed Snipe (<i>Gallinago stenura</i> , PMST suggests known)	MW	-	PMST output suggests migratory wader species or species habitat, known, likely or possibly occurring within PSL area (Appendix A). These species mostly migrate from the northern hemisphere, and are non-breeding visitors to Australia. Habitats preferences vary from predominantly coastal or near-coastal / intertidal (Sanderling, Pectoral Sandpiper, Bar-tailed Godwit), to predominantly inland (Pin-tailed Snipe, Ruff), or shallow water generalists that range between coastal and inland wetted environments (Common Sandpiper, Oriental Plover and Little Greenshank). Suitable habitat for these species exists predominantly adjacent the PSL Area in the Whyalla Saltfields/Salt pans, and areas of stranded saltmarsh with claypans that may temporarily fill with water following rainfall as well as beach areas south of Port Bonython Road, 350 m at the closest point to the disturbance area (separated by mallee / Port Bonython Road / mallee and coastal shrubland).	Injury or mortality from collisions with construction vehicles. Introduction of invasive weed species into non-core habitat or disease. Temporary disturbance associated with proximity to construction noise.	Refer Table 3.1, measures 1, 2, 3, 4, and 5.	No significant impacts expected. A. Not likely. The Project Area avoids impacts to wetted or ephemeral environments, which may represent foraging habitat for migratory wader species. Where the alignment passes adjacent stranded saltmarsh / Whyalla Saltfields (>650 m -1 km away) / beach areas >350 m south of Port Bonython Road, the pipeline is co-located to align with existing infrastructure (roads and tracks) and is on the opposite side of Port Bonython Road when in proximity to these areas. The majority of these migratory waders breed overseas and in areas that will not be influenced by this Project. Whilst core feeding areas are not within the Project Area, habitats in the adjacent Whyalla Saltfields might be temporarily used by some migratory species on the way to core feeding grounds, however these areas will not be directly impacted by the Project. Indirect impacts from sedimentation are not likely as Port Bonython Road prevents drainage from the pipeline alignment to nearby habitats. As such, the Action will not substantially modify, destroy or isolate an area of important habitat for a migratory wader species.

Species, or Community	EPBC Act ¹	NPW Act ²	Likelihood of Occurrence	Potential Impacts	Mitigations Measures	Significant Impact Assessment (impacts following project mitigation measures)
Bar-tailed Godwit (<i>Limosa lapponica</i> , PMST suggests known) Ruff (Reeve) (<i>Philomachus pugnax</i> , PMST suggests known) Marsh Sandpiper, Little Greenshank (<i>Tringa stagnatilis</i> , PMST suggests known),			Hence migratory waders are assessed as potential to likely to occur adjacent the Project Area and PSL Area, but unlikely to occur in the Disturbance Footprint, unless there are pools of water present and the species are visiting the region (via the Whyalla Saltfields).			B. Not likely. Mitigation measures proposed will control the spread of existing and new weed and pest species during construction and operation of the Project. Existing service corridors and tracks run through the Project Area, and predator species are already present. Any additional tracks are unlikely to increase the existing level of invasive species presence. The Project is not expected to impact on important habitat features to migratory wader species, such as intertidal beach areas and there are no inland ephemeral lakes or wetland areas present within the PSL Area. C. Not likely. The project is not located in an area where an ecologically significant proportion of a population of migratory species exists. Potential foraging habitat adjacent the Project Area will be avoided. The Project will not seriously disrupt the life cycle of an ecologically significant proportion of the populations of migratory species.
Migratory Marine Avifauna (Functional Group)						
Fork-tailed Swift (<i>Apus pacificus</i>)	MM	-	PMST suggests species or habitat is likely within the PSL Area (Appendix A). Highly mobile species, almost entirely aerial, and rarely recorded on the ground. Has a widespread distribution across Australia, in summer (ALA 2023). No previous records within 5 km of the Project Area (BDBSA 2023). However, a flock of approximately 200 were detected during Lathwida survey 2 (March 2024b), the flock was aerial (200m in the air), above coastal vegetation / mallee areas. Whilst the species is known as an overfly species, it is considered unlikely to occur on or near terrestrial vegetation in the Project Area, PSL Area and Disturbance Footprint.	Unlikely to occur, N/A	None required.	No Significant Impacts Expected Criteria A, B, C not likely to be triggered as species is an overfly species and is considered unlikely to occur on or near terrestrial vegetation in the Project Area.
Grey Wagtail (<i>Motacilla cinerea</i>), Yellow Wagtail (<i>Motacilla flava</i>)	MM		PMST suggests these species or habitat may occur within the PSL Area (Appendix A). Both of these wagtail species are uncommon migratory birds that favour fast-flowing streams and watercourses (Grey Wagtail) or damp wet habitats such as bogs or marshes, wetlands, roost in mangroves (Yellow Wagtail). Both are rarely recorded in SA, primarily from northern coastlines or tropics (Davies et al. 2022, ALA 2024). There are no records within 5 km of the PSL Area (BDBSA 2023). There is no suitable habitat for either species in the PSL Area or adjacent. Both species are considered unlikely to occur in the Project Area or PSL Area.	Unlikely to occur, N/A	None required.	No Significant Impacts Expected Criteria A, B, C not likely to be triggered as species is considered unlikely to occur in the Project Area.
Osprey (<i>Pandion haliaetus</i>)	MM	E	PMST suggests species or species habitat known to occur within buffer area (5km on PSL Area) (Appendix A). Large coastal fish eating raptor. Species distribution includes all coastal areas of Australia, also occurs around the world. Nests on coastal cliffs in SA, but also known to use artificial substrates, transmission line towers, utility poles, boat masts in marinas (Menkhorst et al. 2017, ALA 2024).	Unlikely to occur, N/A	None required.	No Significant Impacts Expected Criteria A, B, C not likely to be triggered as species is considered unlikely to occur in the Project Area.

Species, or Community	EPBC Act ¹	NPW Act ²	Likelihood of Occurrence	Potential Impacts	Mitigations Measures	Significant Impact Assessment (impacts following project mitigation measures)
			No records within 5 km of PSL Area (BDBSA 2023). No known nests detected in the PSL Area to date. Key known breeding areas are largely coastal (cliffs), and in South Australia the species extends from the head of the Bight to Cape Spencer and Kangaroo Island (DCCEEW 2024b) and occurs in small and fragmented locations (Dennis 2007). Records for this species more commonly occur on the west coast and southern portion of EP. Critical habitat does not occur in the PSL Area. Core populations and breeding areas occur well outside the Project Area. Species and species habitat is considered unlikely to occur in the Project Area or PSL Area.			

4 Further assessment of residual impacts to known MNES species

Three key species are known to occur and have habitat in the PSL Area; the Western Grasswren, the Southern Whiteface and the Malleefowl. These species are considered in further detail below using significant impact criteria related to direct and indirect impact (vegetation clearance) to Areas of Occupancy (AOO) as outlined in DotE (2013). Initial information per species, against all relevant the DotE criteria is provided in Table 3.2.

As discussed in detail below, the potential impacts to these species are not considered to be significant.

4.1 Western Grasswren (*Amytornis textilis myall*)

The Western Grasswren is currently listed as Vulnerable under the EPBC Act, and the NPW Act. The Western Grasswren is known to occur in the PSL Area (Table 3.2). The species has been detected in low open Western Myall woodlands over chenopod in fenced areas of the PSL Area proposed for solar farms (DEW 2024) and immediately east of Lincoln Highway (north and south of Port Bonython Road) in similar habitat and areas mapped as Chenopod with emergent trees (EBS 2023). The species was also detected at three song meter sites as part of field surveys for the current assessment; located east of Lincoln Highway (Lathwida 2024) (Figure 4.1). The habitat where the species was detected via song meter was generally considered suboptimal, given the cover of Ward's Weed, presence of predators, reduced cover of chenopods and minimal spiny shrubs, however there was presence of Western Myall, as well as Black Oak, Bullock Bush and False Sandalwood for roosting. The PSL Area east of Lincoln Highway does not contain any 'preferred habitat' of drainage lines with dense Black Bluebush (*Maireana pyramidata*) (Figure 1.4). Based on anecdotal evidence, the species has been undergoing a 'boom' period over the last couple of years, being detected throughout its range in both preferred, atypical and suboptimal habitats where they haven't been detected previously (including east of Lincoln Highway and areas southwest of Whyalla (Jacobs 2023a, 2023b, Infrastructure SA 2024, EBS 2023, Lathwida 2024b). There are also areas of suitable habitat in DoD land east of Lincoln Highway / Fitzgerald Bay Road, however some of these areas have had little survey effort given access issues and risk of Unexploded Ordinances (UXOs).

As mentioned above (Table 3.2), the threatened species advice suggests all populations of the species are considered to have high conservation value (DotE 2014b). More recently, the Action Plan for Australian Birds and IUCN assessments data, suggest there is one subpopulation of approximately 12,000 individuals (Garnet and Baker 2021). This population is known to extend west to northwest of Whyalla for approximately 170 km (Figure 4.2). It is thought that approximately 20% of the Western Grasswren population occurs within the Department of Defence (DoD) Cultana Training Area near Whyalla (DotE 2014a). The Cultana Training Area is contiguous with and northwest of the Whyalla CP, which also has clusters of BDBSA records. The PSL Area abuts, but avoids, the Whyalla CP along Lincoln Highway (Figure 1.4). The majority of the Project will occur east of the Lincoln Highway, which is on the edge of the species known Area of Occupancy, but given the recent records in this area, is a minor eastern extension of the species AOO. The individuals detected east of the Lincoln Highway would be considered part of small family groups on the edge of the entire population which spans over 170 km / 252,500 ha. Western Grasswrens are usually seen in pairs or small groups, but sometimes occur singly (Black and Gower 2017). There is little data on territory size, but in Western Australia, another subspecies is thought to occupy 1.2 to 2 ha during good seasons (Brooker 1998a, 1998b cited in EBS 2023). Recent estimates by EBS (2023) suggest that the AOO for the SA population is 252,500 ha and the Extent of Occurrence (EOO) is 1,501,586 ha (Figure 4.2).



Figure 4.1: Conservative habitat mapping for Western Grasswren and records around the PSL Area and Project Area

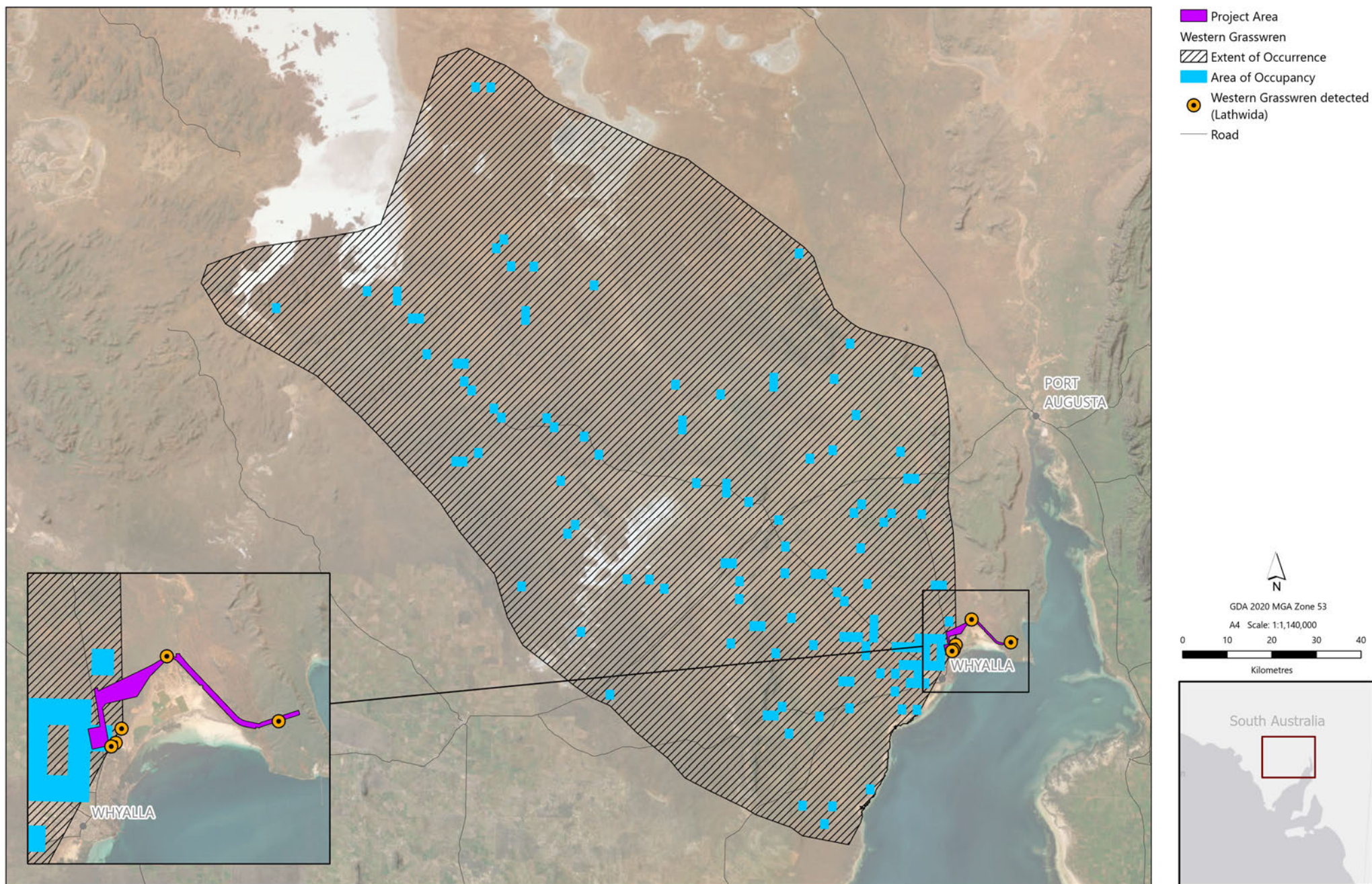


Figure 4.2: Western Grasswren Area of Occupancy and Extent of Occurrence

4.1.1 Potential impact pathways

Potential impact pathways resulting from construction activities in the Project Area that may affect the Western Grasswren and/or Western Grasswren habitat include the following:

- clearance of potential habitat (via vegetation clearance) for proposed infrastructure
- introduction of invasive weed species resulting in habitat degradation
- increase feral animal predation and/or competition for resources from feral prey species.

Direct and indirect impacts are discussed in Section 4.1.3.

4.1.2 Mitigations measures

The identification and implementation of mitigation measures to reduce the incidence and/or impact of construction activities on the Western Grasswren include the following:

- Avoid any identified areas of higher density preferred chenopod/spiny shrublands, where practicable.
- Flag off any potential habitat identified adjacent to proposed infrastructure areas to ensure no disturbance beyond the essential clearance footprint required.
- Undertake pre-construction weed surveys and controls, post-construction weeds surveys and controls, and ongoing weed survey and control during operation.
- Undertake daily inspection of open trenches during working cycle with any fauna handling or removal to be undertake in accordance with statutory requirements (e.g. the *National Parks and Wildlife Act 1972* (SA), *Animal Welfare Act 1985* (SA)).
- Minimise (as far as practicable) the amount of time the trench or bore hole is open.
- Develop and implement clear protocols for management of waste during construction to avoid an increase in, or attraction of, feral pest animals to the Project Area.
- Rehabilitate disturbed areas following the completion of the construction activities, noting opportunities to undertake progressive rehabilitation will be identified and implemented. Rehabilitation methodologies, including the respread of vegetation (including tree branches) and topsoil (in the reverse order of clearance) and additional reseeding with selected local species that are suitable for Western Grasswren will be described in the EIR and CEMP.

4.1.3 Impact assessment – further detail

This section provides further assessment of potential residual impacts following mitigation measures, against the significant impact criteria outlined in Table 2.4. As per the summary in Table 3.2, the outcome of the assessment is that **significant impacts are considered unlikely**.

Direct Impact

Construction of the Project will require temporary new clearing of up to 76 ha of habitat for Western Grasswren (35 ha suitable, 41 ha low suitability) as shown in Table 4.1. Highly conservative habitat mapping is provided in Figure 4.1 showing the extent of suitable and low suitable habitat (combined) for the species across the Project Area. Noting the bulk of this is east of the range of previous records for the species. Construction areas, that do not form part of the operational footprint, will be rehabilitated to achieve environmental and other important project outcomes such as amenity and dust control. As is general practice in the arid lands, this will involve ripping compacted soil where necessary and reinstating stockpiled topsoil and cleared vegetative material to facilitate natural regeneration. Additional reseedling will be undertaken with selected local species that are suitable for Western Grasswren. Consequently, habitat loss on these areas (over 99% of the Disturbance Footprint) is expected to be temporary.

Table 4.1: Estimated (worst case) direct impact Western Grasswren

Habitat Suitability	Construction Temporary Disturbance Footprint (ha)	Existing Disturbance (ha)	Total New Disturbance (ha)	Operational Disturbance Footprint (ha)
Suitable (Western Myall chenopod shrubland +/- Black Oak, Bullock Bush, False Sandalwood and Chenopod open shrublands +/- emergent trees, mixed shrubland in drainage line)	51.87	16.65	35.23	
Low suitable (Low open Chenopod shrublands and Chenopod / Samphire on plains or infrequent inundation)	49.68	8.74	40.94	0.16
Total (ha)	101.56	25.39	76.17	0.16

As per, Table 4.1, the temporary clearance of ~76 ha (35 ha suitable, 41 ha low suitable), represents a negligible impact within the Area of Occupancy (AOO). It is noted that areas of the PSL Area east of Lincoln Highway are on the eastern edge of the species AOO and newer records are part of a minor range extension into suboptimal habitat across a busy highway and in areas that have had reduced survey as they were previously on DoD land. Whilst the species has been detected close to Lincoln Highway and

recent survey results suggest they extend along Port Bonython Road, and along Fitzgerald Bay Road, they have not been detected closer to Pt. Bonython to date where Chenopod shrubland is very low and less suitable (potentially due to less survey effort in areas previously owned by DoD).

For assessment of significance of impact, the approach follows Garnet and Baker (2021) that the AOO is likely to be greater than '10% of the EOO (Extent of Occurrence) at its core in the Whyalla-Iron-Knob corridor' (AB Black cited in Garnet and Baker 2021), where the estimated EOO is 1,900,000 ha (i.e. AOO = 190,000 ha). More recently, EBS (2023), remapped the EOO (1,501,586 ha) and estimated the AOO as 2,525 km² (i.e. 252,500 ha) (Figure 4.2).

Based on the above and implementation of the mitigation measures in Table 3.1 and Section 4.1.2, the long-term significant impact from the direct (temporary) clearance of up to 76 ha of suitable/low suitable (but not highly preferred habitat) is considered negligible. These conservative clearance estimates represent at most 0.03% of the species habitat on the edge or outside the AOO, that will be temporarily impacted, and 0.0001% of the species habitat (0.16 ha) will be permanently lost (primarily to permanent operational facilities such as the valve station, in low chenopod shrublands).

Vegetation clearance will be minimised as far as reasonably practicable during construction of the Project. Any long-term impacts to temporary clearance areas will be minimised by rehabilitation (via passive rehabilitation techniques and additional reseeding). To preserve the infrastructure and obtain faster results shallow rooted species will be encouraged/used, such as Black Bluebush (*Maireana pyramidata*), Australian Boxthorn (*Lycium australe*), Pearl Bluebush (*Maireana sedifolia*) and Bladder Saltbush (*Atriplex vesicaria*). These common low chenopod species readily recolonise the disturbance areas, particularly in the absence of grazing pressure (which is the case here). Additional predator control in fenced areas (e.g. adjacent solar farm areas) will also facilitate a suitable environment for the Western Grasswren. It is worth noting the PSL Area impact areas primarily occur in range extension areas, across a highway, rather than core preferred habitats that occur northwest of Whyalla in drainage lines, the majority of which are in the DoD Cultana area (DEW 2024, EBS 2023).

Indirect Impacts

Potential indirect impacts to Western Grasswren as a result of the Action, include lighting, stormwater/surface flows, dust and emissions and noise during the construction phase.

Given the pipeline is predominantly underground, lighting will primarily be associated with vehicle and personnel access and security, rather than significant operations. Western Grasswren are active during dawn till dusk, hence night-time lighting is not expected to adversely impact the species.

Stormwater management could impact vegetation if runoff is altered, and this could actually benefit the species if preferred chenopod species thrive in such areas. However, the Project occurs in a relatively flat environment, some areas adjacent the major road are already impacted by changes in drainage. Additional changes would be very minor and are not expected to impact Western Grasswren, assuming standard design protocols are followed and any impact areas are controlled for weeds.

Dust generated during construction will be managed through standard suppression measures, such as watering of roads and exposed areas. Impacts on vegetation from dust are expected to be minimal. Emissions from the Project are not expected to have any impact on surrounding vegetation.

Short-term noise impacts from construction of the Project are considered unlikely to cause permanent or temporary damage to the hearing of Western Grasswrens. Existing noise sources include a busy highway (Lincoln Highway and Liberty Steelworks). In a worst-case scenario, masking impacts could occur up to several hundred metres or more from these temporary noise sources. Masking can occur when birds are subject to continuous noise of sufficient intensity in the frequency region of bird hearing that has a detrimental effect on their detection and discrimination of vocal signals (Dooling and Popper 2016). However, given the frequency of the noise and mitigation measures proposed, masking impacts are likely to be considerably less, particularly, given the species is known to occur adjacent busy highways and near some mine sites on the EP. Based on experience at other sites, it is expected Western Grasswrens will still occupy habitat within this zone, but it is possible that breeding-related communication may be temporarily affected. Operational project components are not expected to have any significant noise impacts.

Overall indirect impacts associated with the Action are considered unlikely to significantly impact the species.

4.1.4 Summary of significance assessment

Western Grasswren are known to occur within the Project Area in suitable habitat adjacent the Lincoln Highway and Port Bonython Road. This habitat is located against busy highways and near fenced areas proposed for two solar farms. Whilst the species was detected at several sites (via song meter and observation), the habitat was considered suboptimal in terms of cover, no drainage lines were present and there is Ward's Weed in the understory. The Project Area occurs on the edge of the species range, noting the majority of the highly preferred quality habitat occurs on DoD land (Cultana), well west of the Project Area where there are drainage lines with dense Black Bluebush and spiny shrubs. Over 5,897 ha, of this less suitable habitat occurs within the PSL Area, of which 76 ha (35 suitable, 41 low suitability) will be temporarily disturbed representing 0.03% of the species AOO, and the majority will be rehabilitated. Overall, these temporary negligible impacts are not considered to be ecologically significant to this broad ranging species.

4.2 Southern Whiteface (*Aphelocephala leucopsis*)

The Southern Whiteface is currently listed as Vulnerable under the EPBC Act (with no listing under the NPW Act). The Southern Whiteface is considered known to occur in the PSL Area, particularly in the western end, but is also highly likely in the eastern end of the PSL Area (Table 3.2).

Whilst Southern Whiteface are widespread, their distribution is patchy in woodlands and tall shrublands with grassy / low shrub layers (Menkhorst et al. 2017). They were considered previously common on the edge of dusty country roads with trees nearby, foraging on the ground, preferably where there is less grass cover, feeding on seeds and insects and with nearby trees used for roosting, perching and avoiding predators (e.g. cats). They are considered to be sedentary, occurring in small family groups up to flocks of 20 and often with thornbills (Readers Digest 1977, Menkhorst et al. 2017). Woodlands across the PSL Area are considered to provide the most valuable habitat for this species, in particular mature slow-growing trees which would be considered of higher value given time take to regenerate if cleared.

The species has been detected via song meter and bird surveys in the vicinity of the PSL Area for the NWP (Infrastructure SA 2024). There are also recent BDBSA records within the PSL Area (from 2021 and 2023), east of Lincoln Highway/south of Port Bonython Road adjacent the salt pans, and a number of BDBSA records in the Whyalla Conservation Park (DEW 2024). The species was also detected in the PSL Area as part of spring surveys for the HJP (EBS 2023). Habitat deemed critical for the survival of the species is broadly defined as areas of relatively undisturbed open woodland and shrublands with an understorey of grasses or shrubs, habitat with low tree densities and an herbaceous understorey litter overs which provides essential foraging habitat, and living and dead trees with hollows and crevices which are essential for roosting and nesting (DCCEEW 2022b). Within the Project Area suitable habitat will occur within areas of vegetation mapped as Western Myall Woodland over Chenopod, with or without other tree species such as Black Oak, False Sandalwood and Bullock Bush. Mallee woodlands, which are also floristically diverse will also provide suitable habitat for the species (Figure 4.3).

No important populations of the Southern Whiteface are highlighted in the species Conservation Advice, and the species has no conservation listing in South Australia (DCCEEW 2023b). There are two subspecies of Southern Whiteface; *Aphelocephala leucopsis castaneiventris* (occurs in central and southern Western Australia) and *A. l. leucopsis* (occurs in eastern Western Australia to southern Northern Territory, southern Queensland, all of South Australia and New South Wales, and northern Victoria (Menkhorst et al. 2017, DCCEEW 2023b). The wide-ranging subspecies, with the larger estimated population, relevant to the Project Area is *A. l. leucopsis*. The AOO for the species as a whole is considered to be 7,000,000 ha (DCCEEW 2023b). The assumed AOO for the subspecies within the Gawler IBRA Bioregion is 375,600 ha across an EOO of 15,085,800 ha (ALA 2024). Figure 4.4 shows the species EOO across Australia and regionally.



Figure 4.3: Conservative habitat mapping for Southern Whiteface and records around the PSL Area and Project Area

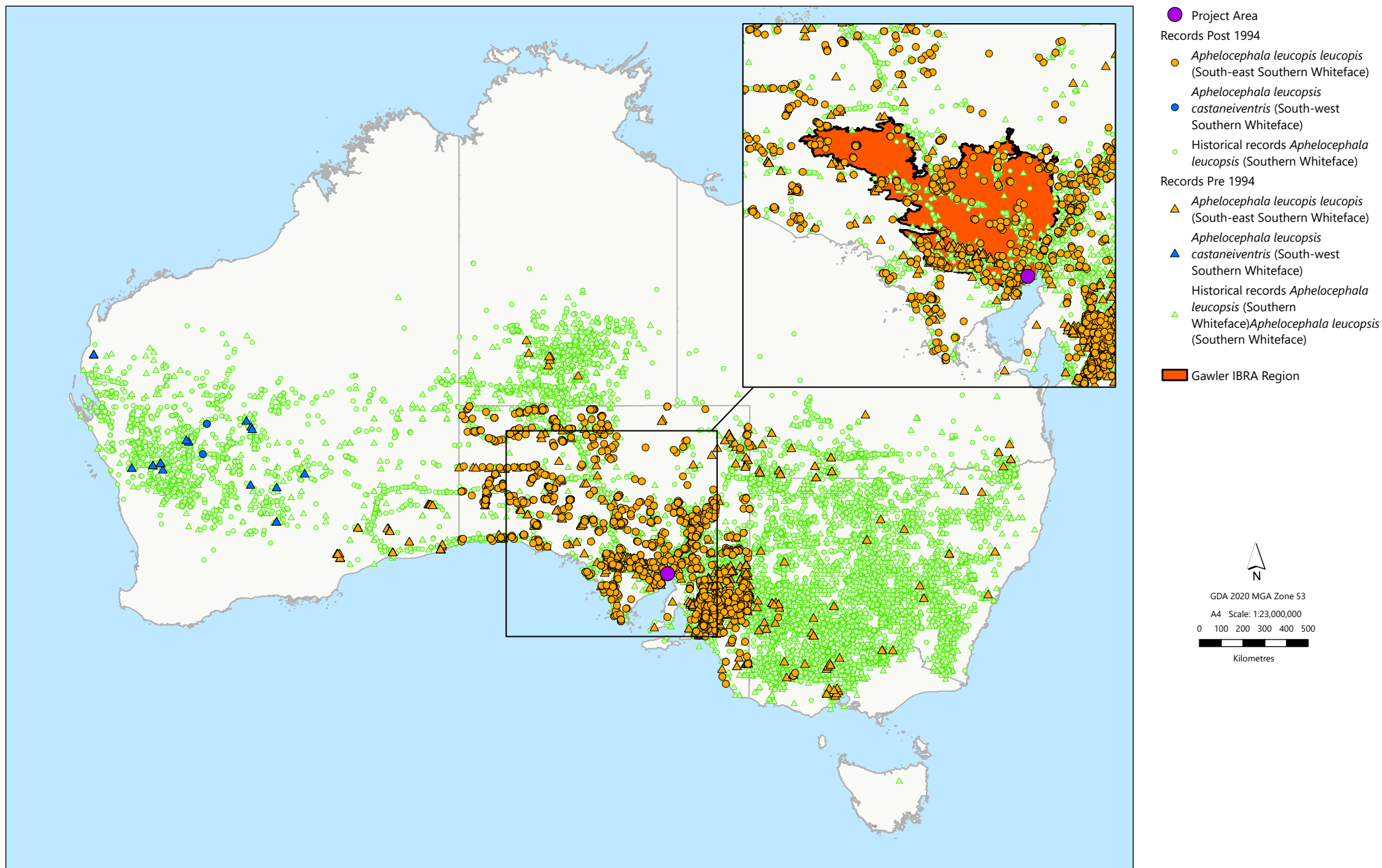


Figure 4.4: Southern Whiteface Extent of Occurrence

4.2.1 Potential impact pathways

Potential impact pathways resulting from construction activities on the Project Area that may affect the Southern Whiteface and/or Southern Whiteface habitat include the following:

- clearance of potential habitat for proposed infrastructure (via vegetation clearance)
- introduction of invasive weed species resulting in habitat degradation
- increase feral animal predation and/or competition.

Direct and indirect impacts are discussed in Section 4.2.3.

4.2.2 Mitigation measures

The identification and implementation of mitigation measures to reduce the incidence and/or impact of construction activities on the Southern Whiteface include the following:

- Avoid any identified areas of low woodland, or higher density and taller shrublands, where practicable (e.g. areas of Western Myall, Black Oak, False Sandalwood, Bullock Bush and Mallee).
- Flag-off any potential preferred habitat identified adjacent to proposed infrastructure areas to ensure no disturbance beyond essential clearance footprint required.
- Undertake pre-construction weed surveys and controls, post-construction weeds surveys and controls, and ongoing weed survey and control during operation.
- Develop and implement clear protocols for management of waste during construction to avoid an increase in, or attraction of, feral pest animals to the Project Area.
- Rehabilitate disturbed areas following completion of the construction activities, noting opportunities to undertake progressive rehabilitation will be identified and implemented. Rehabilitation methodologies, including the respread of vegetation (including tree branches) and topsoil (in the reverse order of clearance) and additional reseeded with selected local species that are suitable for Southern Whiteface will be described in the EIR and CEMP.

4.2.3 Impact assessment

This section provides further assessment of potential residual impacts following mitigation measures, against the significant impact criteria outlined in Table 4.1. As per the summary in Table 3.2, the outcome of the assessment is that **significant impacts are considered unlikely**.

Direct impact

Construction of the Project will require clearing up to 61 ha of suitable habitat for Southern Whiteface as shown in Table 4.2. Highly conservative habitat mapping is provided in Figure 4.1 showing the extent of suitable and low suitable habitat (combined) for the species across the PSL Area. This includes roosting/nesting (habitats that include trees) and potential foraging habitat (habitats that include trees as well as adjacent habitats). Construction areas, that do not form part of the operational footprint, will be revegetated to achieve environmental and other important project outcomes such as amenity and dust control. As is general practice in the arid lands, this will involve ripping where necessary and reinstating stockpiled topsoil and cleared vegetative material to facilitate natural regeneration. Additional reseedling will be undertaken with selected local species that are suitable for Southern Whiteface. Consequently, habitat loss on these areas (approximately 99% of the Disturbance Footprint) are expected to be temporary. It is considered that clearing habitat in a narrow strip adjacent an existing busy highway, would have less impact than clearing a large block, as movement between remaining habitats will still be viable.

Table 4.2: Estimated (worst case) direct impact Southern Whiteface

Habitat Suitability	Construction Temporary Disturbance Footprint (ha)	Existing Disturbance (ha)	Total New Disturbance (ha)	Operational Disturbance Footprint (ha)
Suitable (Western Myall chenopod shrubland +/- Black Oak, Bullock Bush, False Sandalwood)	50.11	16.32	33.79	
Suitable (mallee, mixed shrubland in drainage)	33.40	6.38	27.02	
Low suitable (low open chenopod shrublands +/- emergent trees)	27.34	4.25	23.09	0.16
Total	110.84	26.95	83.89	0.16

As per, Table 4.2, the temporary new clearance of ~ 84 ha of suitable and low suitable habitat within the Project Area, represents a negligible impact on the Area of Occupancy (AOO), and the majority of this will be rehabilitated, these estimates are highly conservative. Given the extremely broad distribution of Southern Whiteface across much of Australia, recent records within the PSL Area and at nearby locations, the Southern Whiteface is considered as known to occur within the Project Area. Whilst this sedentary species has been detected close to Lincoln Highway and may extend along Port Bonython, and potentially into less suitable chenopod habitat closer to Pt. Bonython they have not been detected near Pt. Bonython to date. Disturbance estimates provided above are highly conservative, as is the AOO of 7,000,000 ha (DCCEE 2023b). If the conservative AOO and the conservative direct clearance of up to 84 ha of suitable habitat are applied and the mitigation measures as per Table 3.2 and Section 4.2.3 are implemented, long-term significant impacts to the Southern Whiteface are considered negligible. At most 0.001% of the species habitat within the species National AOO will be temporarily impacted (0.02% of the Gawler IBRA Bioregion AOO), and 0.000002% (0.00004% of Gawler Bioregion) of the species habitat will be

permanently lost (primarily to permanent operational facilities such as the valve station that will not impede the species).

Indirect Impacts

Potential indirect impacts to Southern Whiteface as a result of the Action, include lighting, stormwater/surface flows, dust and emissions and noise, primarily during the construction phase.

Given the pipeline is predominantly underground, lighting will be primarily associated with vehicle and personnel access and security, rather than significant operations. Southern Whiteface are active during dawn till dusk, hence any night-time lighting is not expected to adversely impact the species.

Stormwater management could impact vegetation if runoff is altered. This could benefit the species if preferred chenopod species thrive in such areas. However, the Project occurs in a relatively flat environment, some areas adjacent the major road are already impacted by changes in drainage. Additional changes would be very minor and are not expected to impact Southern Whiteface, assuming standard design protocols are followed and any impact areas are controlled for weeds.

4.2.4 Summary of significance assessment

Southern Whiteface have been recorded within the PSL Area and the broader region including the nearby Whyalla CP, which has similar Western Myall over chenopod vegetation that is present in the PSL Area (DEW 2024). Open woodland including tree species such as Black Oak, False Sandalwood Bullock Bush as well as Mallee habitats within the PSL Area and the broader region will support the species.

The assumed National AOO for the species is conservatively 7,000,000 ha (based on actual records, so potentially much higher given the Extent of Occurrence (EOO) covers 419,000,000 ha across large parts of arid and interior Australia which will be rarely surveyed) (DCCEEW 2023b). At the regional level the Gawler Bioregion AOO is 375,600 ha across an EOO of 15,085,800 ha (ALA 2024). Based on these areas, the temporary new clearance of up to 84 ha of general habitat within the PSL Area represents less than 0.001% (0.02% of Gawler Bioregion) of the reported AOO of the species, and 0.000002% (0.00004% of the Gawler Bioregion) as permanent clearance, hence potential negligible impacts are not considered significant.

Overall, the proposed impacts are not considered to be significant to this broad ranging species.

4.3 Malleefowl (*Leipoa ocellata*)

The Malleefowl is currently listed as Vulnerable under both the EPBC Act, and the NPW Act. The Malleefowl is considered known to occur in the Project Area, particularly in mallee habitat along Port Bonython Road (Table 3.2 and Figure 1.4), where three of the BDBSA records (from 2019) relate to Malleefowl crossing Port Bonython Road and one was feeding near a drainage culvert after crossing (BDBSA 2023). No Malleefowl mounds have been detected in the PSL Area in targeted surveys undertaken to date. Given the lack of deeper sand in the Project Area and proximity to Port Bonython Road, nests are more likely to occur north of Port Bonython Road in the large patch (2870 ha) of Mallee on DoD land, that is contiguous with the Project Area (Figure 4.6). It is noted the mallee in this region is long unburnt (DEW 2024). Approximately 42 ha of mallee and adjacent habitats within the Project Area, including mallee and low woodland transition habitats, were searched in March 2024 (12 dedicated person hours of searching, plus an additional 8 person hours whilst undertaking vegetation assessments) and no evidence of Malleefowl (or mounds) was detected (Lathwida 2024b). Additional slow drive searches were undertaken in August 2024, along with desktop analysis of spatial LiDAR data and verification of potential Malleefowl mounds. No mounds were detected (Lathwida 2024b). The search effort was well above the criteria of the National Malleefowl Monitoring Guidelines (National Malleefowl Recovery Team 2020) and the National Threatened Bird Survey Guidelines (DEWHA 2010, DCCEEW 2024j) (i.e. a minimum of 10 person hours of searching per 50 ha). It was also noted that within the potential disturbance area approximately 27 ha was considered as only suitable foraging habitat for Malleefowl due to presence of stoney ground and very sparse leaf litter.

Malleefowl is wide-ranging in mallee dominant habitats, and associated adjoining habitats such as dense acacia shrublands, *Callitris verrucosa* (Scrub Pine), *Melaleuca uncinata* (Broombush) (for foraging). Deep sandy soils and abundance of leaf litter are required for breeding / nesting (Benshemesh 2007, National Malleefowl Recovery Team 2021, DCCEEW 2024j). Fire history is also important, with the species preferring a mosaic of long unburnt vegetation. Over the course of a year the birds may range over 100 to 300 ha and home-ranges overlap considerably. Densities of birds are greatest in areas of higher rainfall and on more fertile soils where shrub diversity is greatest (Benshemesh 2007, 2021, DCCEEW 2024j). No specific important populations have been defined for the species, with all populations considered equally important (Benshemesh 2007, 2021, DCCEEW 2024j). The AOO for the species is most recently estimated at 5,000,000 ha (Garnet and Baker 2021). The Extent of Occurrence, across Australia, is depicted on Figure 4.5.

In terms of occurrence near human occupation, Malleefowl are known to persist near active mine sites (e.g. SIMEC Mining in South Australia), they can also be observed at a tourist viewing area in the Coorong National Park off Loop Road. Malleefowl monitoring advancements in recent years (using LiDAR and remote sensing cameras) has detected Malleefowl within 4 to 11 m from an active freight train, and on Googs track (Far West Coast) where at least 10 cars pass in close proximity each day. These observations suggest the species can be resilient to noise impacts (B. Backhouse Malleefowl Forum 2021).



Figure 4.5: Conservative habitat mapping for Malleefowl and records around the PSL Area and Project Area

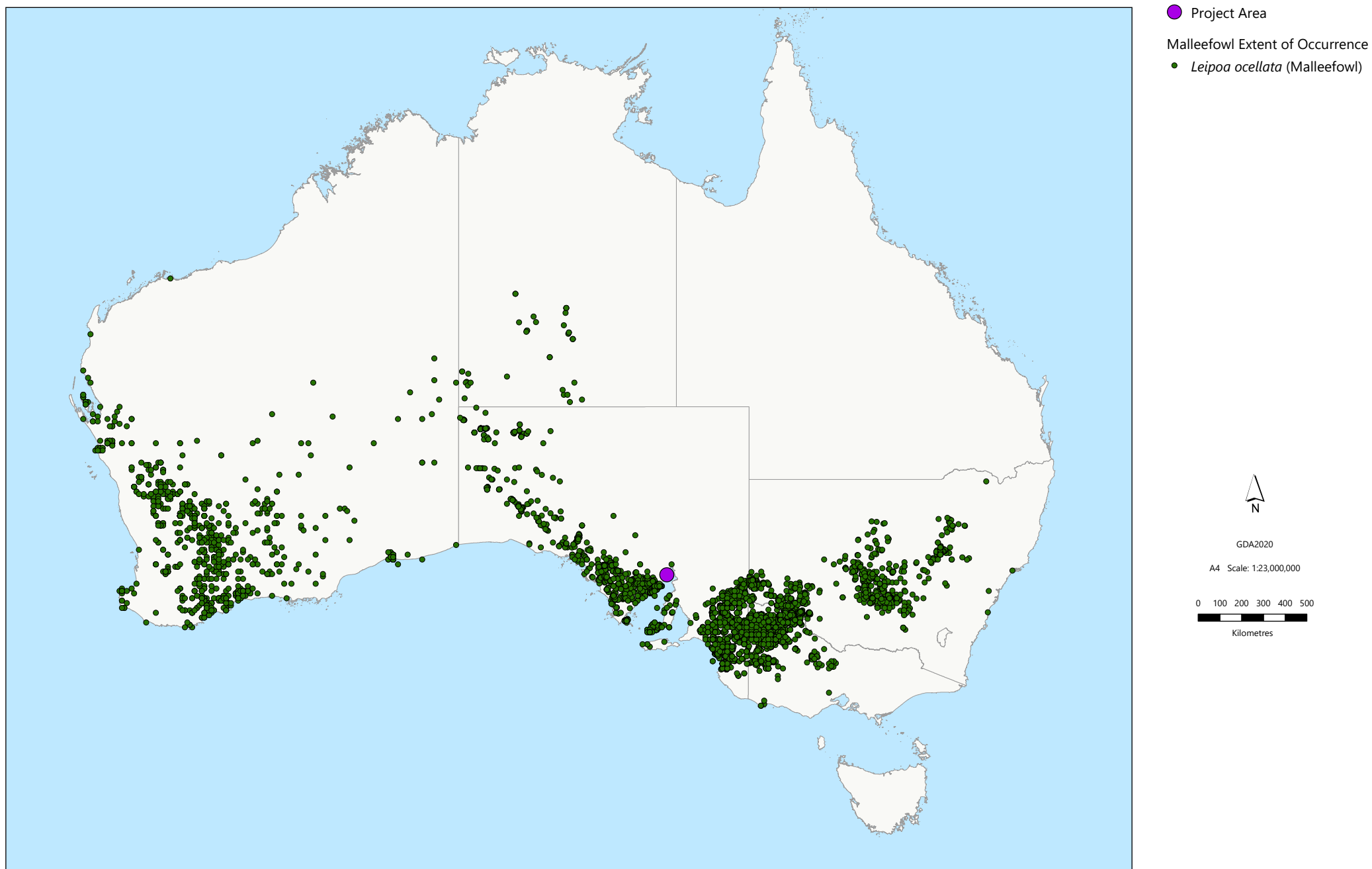


Figure 4.6: Malleefowl Extent of Occurrence

4.3.1 Potential impact pathways

Potential impact pathways resulting from construction activities in the Project Area that may affect the Malleefowl and/or Malleefowl habitat include the following:

- loss of potential general foraging and breeding habitat, with nesting only occurring in areas with deep sand
- injury or mortality from collisions with vehicles, noting higher risk for this species due to ground-dwelling nature and propensity to traverse tracks and roads
- animals falling within open trenches during excavation for the pipeline
- destruction of active or inactive nests if they occur within the footprint and cannot be avoided by linear infrastructure
- introduction of invasive weed species or disease
- increase in pest predator species (e.g. fox and cat).

4.3.2 Mitigation measures

The identification and implementation of mitigation measures to reduce the incidence and/or impact of construction activities on Malleefowl include the following:

- Minimise clearance within mallee, where practicable.
- Undertake preclearance surveys in mallee that cannot be avoided to detect any active or non-active nests, and undertake adaptive mitigation to avoid impacts to Malleefowl, if required (e.g. establish no go areas, relocate live Malleefowl or eggs in collaboration with DEW staff and in accordance with the *National Parks and Wildlife Act 1972* (SA), as required).
- Undertake pre-construction weed surveys and controls, post-construction weed surveys and controls, and ongoing weed survey and control during operation.
- Undertake daily inspection of open trenches during working cycle with any fauna handling or removal to be undertaken in accordance with the *National Parks and Wildlife Act 1972* (SA).
- Minimise (as far as practicable) the amount of time the trench or bore hole is open.
- Develop and implement clear protocols for management of waste during construction to avoid an increase in, or attraction of, feral pest animals to the Project Area.
- Minimise disturbance to mallee vegetation wherever possible.
- Trenches are progressively backfilled as the pipeline is constructed.
- Rehabilitate temporary disturbed areas following construction activities (e.g. within 3 to 6 months), use of progressive rehabilitation will be identified and implemented, as feasible. Rehabilitation methodologies, including the respread of vegetation (including tree branches/stumps) and topsoil (in the reverse order of clearance) and additional reseeding with selected local species that are suitable for Malleefowl will be described in the Project CEMP.

4.3.3 Impact assessment

This section provides an assessment of potential residual impacts following mitigation measures, against the significant impact criteria outlined in Table 2.4. As per the summary in Table 3.2, the outcome of the assessment is that **significant impacts are considered unlikely**.

Direct impact

Construction of the Project will require clearing of up to 28 ha of suitable Malleefowl habitat (primarily foraging) as shown in Table 4.3. Highly conservative habitat mapping is provided in Figure 4.1 showing the extent of suitable habitat for the species across the PSL Area. Some of this mallee includes transition vegetation such as mallee with low woodlands of False Sandalwood, Bullock Bush, and sclerophyll shrubs, and tall coastal shrubland on low dunes that would be suitable for Malleefowl foraging. Construction areas, that do not form part of the operational footprint, will be rehabilitated to achieve environmental and other important project outcomes such as amenity and dust control. As is general practice in the arid lands, this will involve ripping where necessary and reinstating stockpiled topsoil and vegetative material in the reverse order of clearance to facilitate natural regeneration. Additional reseedling will be undertaken with selected local species that are suitable for Malleefowl. Consequently, habitat loss on these areas (approximately 99% of the Disturbance Footprint) are expected to be temporary, however it is noted that mallee species are slow growing. Rehabilitation would likely include a diverse range of colonising mallee species and the corridor would continue to provide suitable foraging habitat for Malleefowl in the short-term and longer term.

Table 4.3: Estimated (worst case) direct impact Malleefowl

Habitat Suitability	Construction Temporary Disturbance Footprint (ha)	Existing Disturbance (ha)	Total New Disturbance (ha)	Operational Disturbance Footprint (ha)
Suitable (mallee), primarily foraging	31.65	6.07	25.58	
Coastal tall shrubland, primarily foraging	0.85	0.41	0.44	
Mixed shrublands in ephemeral drainage lines	1.75	0.31	1.44	
Unsuitable suitable (Chenopod / samphire shrublands)				0.16
Total	34.25	6.79	27.46	0.16

As per, Table 4.3, temporary clearance of approximately 28 ha of mallee and adjacent habitat next to a fenceline with existing tracks represents a negligible impact on the AOO of the species, and the majority of the 28 ha of this will be rehabilitated. Given the extremely broad distribution of Malleefowl across much of Australia, limited recent records within the PSL Area and at nearby locations, the Malleefowl is

considered as known to occur within mallee habitats that occur within the Project Area. North of the Project Area, and outside of the PSL Area, mallee habitat is extensive within DoD land. This species has been detected close to Port Bonython Road, and may utilise nearby mallee habitat primarily for foraging and where deeper sands occur, nesting may also occur. Disturbance estimates provided above are highly conservative, as is the AOO of 5,000,000 ha (Garnet and Baker 2021). Using the conservative AOO and the conservative direct temporary clearance of up to 28 ha of suitable habitat, and assuming implementation of the mitigation measures as per Table 3.2 and Section 3, long-term significant impacts to the Malleefowl are considered negligible. At most 0.001% of the species habitat within the AOO will be temporarily impacted, and 0.001% of the species habitat will be rehabilitated. It is noted that in the short-term a diversity of colonising mallee species would continue to be suitable foraging habitat for the Malleefowl that often use a mosaic of dense mallee to burnt mallee and adjacent habitats for foraging. In the longer-term mallee species will return to the area. It is also noted that the mallee that will be disturbed is adjacent a noisy road with existing traffic heading to and returning from Port Bonython. The remaining mallee is contiguous with a large tract (2,870 ha) of mallee on the DoD land. Less than 1% of this large tract of mallee will be temporarily cleared adjacent an existing busy road, hence any local Malleefowl have a vast area of contiguous habitat to move in to, and this available habitat is further away from the road.

Indirect Impacts

Potential indirect impacts to Malleefowl as a result of the Action, include lighting, stormwater/surface flows, dust and emissions and noise, primarily during the construction phase.

Given the pipeline is predominantly underground, lighting will be primarily associated with vehicle and personnel access and security, rather than significant operations. Malleefowl are active during dawn till dusk, hence night-time lighting is not expected to adversely impact the species.

Noise impacts are considered unlikely to impact Malleefowl, given they are known to persist in the region adjacent a busy road. There are records of the species crossing Port Bonython Road and foraging in drainage areas near the road (BDBSA 2023). In addition, Malleefowl are known to persist near active mine sites (e.g. SIMEC Mining in South Australia), they can also be observed at a tourist viewing area in the Coorong National Park off Loop Road. Malleefowl monitoring advancements in recent years (using Lidar and remote sensing cameras) has detected Malleefowl within 4-11m from an active freight train, and on Googs track (Far West Coast) where at least 10 cars pass in close proximity each day. These observations suggest the species can be resilient to noise impacts (B. Backhouse Malleefowl Forum 2021). Regardless, given the mobility and wide-ranging nature of the species (e.g. home range 100 - 300ha), it is likely any individual present in the Project Area would move away from the area during construction and return when noise has ceased.

Stormwater management could impact vegetation if runoff is altered. This could benefit the species if preferred mallee species thrive in such areas. However, the Project occurs in a relatively flat environment, some areas adjacent the major road are already impacted by changes in drainage. Additional changes would be very minor and are not expected to impact Malleefowl, assuming standard design protocols are followed and any impact areas are controlled for weeds.

4.3.4 Summary of significance assessment

Malleefowl have been recorded within the PSL Area along Port Bonython Road in line with mallee vegetation that occurs in a strip on the southern side of the road and connects to vast areas of mallee vegetation on DoD land to the north of Port Bonython Road. There are some existing access tracks on both sides of Port Bonython Road and existing disturbed areas will be used where possible, aligning with suitable safety and geotechnical considerations for a buried pipeline. The approximate amount of mallee vegetation in the PSL Area is 564 ha, and this is contiguous with 2,870 ha of mallee on DoD land, conservatively a maximum of 28 ha is required to be temporarily cleared for construction of the Project, and the majority of this will be rehabilitated, providing suitable foraging habitat in the earlier years.

Based on an AOO of the species of 5,000,000 ha (Garnet and Baker 2021), the temporary clearance of up to 28 ha of general foraging habitat within the PSL Area represents less than 0.001% of the reported AOO of the species, and the majority of this will be rehabilitated, hence potential impacts are considered to be negligible and not considered likely to result in significant impacts to the species. Noting that areas of mallee that are cleared will primarily involve rehabilitation of all shrub and understory species in the short-term, given the time it takes for mallee itself to regenerate, but these areas will still be suitable for Malleefowl foraging, given the preference for a mosaic of long unburnt / burnt habitats with a diversity of floristic species.

Overall, the proposed impacts are not considered to be significant to this broad ranging species.

5 Additional Ecological MNES

Additional MNES have been assessed and have been deemed as either not relevant or having no potential impact due to excessively large distances from the Project.

Distances of the Project footprint to other MNES and a description are presented in Table 5.1.

Table 5.1: Hydrogen Jobs Plan Pipeline Project distance to other MNES

MNES	Distance to the Project (km)	Description
Ramsar Wetlands of international importance	>5	The PMST did not highlight any Ramsar Wetlands in the vicinity of the PSL Area. No project-related impacts to this MNES are expected.
Commonwealth marine areas	>5	The PMST did not highlight any Commonwealth Marine Areas. The Project does not interact with the marine environment in any way and there is no potential for impacts to this MNES.
World heritage areas	>5	No World Heritage Properties were highlighted by the PMST. It is considered that there is no potential impact to this MNES.
National heritage places	>500 m	<p>The PMST highlighted the nearest National Heritage Place as the Cuttlefish Coast Sanctuary Zone. This zone is part of the Upper Spencer Gulf Marine Park. The closest location of this National Heritage Place is ~ 2 km from the Project Area, on the southern side of Port Bonython Road.</p> <p>The Project will have no direct impacts on the marine environment. Indirect impacts (e.g. sedimentation) are also not likely to occur. The Project Area is not close to the coastline and is buffered by Port Bonython Road and numerous other unformed roads and tracks. It crosses one minor ephemeral drainage line (approximately 1.5 km from the coast) that flows to the marine environment, to the west of the National Heritage Place. Control measures will be in place during construction to prevent any significant erosion or sedimentation in drainage lines as a result of the Project (noting also that drainage lines in this area are likely to flow very infrequently and carry naturally high sediment loads).</p> <p>Due to the distance between the Project and the nearest National Heritage Place (and the absence of significant drainage connections and the control measures that will be in place) it is considered that there is no potential for impact to this MNES.</p>
Great Barrier Reef Marine Park	>5	The PMST did not highlight the Great Barrier Reef Marine Park as occurring within 5 km of the PSL Area. As a result of the distance between the Project and the Great Barrier Reef Marine Park, it is considered that there is no potential impact to this MNES.
Water resources that relate to coal seam gas development and large coal mining development	NA	The Project is not directly or indirectly associated with a coal seam gas development or large coal mining development. Therefore, it is considered the Project does not trigger the MNES and thus do not require an assessment of the potential for significant impacts to the whole of the environment.

6 Summary

The assessment of the Project against all relevant MNES considered that only Threatened Species have the potential to occur within the Project Area. Migratory Species, and one TEC (listed as Vulnerable, Subtropical Temperate Coastal Saltmarsh) have potential to occur adjacent to the Project Area and other non-ecological MNES are not present or in proximity to the PSL Area. A summary is presented in Table 5.1.

Migratory species are considered unlikely to be reliant on habitat available within the Project Area, but have potential to occur in areas adjacent / nearby the broader PSL Area, and are not likely to use or be reliant on habitats which will be disturbed by the construction activities.

Of the 41 MNES species highlighted as potentially relevant to the PSL Area in the PMST output, three threatened species are considered known to occur in the Project Area and habitat / individuals of the species have potential to occur within the Project Area. The three species are: Western Grasswren (*Amytornis textilis myall*), Southern Whiteface (*Aphelocephala leucopsis*) and Malleefowl (*Leipoa ocellata*), all listed as Vulnerable under the EPBC Act. The significant impact assessment presented here, with specific focus on these three key species, has demonstrated that the proposed constructions activities (primarily temporary clearance for a buried pipeline) as described within this assessment are unlikely to have a significant impact on any of the MNES. Where mitigation strategies are implemented, such as avoiding critical habitat, potential impacts are further reduced.

Table 6.1: Significant impact assessment summary

MNES	Assessment Outcome	Significant Impact to MNES?
Threatened ecological communities	The Project does not interact with any threatened ecological communities. Saltmarsh areas south and southeast of the PSL Area are that may meet the criteria for the Vulnerable TEC (which is not an MNES) avoided by the project. A small area of samphire that will be cleared (~2 ha) is stranded and distant from tidally connect areas and does not meet TEC criteria.	No
Listed threatened species	<p>All threatened species which are considered likely to occur, or to potentially occur, in the Project Area do not have notable areas of potential or preferred habitat within the Disturbance Footprint of the Project Area, with the exception of:</p> <ul style="list-style-type: none"> Western Grasswren. The species has been confirmed as present within the PSL Area. Suitable habitat occurs within the Project Area and disturbance area. This habitat is not considered critical to the survival of the species, but supports the individuals on the edge of the species range. No preferred habitat occurs within the Project Area or Disturbance Footprint; i.e. drainage lines with dense Black Bush and Australian Boxthorn. Route selection has avoided as much of the species habitat as possible, including areas with tree species (e.g. Western Myall, Black Oak, False Sandalwood, Bullock Bush). Up to 99% of the vegetation that will be cleared includes Chenopod shrublands that will be rehabilitated following temporary clearance for the buried storage pipeline. The temporary new clearance represents 0.03% of the species AOO and permanent clearance (0.16 ha) represents 0.00002% of the species AOO. Southern Whiteface. The species has been confirmed as present within the PSL Area. Some habitat which is documented in the conservation advice (DCCEEW 2023b) as critical to the survival of the species has been documented within the Project Area. Whilst temporary clearance of 67 ha of suitable habitat will occur during construction activities, up to 99% of this habitat would be rehabilitated following construction of the buried pipeline and therefore the proposed impacts are not considered to be ecologically significant to this broad ranging species. The temporary clearance represents 0.001% of the species National AOO, 0.02% of the Gawler Bioregion AOO and permanent clearance (0.16 ha) represents 0.000002% of the species National AOO and 0.00004% of the species Gawler Bioregion AOO. Malleefowl. The species has been confirmed as present within mallee habitat that occurs within the PSL Area. This habitat runs either side of a major road (Port Bonython Road) and is contiguous with vast areas of intact mallee (>2870 ha) on DoD land. Mallee within the Project Area is more suitable for foraging than nesting, but mitigation measures would mitigate any impacts to the species. Temporary clearance of 28 ha of suitable foraging habitat (mallee and tall shrubland), that would be rehabilitated (99%) is considered negligible to this wide ranging species. The temporary clearance represents 0.001% of the species AOO and permanent clearance (0.16 ha) represents 0.000003% of the species AOO. Noting that the permanent clearance is proposed for chenopod shrubland rather than mallee. 	Not likely
Migratory species protected under international agreements	Non-breeding migrants have potential to occur adjacent Project Area following substantial rain events and when migrating inland. The PSL Area itself is not considered important habitat for these species, but it is noted that the adjacent Whyalla Saltfields and False Bay Beaches are visited by migratory species. These areas are avoided by the Project	Not likely
Ramsar wetlands of international importance	Project Area is not in proximity to Ramsar wetlands	No
Commonwealth marine areas	Project Area is not in proximity to Commonwealth marine areas	No
World heritage properties	Project Area is not in proximity to World Heritage properties	No
National heritage places	The nearest National Heritage Place as the Cuttlefish Coast Sanctuary Zone. This zone is part of the Upper Spencer Gulf Marine Park. The closest location of this National Heritage Place is over 2 km from the Project Area, on the southern side of Port Bonython Road. The Project will have no direct impacts on the marine environment. Indirect impacts (e.g. sedimentation) are also not likely to occur. The Project Area is not close to the coastline and is buffered by Port Bonython Road and numerous other unformed roads and tracks.	No
The Great Barrier Reef Marine Park	Project Area is not in proximity to the Great Barrier Reef Marine Park	No
A water resource in relation to coal seam gas or large coal mining development.	The Action is not coal seam gas or coal	No

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APPENDICES

Appendix A. Protected Matters Search Tool Report



Australian Government

Department of Climate Change, Energy,
the Environment and Water

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: 31-Jan-2024

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[Extra Information](#)

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[Acknowledgements](#)

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:	None
Listed Threatened Ecological Communities:	1
Listed Threatened Species:	50
Listed Migratory Species:	45

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:	11
Commonwealth Heritage Places:	None
Listed Marine Species:	81
Whales and Other Cetaceans:	8
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:	3
Regional Forest Agreements:	None
Nationally Important Wetlands:	1
EPBC Act Referrals:	12
Key Ecological Features (Marine):	None
Biologically Important Areas:	3
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
Natural			
Cuttlefish Coast Sanctuary Zone	SA	Listed place	In feature area

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
Subtropical and Temperate Coastal Saltmarsh	Vulnerable	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			
Amytornis textilis myall			
Western Grasswren (Gawler Ranges) [64454]	Vulnerable	Species or species habitat known to occur within area	In feature area
Aphelocephala leucopsis			
Southern Whiteface [529]	Vulnerable	Species or species habitat known to occur within area	In feature area
Ardenna grisea			
Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area	In feature area
Arenaria interpres			
Ruddy Turnstone [872]	Vulnerable	Species or species habitat known to occur within area	In feature area
Calidris acuminata			
Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Calidris tenuirostris Great Knot [862]	Vulnerable	Species or species habitat known to occur within area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	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	Species or species habitat may 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
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat known to occur within area	In feature area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat may occur within area	In feature area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat may occur within area	In feature area
Leipoa ocellata Malleefowl [934]	Vulnerable	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Limosa lapponica baueri Nunivak Bar-tailed Godwit, Western Alaskan Bar-tailed Godwit [86380]	Endangered	Species or species habitat may occur within area	In feature area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may 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
Melanodryas cucullata cucullata South-eastern Hooded Robin, Hooded Robin (south-eastern) [67093]	Endangered	Species or species habitat may occur within area	In buffer area only
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat known to occur within area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	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
Pedionomus torquatus Plains-wanderer [906]	Critically Endangered	Species or species habitat may occur within area	In feature area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area	In feature area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area	In feature area
Stagonopleura guttata Diamond Firetail [59398]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Species or species habitat known 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 impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may 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 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
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area	In feature area
FISH			
Seriolella brama Blue Warehou [69374]	Conservation Dependent	Species or species habitat likely 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			

Scientific Name	Threatened Category	Presence Text	Buffer Status
Eubalaena australis Southern Right Whale [40]	Endangered	Breeding known to occur within area	In feature area
Neophoca cinerea Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat may occur within area	In feature area
Sminthopsis psammophila Sandhill Dunnart [291]	Endangered	Species or species habitat likely to occur within area	In feature area
PLANT			
Caladenia tensa Greencomb Spider-orchid, Rigid Spider-orchid [24390]	Endangered	Species or species habitat may occur within area	In feature area
Frankenia plicata [4225]	Endangered	Species or species habitat may occur within area	In feature area
Pterostylis xerophila Desert Greenhood [7997]	Vulnerable	Species or species habitat may occur within area	In feature area
Swainsona pyrophila Yellow Swainson-pea [56344]	Vulnerable	Species or species habitat may occur within area	In feature area
REPTILE			
Aprasia pseudopulchella Flinders Ranges Worm-lizard [1666]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area	In feature area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area	In feature area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area	In feature area
SHARK			

Scientific Name	Threatened Category	Presence Text	Buffer Status
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 buffer area only

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]	Vulnerable	Species or species habitat may 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	Species or species habitat may 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
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may 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 may 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 impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may 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 steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
Migratory Marine Species			
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area	In feature area
Caperea marginata Pygmy Right Whale [39]		Species or species habitat 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
Caretta caretta Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area	In feature area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area	In feature area
Eubalaena australis as Balaena glacialis australis Southern Right Whale [40]	Endangered	Breeding 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 may occur within area	In feature area
Migratory Terrestrial Species			
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area	In feature area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area	In feature area
Migratory Wetlands Species			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area
Arenaria interpres Ruddy Turnstone [872]	Vulnerable	Species or species habitat known to occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris alba Sanderling [875]		Species or species habitat likely to occur within area	In feature area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area	In feature area
Calidris ruficollis Red-necked Stint [860]		Species or species habitat known to occur within area	In feature area
Calidris tenuirostris Great Knot [862]	Vulnerable	Species or species habitat known to occur within area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Charadrius veredus Oriental Plover, Oriental Dotterel [882]		Species or species habitat may occur within area	In feature area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat may occur within area	In feature area
Gallinago stenura Pin-tailed Snipe [841]		Species or species habitat known to occur within area	In feature area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area	In buffer area only
Philomachus pugnax Ruff (Reeve) [850]		Species or species habitat known to occur within area	In feature area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area	In feature area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Species or species habitat known to occur within area	In feature area

Other Matters Protected by the EPBC Act

Commonwealth Lands

[[Resource Information](#)]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Commonwealth Land Name	State	Buffer Status
Defence		
Defence - AIRTC WHYALLA [40170]	SA	In buffer area only
Defence - CULTANA TRAINING AREA [40106]	SA	In feature area
Defence - CULTANA TRAINING AREA [40103]	SA	In buffer area only
Defence - CULTANA TRAINING AREA [40104]	SA	In buffer area only
Defence - EL ALAMEIN - PORT AUGUSTA [40105]	SA	In buffer area only
Defence - WHYALLA TRAINING DEPOT [40171]	SA	In buffer area only
Defence - WHYALLA TRAINING DEPOT [40172]	SA	In buffer area only

Transport and Regional Services - Australian National Railways Commission		
Commonwealth Land - Australian National Railways Commission [41425]	SA	In buffer area only
Commonwealth Land - Australian National Railways Commission [41565]	SA	In feature area

Commonwealth Land Name		State	Buffer Status
Commonwealth Land - Australian National Railways Commission [40934]		SA	In feature area
Unknown			
Commonwealth Land - [40927]		SA	In buffer area only
Listed Marine Species		[Resource Information]	
Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to 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]	Vulnerable	Species or species habitat may occur within area	In feature area
Arenaria interpres Ruddy Turnstone [872]	Vulnerable	Species or species habitat known 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]	Vulnerable	Species or species habitat known to occur within area	In feature area
Calidris alba Sanderling [875]		Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area overfly marine area	In feature area
Calidris ruficollis Red-necked Stint [860]		Species or species habitat known to occur within area overfly marine area	In feature area
Calidris tenuirostris Great Knot [862]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area
Chalcites osculans as Chrysococcyx osculans Black-eared Cuckoo [83425]		Species or species habitat known to occur within area overfly marine area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Charadrius ruficapillus Red-capped Plover [881]		Species or species habitat known to occur within area overfly marine area	In feature area
Charadrius veredus Oriental Plover, Oriental Dotterel [882]		Species or species habitat may occur within area overfly marine area	In feature area

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 epomophora Southern Royal Albatross [89221]	Vulnerable	Species or species habitat may 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
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat may occur within area overfly marine area	In feature area
Gallinago stenura Pin-tailed Snipe [841]		Species or species habitat known to occur within area overfly marine area	In feature area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area	In feature area
Himantopus himantopus Pied Stilt, Black-winged Stilt [870]		Species or species habitat known to occur within area overfly marine area	In feature area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In feature area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may 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
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area overfly marine area	In feature area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may 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
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Onychoprion fuscatus as Sterna fuscata Sooty Tern [90682]		Breeding known to occur within area	In feature area
Pachyptila turtur Fairy Prion [1066]		Species or species habitat likely to occur within area	In feature area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area	In buffer area only
Phalacrocorax fuscescens Black-faced Cormorant [59660]		Foraging, feeding or related behaviour likely to occur within area	In feature area
Philomachus pugnax Ruff (Reeve) [850]		Species or species habitat known to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area	In feature area
Recurvirostra novaehollandiae Red-necked Avocet [871]		Species or species habitat known to occur within area overfly marine area	In feature area
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area overfly marine area	In feature area
Sterna striata White-fronted Tern [799]		Migration route may occur within area	In feature area
Sternula nereis as Sterna nereis Fairy Tern [82949]		Breeding known 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 impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may 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 steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
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
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
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Species or species habitat known to occur within area overfly marine area	In feature area
Fish			
Acentronura australe Southern Pygmy Pipehorse [66185]		Species or species habitat may occur within area	In feature area
Filicampus tigris Tiger Pipefish [66217]		Species or species habitat may occur within area	In feature area
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 breviceps Short-head Seahorse, Short-snouted Seahorse [66235]		Species or species habitat may occur within area	In feature area
Histiogamphelus cristatus Rhino Pipefish, Macleay's Crested Pipefish, Ring-back Pipefish [66243]		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

Scientific Name	Threatened Category	Presence Text	Buffer Status
Kaupus costatus Deepbody Pipefish, Deep-bodied Pipefish [66246]		Species or species habitat may occur within area	In feature area
Leptoichthys fistularius Brushtail Pipefish [66248]		Species or species habitat may occur within area	In feature area
Lissocampus caudalis Australian Smooth Pipefish, Smooth Pipefish [66249]		Species or species habitat may occur within area	In feature area
Lissocampus runa Javelin Pipefish [66251]		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
Notiocampus ruber Red Pipefish [66265]		Species or species habitat may occur within area	In feature area
Phycodurus eques Leafy Seadragon [66267]		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
Stigmatopora argus Spotted Pipefish, Gulf Pipefish, Peacock Pipefish [66276]		Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Stigmatopora nigra Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area	In feature area
Stipecampus cristatus Ringback Pipefish, Ring-backed Pipefish [66278]		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 margaritifer Mother-of-pearl Pipefish [66283]		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
Vanacampus vercoi Verco's Pipefish [66286]		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
Neophoca cinerea Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat may occur within area	In feature area
Reptile			
Caretta caretta Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area	In feature area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area	In feature area

Whales and Other Cetaceans		[Resource Information]	
Current Scientific Name	Status	Type of Presence	Buffer Status
Mammal			
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area	In feature area
Caperea marginata Pygmy Right Whale [39]		Species or species habitat 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	Breeding known to 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 may occur within area	In feature area
Tursiops aduncus Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area	In feature area
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
Unnamed (No.HA1588)	Heritage Agreement	SA	In feature area
Upper Spencer Gulf	Marine Park	SA	In feature area
Whyalla	Conservation Park	SA	In feature area

Nationally Important Wetlands		[Resource Information]
Wetland Name	State	Buffer Status
Upper Spencer Gulf	SA	In feature area

EPBC Act Referrals				[Resource Information]
Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Cultana Solar Farm project	2023/09658		Referral Decision	In feature area

Controlled action				
Arafura Whyalla Rare Earths Complex	2011/5877	Controlled Action	Completed	In feature area
Construction and operation of a coal storage facility	2001/463	Controlled Action	Completed	In feature area
Expansion of the Cultana Training Area	2010/5316	Controlled Action	Post-Approval	In feature area
Expansion of the Olympic Dam copper, uranium, gold and silver mine, processing plant and associated	2005/2270	Controlled Action	Post-Approval	In feature area
Pig Iron Smelter	2001/473	Controlled Action	Completed	In feature area
Pig Iron Smelter (Cultana)	2001/466	Controlled Action	Completed	In feature area
Port Bonython Bulk Commodities Export Facility, SA	2012/6336	Controlled Action	Final PD	In feature area
Not controlled action				
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area
Pilot desalination plant, Olympic Dam Expansion Project	2007/3391	Not Controlled Action	Completed	In feature area
Project Magnet	2004/1724	Not Controlled Action	Completed	In feature area

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action				
Whyalla Solar Farm Project, SA	2017/7910	Not Controlled Action	Completed	In feature area

Biologically Important Areas			
Scientific Name	Behaviour	Presence	Buffer Status
Seabirds			
Ardena tenuirostris Short-tailed Shearwater [82652]	Foraging (in high numbers)	Likely to occur	In feature area
Phalacrocorax fuscescens Black-faced Cormorant [59660]	Foraging	Known to occur	In feature area
Sternula nereis Fairy Tern [82949]	Foraging	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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Attachment D Draft Threatened Species Management Plan



Threatened Species Management Plan EPBC 2024/09873

Whyalla Hydrogen Pipeline

Epic Energy South Australia Pty Ltd (ACN 54 068 599 815)

JBS&G 65970 | Document 164,040





We acknowledge the Traditional Custodians of Country throughout Australia and their connections to land, sea and community.

We pay respect to Elders past and present and in the spirit of reconciliation, we commit to working together for our shared future.

Caring for Country The Journey of JBS&G
Artist: Patrick Caruso, Eastern Arrernte



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Glossary and abbreviation of terms

Term	Definition
BDBSA	Biological Databases of South Australia
CEMP	Construction Environmental Management Plan
CFS	South Australian Country Fire Service
CP	Conservation Park
DCCEEW	Department of Climate Change, Energy, the Environment and Water (Commonwealth)
DEW	Department for Environment and Water (South Australia)
Disturbance Footprint	The indicative Disturbance Footprint (temporary disturbance for pipeline and permanent disturbance for compressor and valve stations) as shown in Figure 5-1
DotE	Department of the Environment (Commonwealth)
EBS	Environmental and Biodiversity Services Pty Ltd, trading as EBS Ecology
EMP	Environmental Management Plan
EPA	Environmental Protection Authority
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999
EMS	Environmental Management System
ha	Hectare(s)
HJP	Hydrogen Jobs Plan
IUCN	International Union for Conservation of Nature
km	Kilometre(s)
MLV	Mainline valve
MNES	Matter(s) of National Environmental Significance, as defined under the EPBC Act.
OEMP	Operational Environmental Management Plan
OHPSA	Office of Hydrogen Power South Australia
Project	The planning and development of a hydrogen pipeline, compressor station and valve station, also referred to as the Whyalla Hydrogen Pipeline
Project area	The 1,509 ha area delineated in Figure 5-1
SA	South Australia/South Australian
sp.	Species (singular)
spp.	Species (plural)
ssp.	Subspecies
SPRAT	Species Profile and Threats Database
Subject Threatened Species	Western Grasswren (<i>Amytornis textilis myall</i>), Southern Whiteface (<i>Aphelocephala leucopsis</i>) and Malleefowl (<i>Leipoa ocellata</i>)
the Proposed Action	Epic Energy's approximately 45 km underground hydrogen pipeline, compressor and valve station (referred to below as the WHP or Project)
TSMP	Threatened Species Management Plan
V	Vulnerable

Declarations

Declaration of accuracy

In making this declaration, I am aware that section 491 of the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act) makes it an offence in certain circumstances to knowingly provide false or misleading information or documents to specified persons who are known to be performing a duty or carrying out a function under the EPBC Act or the Environment Protection and Biodiversity Conservation Regulation 2000 (Cth). The offence is punishable on conviction by imprisonment or a fine, or both.

I am authorised to bind the approval holder to this declaration and that I have no knowledge of that authorisation being revoked at the time of making this decision.

Signed	
Full name (please print)	
Organisation (please print)	Epic Energy
Role (please print)	
Date	
Proponent /approval holder and ACN or ABN	54 068 599 815
EPBC Referral Number:	2024/09873
Project Name:	Whyalla Hydrogen Pipeline
Document name	Threatened Species Management Plan
Location of the action	Whyalla

1. Introduction

Epic Energy South Australia Pty Ltd (Epic Energy) plans to construct and operate (and eventually decommission) the Whyalla Hydrogen Pipeline (WHP or the Project). The WHP is an underground pipeline and associated infrastructure (including compression facilities) for storage and transportation of hydrogen and direct supply connection servicing the Whyalla Hydrogen Facility. The Whyalla Hydrogen Facility is proposed to be constructed separately and operated by, or on behalf of, the South Australian Government as part of the Hydrogen Jobs Plan (described further in Section 5).

Hydrogen produced by the Whyalla Hydrogen Facility's electrolyzers would be compressed, injected into, stored under pressure and transported through the WHP. This stored hydrogen would be used to feed the hydrogen power station at the Whyalla Hydrogen Facility at times when the power station is delivering dispatchable power into the energy grid. Excess hydrogen produced at the HJP site would be stored in the WHP and used to generate dispatchable power into the grid when required.

Several ecological constraints associated with the WHP were identified during surveys conducted for the Project, including potential impacts to the Western Grasswren (*Amytornis textilis myall*), Southern Whiteface (*Aphelocephala leucopsis*) and Malleefowl (*Leipoa ocellata*) (**Subject Threatened Species**). These species are all listed as Vulnerable under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and have historical and recent observations and suitable habitat within and surrounding the Project area. No other listed threatened species under the EPBC Act or other matters of national environmental significance were identified as likely to be impacted by the WHP.

Epic Energy lodged a referral under the EPBC Act for the Proposed Action (EPBC Ref: 2024/09873) to the Department of Climate Change, Energy, the Environment and Water (DCCEEW). On 1 July 2024, the referral was determined to be a controlled action to be assessed on preliminary documentation.

1.1 Scope of this document

This Threatened Species Management Plan (the Plan) sets out the proposed management measures that will be implemented to avoid, minimise and/or mitigate potential impacts of the WHP on the Subject Threatened Species during pre-construction, construction, operation/maintenance and decommissioning.

1.1.1 Objectives

The objectives of this Threatened Species Management Plan are to:

- Summarise the likely direct and potential indirect impacts to the Subject Threatened Species during pre-construction/planning, construction, operation and decommissioning of the WHP
- Provide a risk assessment and management measures to minimise impacts to the Subject Threatened Species and their habitat during pre-construction/planning, construction, operation and decommissioning phases of the Project.
- Set out the environmental outcomes and performance measures that will be met during pre-construction/planning, construction, operation and decommissioning phases of the Project.
- Describe how the effectiveness of the environmental management measures will be monitored and reported.
- Outline the procedures for taking corrective action if monitoring identifies that the environmental outcomes and/or performance measures in the plan have not been, or may not be, met.
- Define roles and responsibilities for the actions in this plan.
- Ensure relevant approval conditions for the WHP under the EPBC Act are met.

1.1.2 Acknowledgement

This document draws from the Threatened Species Management Plan prepared by Dr M Louter (EBS Ecology), Dr N Bull (Lathwida Environmental) and JBS&G for the Hydrogen Jobs Plan (HJP) which is an interdependent project to be constructed adjacent to the western end of the Whyalla Hydrogen Pipeline.

2. Compliance

2.1 Legislation, policies and guidelines

This plan has been prepared in accordance with the following relevant pieces of legislation, policies and guidelines:

- Commonwealth
 - Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)
 - Environmental Management Plan Guidelines (DCCEEW 2024)
 - Conservation Advice for Western Grasswren (Gawler Ranges) (*Amytornis textilis myall*)
 - Conservation Advice for Southern Whiteface (*Aphelocephala leucopsis*)
 - Conservation Advice for Malleefowl (*Leipoa ocellata*)
- State
 - Energy Resources Act 2000 (ER Act)
 - National Parks and Wildlife Act 1972 (NPW Act)
 - Animal Welfare Act 1985
- Local

There are no relevant local policies, legislation, guidelines and approval conditions as of November 2024.

2.2 Conditions of approval

The plan has also been prepared to meet the relevant approval conditions for the WHP as shown in Table 2-1.

Table 2-1: Conditions of EPBC Act approval reference table

EPBC Approval Condition	Comment / Reference
To be completed following approval decision	

3. Epic Energy environmental management

3.1 Environmental management system

The Epic Energy Environmental Management System (EMS) provides a framework for the management of environmental responsibilities, issues and risks associated with the operation, maintenance, construction and decommissioning of pipelines and associated infrastructure. The EMS ensures that commitments contained within Epic Energy's Environmental and Land Access Policy are achieved and provides clarity and direction for employees and contractors. The EMS is based on a continuous improvement model as defined in the Australian/New Zealand Standard ISO 14001:2015 *Environmental Management Systems – Requirements with guidance for use*.

The EMS applies to all personnel associated with and activities undertaken for Epic Energy and addresses pipeline construction (including route selection, design, land access and construction activities), pipeline operations and maintenance, and operation and maintenance of ancillary facilities.

The 'environment' is defined as the surroundings in which Epic Energy operates including:

- land, air, water (surface and underground), organisms and ecosystems
- buildings, structures, cultural artefacts, and other heritage factors
- social and economic life
- amenity value of an area.

The EMS is used to integrate objectives, plans and activities into daily operations to ensure a systematic approach to environmental management. The EMS consists of an Overview Manual and supporting documents including the policy, risk and compliance registers, management plans, procedures, work instructions, as well as monitoring and auditing programs. The EMS consists of five elements and associated sub elements:

1. Commitment
2. Planning
3. Implementation
4. Measurement and evaluation
5. Review and improvement.

The elements are interrelated, and the proper implementation of each element is essential for the effective functioning of the EMS.

This Threatened Species Management Plan forms part of the suite of environmental management procedures established within the EMS. Epic Energy will incorporate the relevant management actions into procedures and plans for contractors to comply with its contents.

3.2 Environmental management plans

The Epic Energy Construction Environmental Management Plan (CEMP) is the document that describes the actions Epic Energy will take to minimise impacts prior to and during construction of the Project. The CEMP and associated plans will cover, amongst other issues, the following issues:

- rehabilitation management
- weed, pest and disease management
- sedimentation, erosion and drainage management

- landholder liaison
- cultural heritage management
- bushfire management, including lightning management
- waste management.

Once construction is finished, an Epic Energy Operational Environmental Management Plan (OEMP) will describe the actions Epic Energy will take to minimise impacts during operation of the WHP.

3.3 Environmental commitment

Epic Energy is committed to responsible environmental management for the construction and operation of the proposed pipeline and believes that any potential adverse environmental impacts can be managed in an effective manner that complies with the requirements of this document together with:

- all relevant State and Commonwealth laws and regulations
- Epic Energy's Environmental Management System
- relevant industry standards (e.g. Australian Standard AS 2885: Pipelines – Gas and Liquid Petroleum)
- the Australian Pipelines and Gas Association (APGA) Code of Environmental Practice – Onshore Pipelines (APGA 2022).

Epic Energy aims to minimise its impact on the environment through activities such as:

- complying with all relevant environmental legislation and standards
- ensuring its employees are aware of Epic Energy's environmental responsibilities
- adopting new technologies and best practices to reduce environmental impact
- minimising land and habitat disturbance
- open communication with landowners and other stakeholders
- identifying, monitoring and mitigating environmental issues
- focussing on continual improvement in its environmental performance through regular review
- endeavouring to prevent pollution and developing opportunities for recycling and more efficient use of energy, water and other resources.

3.4 Environmental impacts and aspects

Epic Energy is committed to identifying and managing environmental impacts for all activities and maintains an Environmental Risk Register, managed via the online Corporate Governance Risk system, which documents key activities, environmental aspects and impacts, business consequence and control measures identified through risk assessment processes.

Control measures for environmental impacts are implemented through:

- development of control documentation such as environmental procedures, work instructions, guidelines, emergency response plans and management plans
- implementation of the above documentation via the Environmental Management Induction and the Operations Field Induction
- briefing staff on environmental responsibilities
- complying with regulatory requirements

- ongoing monitoring of the effectiveness of control measures
- corrective action to improve on control measures.

3.5 Environmental training

Training and education ensure employees have the skills to undertake their work in an environmentally sound manner. All employees are required to complete:

- corporate induction, which provides introduction to the environmental program
- online Environmental Induction for all workers which introduces Epic Energy's EMS, environmental risks, documentation, responsibilities and implementation strategies
- operations Field Induction, which includes an environmental component and provides a broad introduction to environmental risks and management requirements. All Epic Energy employees and contractors are required to complete the induction prior to engaging in field activities. This training will also include awareness of this Threatened Species Management Plan, as relevant to the employee's role and the relevant EMPs
- additional face to face training as required to address specific environmental issues or field-based risks.

Records of all training conducted will be maintained and include:

- the person receiving the training
- the date the training was received
- the name of the person conducting the training
- a summary of the training.

All Epic Energy staff are briefed on environmental responsibilities by line management prior to commencement of new activities.

Recruitment, selection and placement processes ensure that personnel with environmental responsibility have the required experience, knowledge and skills to undertake their position.

Environmental competency requirements and key accountabilities are defined for individual roles and included in position descriptions.

4. Environmental management roles and responsibilities

Epic Energy is responsible for management of construction activities in the Project Area. All Epic Energy employees and contractors are responsible for conforming to applicable Australian and South Australian laws and regulations and conducting work in accordance with permit and approval conditions, Epic Energy's EMS, CEMP, OEMP (and sub-plans) and this Plan.

An overview of the roles and responsibilities of Epic Energy personnel and the Principal Contractors are summarised in Table 4-1. Detailed descriptions of roles and responsibilities are provided in the Principal Contractor's CEMP and sub-plans.

Table 4-1: Roles and responsibilities during the Project planning, construction and operations phases

Role	Responsibility
Contractor Project Manager	<ul style="list-style-type: none"> Responsible for ensuring the Contractor complies with the specification, requirements of this plan and satisfying reporting requirements of the EPBC Approval Notice 2023/09873.
DCCEEW	<ul style="list-style-type: none"> Responsible for administering <i>Environment Protection and Biodiversity Conservation Act 1999</i> matters
Epic Energy	<ul style="list-style-type: none"> Obtain statutory approvals for the Project. Comply with conditions of statutory approvals. Ensure all contractors operate in accordance with the EPC Contract. Complete environmental audits. Ensure all Epic Energy personnel are competent to perform their assigned duties. Ensure all Epic Energy personnel have received appropriate training and inductions. Preparation of the OEMP and relevant sub-plans Implement the management actions identified in the OEMP and sub-plans.
Principal Contractor	<ul style="list-style-type: none"> Overall responsibility for environmental compliance, including monitoring, data collection and reporting. Comply with conditions of statutory approvals Maintain documentation and compliance system to ensure compliance with approval conditions and the CEMP. Preparation and implementation of the CEMP and sub-plans. Inclusion of the management measures outlined in this Plan into the CEMP/OEMP and sub-plans. Ensure resources are available to manage environmental obligations and implement management actions. Identify and address risks associated with Contractor's activities prior to commencing works. Ensure all contractor personnel are competent to perform their assigned duties. Ensure all contractor personnel have received appropriate training and inductions. Ensure that personnel are adequately supervised. Ensure that all activities are carried out in accordance with the statutory approvals, CEMP and sub-plans. Implement the management actions identified in the CEMP and sub-plans.

Role	Responsibility
	<ul style="list-style-type: none"> Immediately notify the Project Manager of any incidents and non-compliances with the CEMP or statutory approvals conditions. Undertake project auditing and monitoring.
Suitably qualified fauna spotter and catcher	<ul style="list-style-type: none"> Responsible for providing expert advice to the Project Manager and/or Principal Contractor including: <ul style="list-style-type: none"> Pre-clearance surveys. Implementing threatened species no-go zones. Dealing with fauna trapped in trenches.
Environmental advisor (including Project Manager and Personnel)	<ul style="list-style-type: none"> Responsible for the implementation of this plan (including maintaining no-go zones and implementing the management measures specified in section 9).
Suitably qualified environmental contractors	<p>Responsible for undertaking environmental monitoring requirements as outlined within Section 9, including:</p> <ul style="list-style-type: none"> Inspection of vegetation clearing and report. Pre-construction vegetation clearance report and post- construction audit and report. Monitoring of vegetation regeneration following rehabilitation. Weekly soil / surface water inspection and post-construction audit. Incident investigation in the case of spills, unauthorised access or EPBC-listed fauna mortality. Fortnightly noise inspection during the construction period. Monthly dust inspection during the construction phase. Weed survey undertaken every six months during construction and annually during operation until a stable state can be demonstrated. Monthly weed or pathogen check of records to confirm all fill brought to site has the appropriate certification. Monthly pest animal inspection. One-off lighting inspection following installation of any new lighting. In the case of a fire, investigation completed within 30 days of any incident.

5. Project description

5.1 Project details

The WHP comprises the following key components:

- A compressor station at the Whyalla Hydrogen Facility to compress the hydrogen for injection and withdrawal of hydrogen from the pipeline
- A buried and looped pipeline designed to store and transport hydrogen (nominally 900 mm diameter) approximately 45 km in length (22.5 km right-of-way length)
- A valve station located near Fitzgerald Bay Road, Port Bonython (near to where the pipeline will loop and return to the Whyalla Hydrogen Facility).

Hydrogen produced by the Whyalla Hydrogen Facility's electrolyzers would be compressed, injected into, stored under pressure and transported through the WHP. This stored hydrogen would be used to feed the hydrogen power station at the Whyalla Hydrogen Facility at times when the power station is delivering dispatchable power into the energy grid. Excess hydrogen produced at the HJP site would be stored in the WHP to be used to generate dispatchable power into the grid when required.

5.2 The proponent

The Proponent for the Proposed Action is Epic Energy and details are provided in Table 5-1.

Table 5-1: Proponent details

Proponent	Epic Energy
Registered ABN	54 068 599 815
Registered Address	L6 70 Franklin Street, Adelaide SA 5000
Nominated Contact	Vincent Kain
Phone	0407 070 028
Email	vincent.kain@epic.com.au
Website	epicenergy.com.au

5.3 Project location

The following spatial definitions apply to the location, boundaries and areas of the proposed action:

WHP alignment:

- a linear pipeline approx. 45 km (length), which loops around and parallels itself such that the total length of the construction right of way is approx. 22.5 km (Refer to Figure 5-1).

Project area:

- a 1,509 ha area of land that encompasses the proposed WHP alignment and all potential variations that could occur during final route selection and detailed design (Figure 5-1).
- Preliminary Survey Licence (PSL) area:
- 7,232 ha of land encompassing the Project area, which is subject to the PSL held by Epic Energy under the ER Act, permitting field-based investigations for the proposed action (Figure 5-1).

The WHP alignment commences at the Whyalla Hydrogen Facility at 27022 Lincoln Hwy, Whyalla Barson, then extends a further approximately 22.5 km to the east towards Port Bonython, as illustrated in Figure 5-1.

The proposed WHP is situated predominantly within the City of Whyalla local government area, with a short section in the unincorporated areas of Whyalla (i.e. land not within a council area) and is within the region overseen by the Eyre Peninsula Landscape Board. The Barngarla people have been recognised as the Traditional Owners of this region.

The pipeline route aligns with existing infrastructure corridors (including roads, tracks, rail and pipeline alignments) for the majority of its length. From its commencement at the Whyalla Hydrogen Facility, it crosses Lincoln Highway and the adjacent rail line, then parallels the rail line and highway northwards for approximately 2 km. It then heads generally eastwards for approximately 3 km, parallel to, and just outside of the northern boundary of the proposed Cultana Solar Farm (and south of the proposed Yoorndoo Ilga Solar project), then bearing north-east for approximately 3.5 km to Point Lowly Road, where it crosses to the north side of the road. It then heads in a generally south-easterly direction along the north side and parallel to Point Lowly Road for about 11 km before heading in an easterly direction along the north side of Fitzgerald Bay Road and terminating approximately 4.5 km north-west of Port Bonython.

The WHP alignment is indicative at this stage of development, with the final alignment subject to detailed engineering design and further refinement in some sections as consultation with affected landholders progresses.

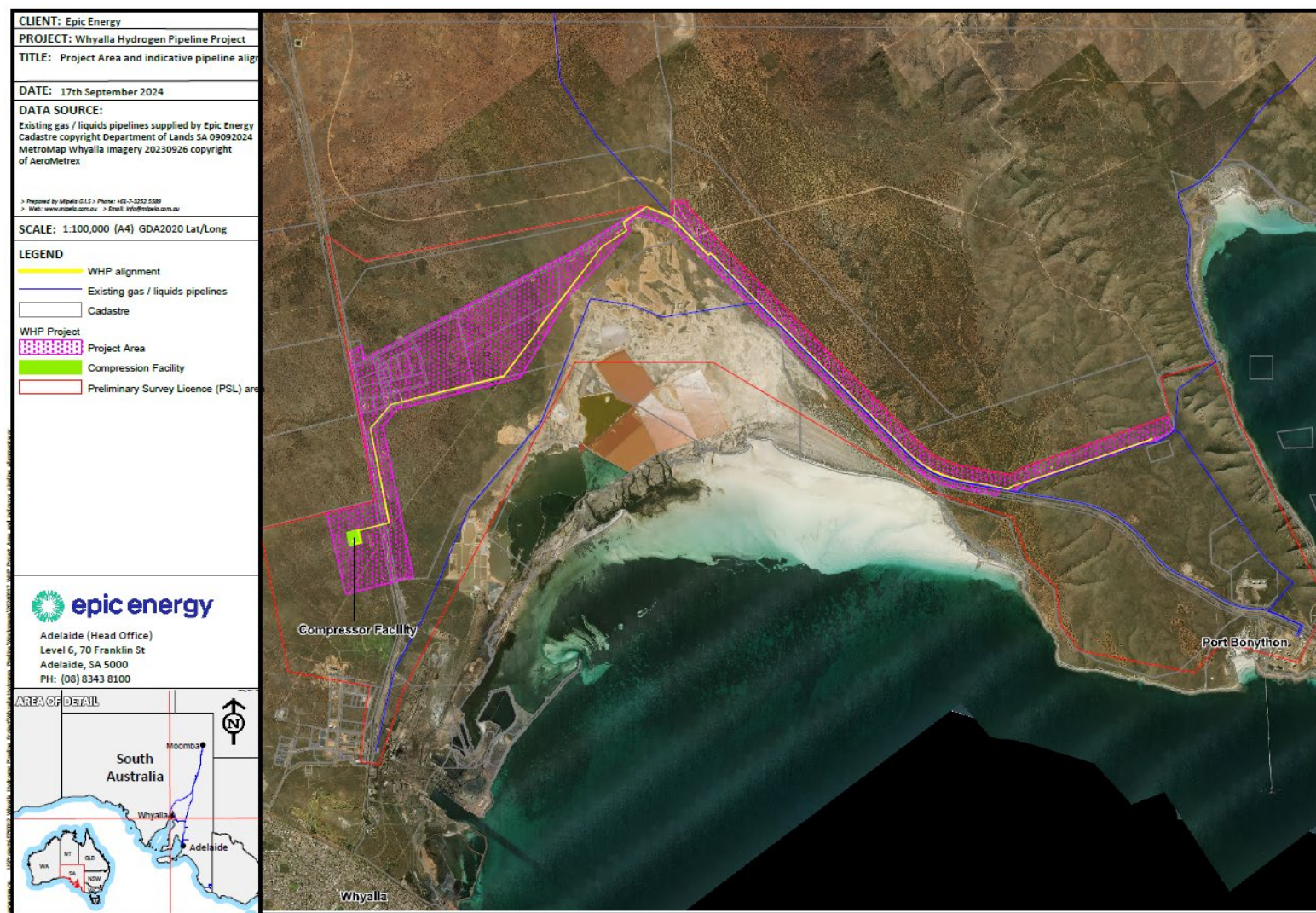


Figure 5-1: Project area and indicative pipeline alignment

5.4 Project design

The pipeline will be designed in accordance with the requirements of AS 2885, however, as the pipeline will be carrying hydrogen, the relevant requirements of the Hydrogen Pipeline Systems Design, Construction and Operation: A Code of Practice for the Australian Pipeline Industry (June 2024) will also be incorporated into the design of the pipeline.

The WHP has been designed to provide storage of 100 tonnes of hydrogen for the Whyalla Hydrogen Facility and to allow potential future hydrogen transmission to third-party users.

Key engineering and design features are provided in Table 5-2.

Table 5-2: Key engineering and design features

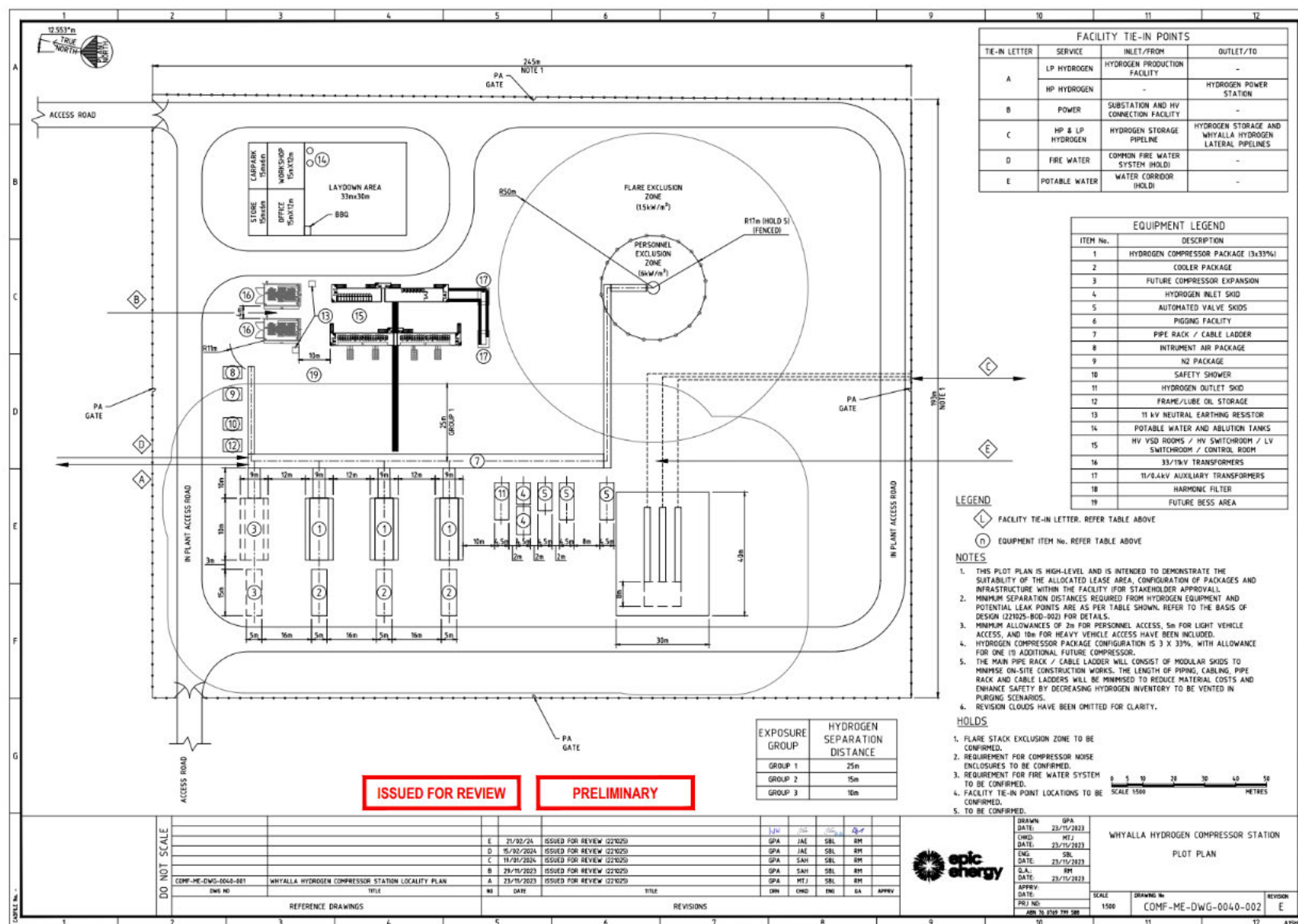
Design element	Details
Length	Approximately 45.2 km total (i.e. 22.6 km for each of the looped pipeline segments)
Diameter (nominal)	DN900 (i.e. 900 mm)
Separation between dual pipes	5 to 10 m
Wall Thickness	27 mm
Pipe Specification	API 5L X52 PSL2
Factory Coating / Field Joint Coating	DLFBE/HBE (dual layer fusion bond epoxy / high build epoxy)
Pipeline Content	Hydrogen gas
Operational Pressure (min / max)	1.5 / 6.5 MPa
Maximum Allowable Operating Pressure	6.5 MPa
Design Flow Rate	Filling: 5000 kgH ₂ /hr Discharging: ~15,840 kgH ₂ /hr
Nominal Storage Capacity	100 tonnes
Minimum Depth of Cover	In accordance with AS 2885:1, typically: <ul style="list-style-type: none"> • Location class R1 / R2 – 750 mm • Location class T1, HI – 900 mm • Road and Track Crossings (Sealed and Unsealed) – 1200 mm • Major Road Crossings (bored) – 1500 mm • Rail Crossings – 2000 mm • Watercourses – 1500 mm
Pipeline Easement	25-30 metres post construction (fully reinstated)
Corrosion Protection	Impressed current cathodic protection system
Non-Destructive Testing	100% radiography or ultrasonic testing of welded joints.
Hydrostatic Pressure Testing	Mainline test – 20.4 MPa (96% SMYS) Pipeline assemblies – 15.3 Mpa (1.5 x mechanical design pressure of 10.2 MPa) A leak test will be completed following the strength test.
Buried Marker Tapes	Installed above pipeline.
Pipeline Monitoring System	SCADA system for remote monitoring and control of all facilities along the pipeline.

A brief description of the pipeline facilities and associated infrastructure is provided in Table 5-3. The facilities will be designed in accordance with all relevant legislation and standards.

Table 5-3: Indicative pipeline facilities and infrastructure

Design element	Details
Compression facilities	Major components of the compressor station include 3x 33% electric drive reciprocating packages (with an allowance for potential future expansion to four packages) , gas filters to remove particulates, gas pressure regulation skids, air cooled heat exchanges, instrument air package, nitrogen generation package, a flare or cold vent, a HV transformer compound, lube oil storage, safety showers, a control room housing the automated control system and motors office, amenities, carpark and a workshop.
Metering and valve facilities	The station is designed to be operated from the Pipeline Control Room at Epic Energy located at 70 Franklin Street Adelaide SA and would be visited regularly for maintenance and instrument calibration.
Cathodic protection system	A mainline valve compound will be constructed at the far eastern end of the pipeline easement near Port Bonython.
SCADA system	A Cathodic Protection system will be incorporated into the pipeline design to protect the pipeline from external corrosion in conjunction with the external corrosion coating. This involves the use of impressed current Cathodic Protection system located at the Whyalla Hydrogen Facility connected to the buried pipeline via cabling and electrically isolated from the above ground piping using monolithic isolation joints.
Pipeline markers	In addition, cathodic protection test posts will be located approximately every 2 km. Test posts are required to allow for monitoring of the effectiveness of the cathodic protection system.

An indicative layout of the compression facilities is shown in Figure 5-2 (note that this layout is subject to revision in detailed design).



6. Staging of construction and operation

6.1 Project timing

The South Australian Government has set an operational date in 2026 for the Whyalla Hydrogen Facility. The WHP will need to be commissioned and in operation in line with the operations date for that facility.

It is anticipated that the WHP will take approximately 12 months to construct and commission. The schedule is dependent upon the timing of all required regulatory approvals. The anticipated timing is set out in Table 6-1.

The design life of the pipeline has not been finalised but is expected to be in the order of 40 years.

Table 6-1: Schedule

Project Phase	Timing
Planning/Pre-construction Activities	June 2025
Construction	September 2025
Operation/Maintenance	June 2027

6.2 Construction activities

A summary of key activities and approach to managing environmental impacts during the pre-construction phase is provided below. Detailed mitigation and management activities to be implemented during the pre-construction and planning phase are outlined in Section 9.

6.2.1 Overview

The pipeline will be sequentially constructed in accordance with the requirements of AS 2885 and in accordance with any conditions incorporated into the pipeline licence.

The pipeline will be buried effectively for its entire length and will generally involve trenching construction.

It is anticipated that construction of the looped pipeline will be undertaken by constructing each run of pipeline separately following the methods set out below. The first run of pipeline will be completed in a sequential manner (unless otherwise required by landowners) before the second run of pipeline (return loop) is constructed approximately 5-10 m from the first. This will minimise the construction footprint by enabling crews to use the disturbance area created during the first run for stockpiling topsoil when constructing the second run.

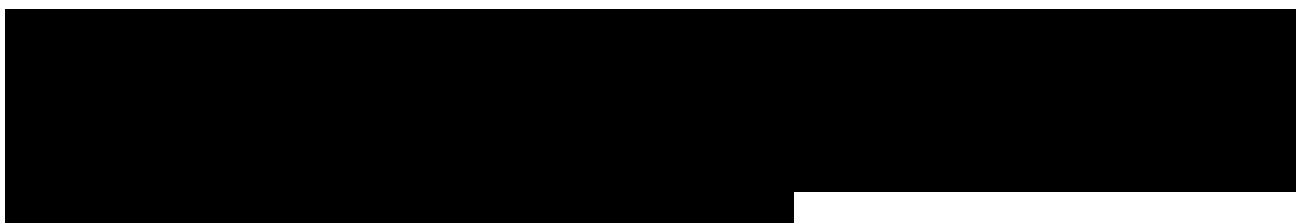
Pipeline construction activities and sequencing will follow standard industry practices and will involve:

- Survey – a surveyor will mark out and peg the construction right of way
- Setting up of work areas
- Establishing laydown area and equipment yard
- Clearing and grading - the clearing crew will remove trees, shrubs, boulders and other impediments that may prohibit construction. Cleared vegetation will be stockpiled on the edge of the construction right-of-way for re-spread during reinstatement. The grading crew will prepare a working surface for the construction workers and equipment that will follow.
- Pipe stringing, welding and field joint coating - sections of pipe will be laid out along the right-of-way to allow for qualified welders to weld and for application of field joint coating

- A trench approximately 1100 mm wide and range in depth from 1650-2100 mm to facilitate installation of the pipeline will be dug along the right-of-way to the surveyor's specifications using specialised trenching machines and excavators. Trench spoil will be stockpiled (windrowed) adjacent to the trench on the opposite side to the welded pipe string, keeping trench spoil segregated from stripped topsoil.
- Padding and lowering - the trench bed will be prepared by 'bedding' with a layer of material conforming to maximum particle size and distribution specification and the pipe lowered in.
- Backfilling - stockpiled trench spoil excavated during trenching will be returned to the trench and compacted following the lowering-in of the pipe. Special care will be taken to ensure that excavated spoil and soil profiles are re-established to avoid soil inversion. The subsoil contours will be reinstated, compacted areas de-compacted by ripping, and topsoil pulled back over the stripped area.
- Pipe cleaning - the pipeline will be cleaned with foam and/or brush pigs to remove weld debris, dust and surface scale.
- Hydrostatic testing - pipeline integrity will be verified using hydrostatic testing (hydrotesting) in accordance with AS 2885.5.

The key construction elements are listed in Table 6-2 and a typical pipeline construction layout is presented in Figure 6-1 (noting that this is for one pipeline run; the second pipeline run will be constructed in a similar fashion, parallel to the first with a separation distance of approximately 5-10 m). These elements may change depending on detailed engineering design and any conditions set out in the pipeline licence to be issued under the ER Act.

Construction is expected to be undertaken by a series of specialised crews (e.g. clear and grade, stringing, bending, welding and non-destructive testing, coating, lowering-in, backfill, reinstatement) that sequentially move along the alignment.



If a phased construction approach is adopted, the clearance of vegetation would be divided temporally in two stages with rehabilitation occurring immediately following construction of each phase.

Table 6-2: Key construction elements

Element	Description
Construction right-of-way width	45 – 50 metres with potential to pinch to 30 metres in short sections of greater sensitivity
Construction workforce	Peak workforce of approximately 520 people (inclusive of workforce for both pipeline and compressor facility construction activities)
Standard construction hours	6am – 6pm, 7 days / week
Construction duration	Approximately 12 months
Length of open trench	No limit – target 6 km subject to ground conditions
Expected time between clear and grade and restoration	Approx. 6 months

Figure 6-1 sets out how each pipeline run will be constructed for the Project. The second pipeline run will be constructed in a similar fashion, parallel to the first with a separation distance of approximately 5-10 m.

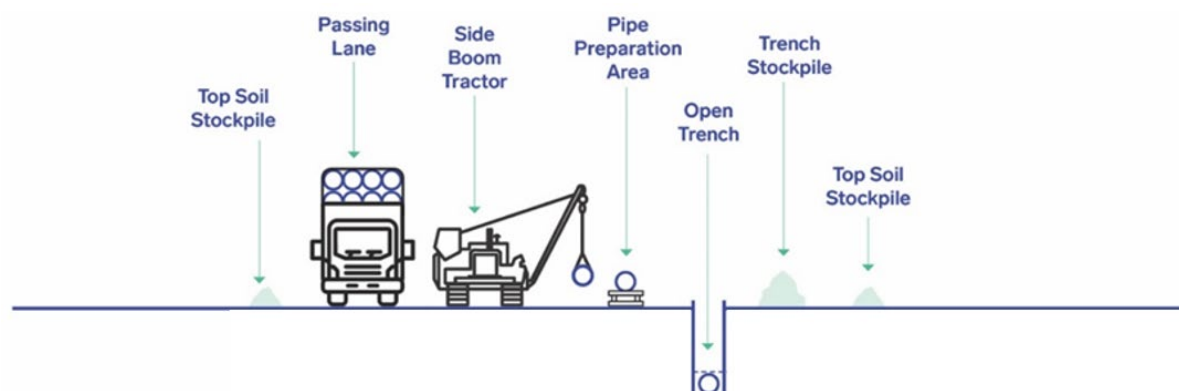


Figure 6-1: Typical layout for construction of a pipeline

6.2.2 Reinstatement, clean-up, and rehabilitation

Commencement of rehabilitation of the construction right-of-way will follow closely behind the mainline backfill of the second pipeline run, with strict adherence to all relevant regulatory requirements. The primary objective of rehabilitation works will be to restore disturbed areas to resemble their pre-clearance condition to the extent feasible.

Rehabilitation of the construction right-of-way will include the following steps:

- Stockpiled topsoil will be respread over the stripped area (as described in 'Backfilling' above)
- Surface drainage lines and other land features will be re-established
- Soils will be ripped in areas to relieve compaction (if applicable) and cleared vegetative material (e.g. shrubs and tree branches) reinstated along the construction right-of-way
- Natural regeneration will be allowed to occur within the disturbed areas to facilitate indigenous species regeneration and soil stabilisation
- Additional seeding will be undertaken using selected local species that match the vegetation communities traversed. Seed species selection will favour, where feasible, vulnerable fauna such as the Subject Threatened Species.

In addition to the ecological rehabilitation works described, pipeline marker signs will be installed to identify the pipeline location, crossovers, access tracks, temporary gates and fences will be removed and reinstated to original condition or in accordance with requirements of the relevant landowner.

Post-rehabilitation, a direct current voltage gradient (DCVG) survey will be conducted to verify the coating integrity of the pipeline. Subsequent inspections of the pipeline will be conducted to monitor the effectiveness of the rehabilitation activities detailed in the Project Construction Environmental Management Plan (CEMP).

Regular inspections will be scheduled both during and after construction to detect any signs of trench subsidence, with erosion and sediment control measures maintained as necessary.

Upon completion of all rehabilitation activities, access to the pipeline will be restricted to essential maintenance tasks only to ensure successful re-establishment of ground cover.

6.2.3 Watercourse and infrastructure crossings

Crossings of watercourses or drainage lines are expected to be constructed using standard open cut (trenching) construction. This technique is most suited to the dry, low flow conditions characteristic of the arid lands. Should high flowing water be encountered, flow diversion techniques will be employed where necessary.

The standard open cut method involves establishing a stable working platform either side of the watercourse and creating a trench using excavators. The trench will not be completed through the banks until immediately prior to pipe installation. Tie-in points (where the section of pipe used for the water course crossing is connected to the adjacent pipeline section) will be located on high ground well away from the banks.

Watercourse bed and bank material and trench spoil will be stockpiled separately. Pipe string welding and field joint coating will occur prior to placement in the trench. Where there is water in the trench at watercourse crossings and in areas of significant inundation (as identified by risk assessment in compliance with AS 2885.1) trench dewatering or buoyancy control measures may be implemented to prevent the pipe 'floating' once in place.

Flow diversion techniques can be used to prevent siltation during trenching, lowering in and backfilling if higher water volumes and flows are encountered (typically up to 1,000 litres per second). These techniques involve temporarily redirecting watercourse flows away from the active work area and require construction of barrier dykes or head walls upstream and downstream of the active work area. Once barriers are in place, the waterflow will be either piped around the work area (not suitable for watercourses with broad channels, low gradients or permeable substrates) or the work area will be pumped dry. Flow diversion techniques are unlikely to be required given the arid climate, the ephemeral nature of the drainage line to be crossed, and Epic Energy's commitment to, as far as practicable, avoid construction of this crossing during periods of flood or heavy rainfall.

To minimise the period of construction and subsequent environmental disturbance, Epic Energy aims to complete watercourse crossings within the shortest period practicable (small watercourse crossings would typically be completed within 1-2 days). State agencies responsible for water resources will be consulted prior to construction and during restoration and appropriate approvals in place prior to construction.

6.2.3.1 Boring

The technique of boring will be used to install pipelines beneath infrastructure such as roads, the ARTC railway line and any buried utilities. It is a low impact technique involving drilling short distances from below ground within an enlarged trench area, or bellhole, located inside the construction right of way.

6.2.4 Compressor station construction

Initial compressor station construction activities will include site establishment works including establishment of access to the Lincoln Highway, clearing of the site and establishment of general laydown hardstand areas (for office, amenities, car parking and equipment storage). These works will be undertaken by contractors on behalf of OHPSA as part of the Whyalla Hydrogen Facility works.

The construction footprint for the compression facility is nominally 250 m x 200 m. It will include an equipment laydown area, offices, and a truck quarantine area and carparking on the Northern boundary to support construction works.

After the site has been established by OHPSA, piles and concrete foundations will be installed for the buildings, pipework and equipment to be installed on these. Equipment and pipework will be both skid-mounted and constructed on site to maximise construction efficiency and minimise supply chain risk. Buried services such as earthing grids, service water and cable pits will be installed, and cables and pipework will be constructed to connect the installed equipment.

Most of the major equipment and structural, mechanical, piping, electrical and instrumentation components will be manufactured outside of Australia, although fabrication of skids and installation of equipment will be undertaken within Australia where equipment is shipped as separate components. It is anticipated that the major equipment and structural, mechanical, piping, electrical and instrumentation components will be transported to the Port of Adelaide by ship, then transported by semi-trailer to the compressor station in Whyalla for installation.

Testing and commissioning of the associated compressor station and pipeline equipment may involve hydrostatic testing of pipework, as well as non-destructive testing of mechanical and electrical equipment to ensure it has been installed correctly and is ready for commissioning. Commissioning involves the introduction of gas and fine tuning of equipment and instrumentation by running the equipment through various operating modes to test performance. Once performance is verified and the equipment is deemed safe to operate, the compressor station will be ready for commercial operation.

Construction of the associated surface facilities is estimated to take approximately ten months to complete, with around three months for commissioning. Commissioning will occur sequentially and overlap with the construction phase, such that construction and commissioning of the compressor station is estimated to require 12 months in total.

6.3 Operational / maintenance requirements

A summary of key activities and approach to managing environmental impacts during the operational phase is provided in Table 5-3. Detailed mitigation and management activities to be implemented during the operational phase are outlined in Section 9.

After reinstatement of the construction right-of-way, there will be very little above-ground infrastructure visible. Above-ground infrastructure will be limited to marker posts to identify the location of the pipeline, compression and associated facilities on the main Whyalla Hydrogen Facility site and a small, fenced facility at the end of the line valve station.

The pipeline will be operated in accordance with the pipeline licence, an OEMP and all relevant legislation and standards.

A routine operation and maintenance program will be implemented, which will include leak detection surveys, ground and aerial patrols, in-line inspection, repair or replacement of faulty pipe or other equipment, pigging and cleaning of the pipeline, corrosion monitoring and remediation and easement and lease area maintenance. Aerial and / or ground inspections will include checking vegetation for discolouration which can be an indicator of a leak, detection of erosion, monitoring of rehabilitation success and detection of weed species.

Operational pipelines generally have very little environmental or landholder impact. Regular consultation will be maintained with landowners whose properties are traversed by the pipeline. The 'Before You Dig Australia' service will be promoted for use by third parties wishing to locate the pipeline prior to undertaking excavations.

Table 6-3: Summary of pipeline operational activities

Activity	Description
Easement Maintenance	
Line of sight clearance	Clearance of the right-of-way to maintain line of sight is generally not required in arid regions with predominantly low open grassland or shrubland. Trees retained on the easement during construction will not be removed, however it may be necessary to remove trees that regenerate within 2 m of the pipeline as they pose a threat to pipeline integrity.
Patrolling/inspections – easement access	Undertaken by travelling along the right-of-way, on private / public roads or over paddocks and will involve access to private property and use of private tracks.

Activity	Description
	Frequency depends on whether particular issue(s) require monitoring; frequency can range from weekly to monthly or longer. Vantage point patrols are performed every three months and full patrols conducted every 12 months.
Aerial inspection of easement	Inspections are undertaken using low-flying aircraft and typically carried out every 12 months.
Pipeline Operations	
Cathodic protection surveys	Surveys involve taking readings at Cathodic Protection test points (above-ground post) along the easement. Typically conducted twice per year.
Testing and inspection of relief valves	Controlled venting of minimal quantities of hydrogen gas to atmosphere is involved. Typically occurs once per year with a duration of approximately 30 seconds.
Erosion events	Following major rainfall events creek lines or run-off areas on right-of-way can experience soil erosion. Repairs are effected immediately following the erosion event and include the replacement of similar materials and re-profiling. Given the area is so flat, this is not expected to be a regular occurrence.
Emissions	Hydrogen gas is released to the atmosphere as a result of pipeline and facility maintenance operations (i.e. unit blow downs/ venting, valve opening/testing). Small volumes are released. Occurs for duration of operational life.
Pipeline Incident	The main threats to public safety from pipeline operation and maintenance are fire, explosion or radiation exposure as a result of pipeline rupture. Pipeline risk assessments have identified that these threats are associated with factors such as third party or external interference to the pipeline and pipeline corrosion.
Pipeline Maintenance	
Pigging / in-line inspection	Intelligent pigging will be conducted for in line inspections purposes. These inspections will be carried out every 5 years and will require the pipeline to be vented. As a part of the planning, the pipeline pressure will be drawn down to the minimum operating pressure of 1.5 Mpa using the compressors and the remaining hydrogen vented or flared to atmosphere. This could be up to 30 tonnes of hydrogen every 5 years.
Excavations	Excavations of the pipeline follow the same processes as those identified in Section 2.6.1, namely clear and Grade, trenching, backfill and restoration and rehabilitation but are generally on a much smaller scale. Once vegetation and topsoil have been cleared and stockpiled, the excavation is performed and spoil stockpiled. The pipeline maintenance is then undertaken (this may include welding, painting, sand blasting). Once complete the trench is backfilled, the ground surface is re-contoured and the topsoil and vegetation respread. Some reseedling will be undertaken if necessary. These activities may occur during the first year of operation to rectify defects but are expected to be very rare during the life of the pipeline.
Replacement of pipeline section	A section of the pipeline is isolated and a controlled release of hydrogen gas is undertaken from the affected section. The affected area is then excavated, the old pipeline removed and replaced (includes welding, blasting, coating) and the site reinstated. This is expected to be very infrequent.
Welding	Welding is usually required when pipeline repairs or modifications are made to existing infrastructure.
Coating	Sleeves or tape or epoxy painting (spray) are expected to be used to coat welds or repair areas of pipeline or above ground pipeline.
Pressure testing	Pressure testing is required when a section of pipe is replaced. Pressure testing, even for small sections of pipe, follows the same processes as those identified in Section 2.6.1 – Hydrostatic testing.
Facility Operation and Maintenance	

Activity	Description
Compressor facilities	This station would operate daily with an expected duty of up to 55% (4796 hours per year) to compress the hydrogen for storage in the pipeline or for supply of hydrogen to the power station. The flare at the compressor facility is expected to operate on an intermittent and infrequent basis (e.g. daily/weekly for a duration of under 15 minutes).
Weed control, weed and pest management	Localised spraying of weeds is undertaken in and around compounds. Weed and pest management include pre construction weed surveys, monitoring during construction and control management during operation.
Production of hazardous waste	Liquids and heavy metals (e.g. mercury) are not expected in the product, but if present they would be trapped in coalescing filters. Contaminated filters are generated from maintenance change-overs at the compressor facilities. Contaminated waste and oils will be removed from site for disposal by a licensed contractor.
Waste disposal	General waste generated during operations is collected on site and removed to licensed facilities for disposal.
Station blow downs	Uncontrolled venting which is a result of equipment failure e.g. regulator failure. Duration would depend on type and duration of failure

6.3.1 Workforce and hours

The construction workforce is anticipated to peak at approximately 520 people (inclusive of workforce for both pipeline and compressor facility construction activities). Construction is planned to be approximately 12 months.

Construction hours are proposed to be 0600-1800, 7 days/week.

6.4 Disturbance footprint

The construction phase (temporary) disturbance footprint is approx. 134 ha, which includes 32 ha of existing disturbance area and 102 ha of new disturbance area. The operational phase (permanent) disturbance footprint is approx. 0.16 ha at the location of the mainline valve (MLV) station.

Consequently, approximately 102 ha of native vegetation will be cleared then rehabilitated following construction, and 0.16 ha will remain permanently cleared. Therefore, 99.84% of vegetation cleared for the Proposed Action will be rehabilitated after completion of construction.

Table 6-4: Breakdown of disturbance footprint

Disturbance areas	Total footprint (ha)	Temporary construction footprint (ha)	Permanent operational footprint (ha)	Proportion to be revegetated
Existing disturbance	31.99			
New disturbance	102.17	102.01	0.16	99.84%
Total	134.17			

The WHP disturbance footprint has been refined and minimised through rigorous ecological assessment and careful planning. It incorporates, to the extent possible, existing roads and access tracks and other existing disturbed areas such as borrow pits. No permanent roads or access tracks will be constructed.

7. Subject Threatened Species

7.1 Western Grasswren (Gawler Ranges) (*Amytornis textilis myall*)

7.1.1 Taxonomy

Species

The Western Grasswren (*Amytornis textilis*) is a passerine of the family Maluridae (Christidis & Boles 1994). The Western Grasswren was formerly considered as conspecific with the Thick-billed Grasswren (*Amytornis modestus*) until split as a separate species in 2010 (Black et al. 2010).

Subspecies

Analysis of plumage, morphology and genetic findings amongst populations identified five subspecies of Western Grasswrens in the *A. textilis* family (Austin et al. 2013, Black 2011, Black and Gower 2017, Garnett and Baker 2021). The subspecies of relevance to the WHP is *A. t. myall* (Western Grasswren (Gawler Ranges)).

7.1.2 Conservation listing

Commonwealth classification

The Gawler Ranges subspecies of Western Grasswren (*A. t. myall*) is listed as 'Vulnerable' under the EPBC Act (Date effective 06-Nov-2014).

State Classification

A. t. myall is also listed as 'Vulnerable' in South Australia under the *National Parks and Wildlife Act 1971*.

IUCN Red List Classification

A. textilis has been assessed by *International Union for Conservation of Nature (IUCN) Red List of Threatened Species* in 2016 where it is listed as 'Least Concern'.

A. textilis myall has not been assigned a conservation classification on IUCN Red List. However, *The Action Plan for Australian Birds 2020* (Black, Copley and Garnett 2021) categorises *A. textilis myall* as 'Least Concern'.

7.1.3 Occurrence of Western Grasswren in the Project area

The following description is adapted from Lathwida (2024a).

The Western Grasswren is scattered and widespread in the Myall Creek and Pine Creek drainages of the north-eastern EP, bounded in the south by Munyaroo CP, and in the north towards Lake MacFarlane and eastern Lake Gairdner and Lake Gilles CP (Garnett and Baker 2021). The species Area of Occupancy and Extent of Occurrence is shown in Figure 7-1.

The species prefers low dense chenopod shrublands, mainly comprising Black Bluebush (*Maireana pyramidata*) and Australian Boxthorn (*Lycium australe*) and spiny shrubs, however the species also prefers semi-arid low open woodlands, mostly comprising Western Myall (*Acacia papyrocarpa*) and Senna shrublands (Black et al., 2009, Menkhorst et al. 2017). Preferred habitats are in drainage lines as well as low rocky hills (DotE 2014).

Western Grasswren has been detected in low open Western Myall woodlands over chenopod in fenced areas of the PSL Area proposed for solar farms (DEW 2024) and immediately east of Lincoln Highway (north and south of Port Bonython Road) in similar habitat and areas mapped as Chenopod with emergent trees (EBS 2023). The species was also detected at three song meter sites as part of field surveys for the current assessment; located east of Lincoln Highway (Figure 7-2). The species was also detected along Port Bonython Rd and Fitzgerald Bay Road in winter 2024. The habitat where the species was detected via song meter was generally considered suboptimal, given the cover of Ward's Weed, presence of predators, reduced cover of

chenopods and minimal spiny shrubs, however there was presence of Western Myall, as well as Black Oak, Bullock Bush and False Sandalwood for roosting.

The Project area east of Lincoln Highway does not contain any 'preferred habitat' of drainage lines with dense Black Bluebush (*Maireana pyramidata*). Based on anecdotal evidence, the species has been undergoing a 'boom' period over the last couple of years, being detected throughout its range in both preferred, atypical and suboptimal habitats where they have not been detected previously (including east of Lincoln Highway and areas southwest of Whyalla (Jacobs 2023a, 2023b, Infrastructure SA 2024, EBS 2023, Lathwida 2024b). There are also areas of suitable habitat in DoD land east of Lincoln Highway / Fitzgerald Bay Road, however some of these areas have had little survey effort given access issues and risk of Unexploded Ordnance.

7.1.4 Suitable habitat in the Project area

Highly conservative habitat mapping is provided in Figure 7-2 showing the extent of suitable and low suitable habitat (combined) for the species across the Project area. Note the bulk of this is east of the range of previous records for the species.

Construction of the Project will require temporary clearing of up to 76 ha of vegetation that represents potential habitat for Western Grasswren (35 ha suitable, 41 ha low suitability) as shown in Table 7-1. Over 99% of this habitat will be rehabilitated following construction.

Table 7-1: Western Grasswren habitat in the disturbance footprint (estimated worst case)

Habitat suitability	Total new disturbance (ha)	Operational disturbance footprint (ha)
Suitable (Western Myall chenopod shrubland +/- Black Oak, Bullock Bush, False Sandalwood and Chenopod open shrublands +/- emergent trees, mixed shrubland in drainage line)	35.23	
Low suitable (Low open Chenopod shrublands and Chenopod / Samphire on plains or infrequent inundation)	40.94	0.16
Total (ha)	76.17	

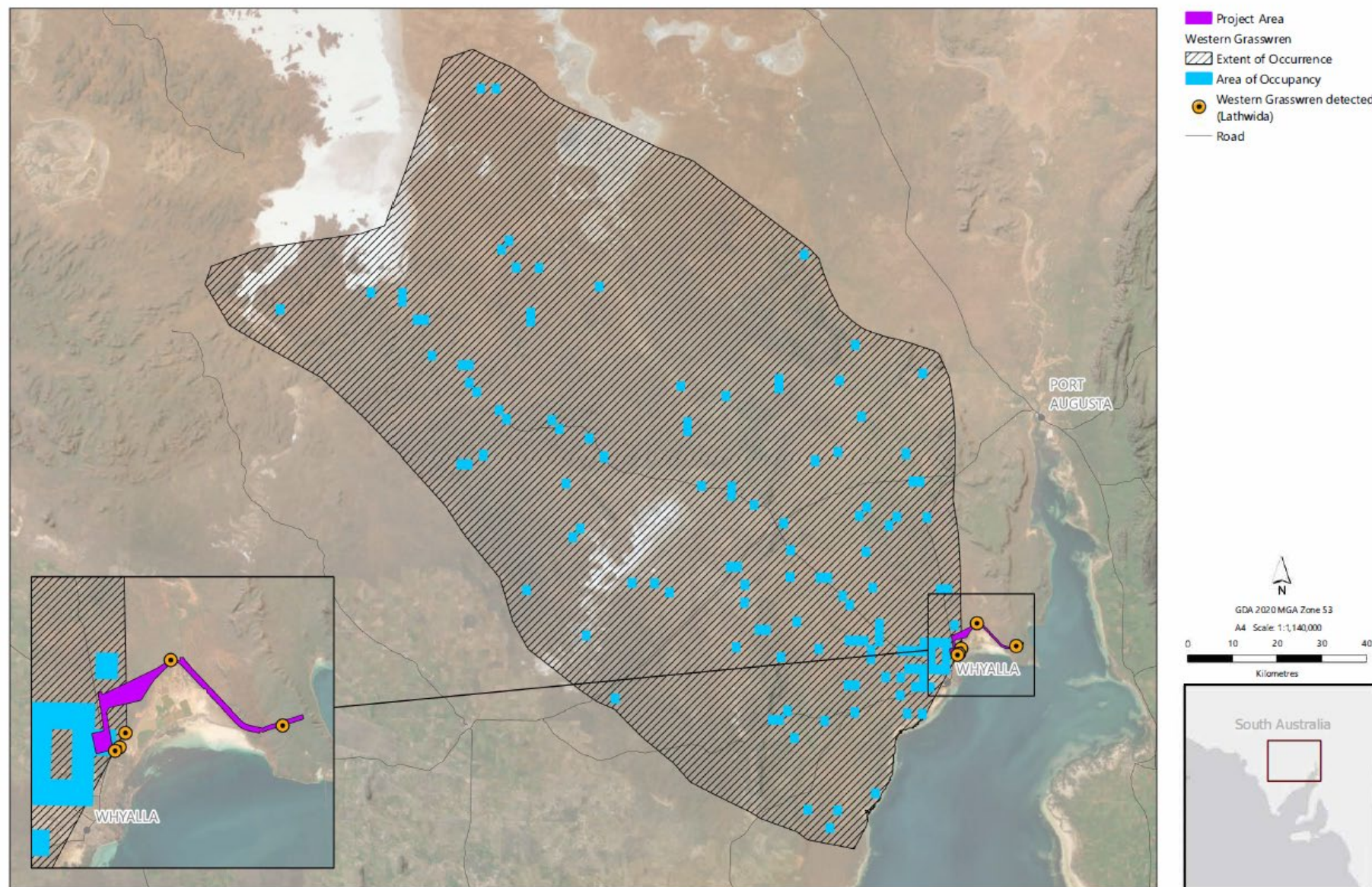


Figure 7-1: Western Grasswren Area of Occupancy and Extent of Occurrence (Lathwida 2024a)



Figure 7-2: Conservative habitat mapping for Western Grasswren and records around the Project Area (Lathwida 2024a)

7.2 Southern Whiteface (*Aphelocephala leucopsis*)

7.2.1 Conservation listing

Commonwealth Classification

The Southern Whiteface (*Aphelocephala leucopsis*) was listed as Vulnerable under the EPBC Act on 31 March 2023 (DCCEEW 2023).

State Classification

Southern Whiteface has not been assigned a conservation classification in South Australia under the *National Parks and Wildlife Act 1971*.

IUCN Red List Classification

Aphelocephala leucopsis has been assessed by *International Union for Conservation of Nature (IUCN) Red List of Threatened Species* in 2016 where it is listed as 'Vulnerable'.

The Action Plan for Australian Birds 2020 categorises *Aphelocephala leucopsis* as 'Vulnerable'.

7.2.2 Occurrence of Southern Whiteface in the Project area

The following description is adapted from Lathwida (2024a).

Southern Whiteface occurs across most of mainland Australia south of the tropics in a wide range of open woodlands and shrublands where there is an understorey of grasses or shrubs, or both. Usually in habitats dominated by Acacias or Eucalypts on ranges, foothills and lowlands, and plains (Higgins & Peter 2002, cited in DCCEEW 2023). The species prefers low tree densities and herbaceous understorey / litter cover for foraging. Living and dead trees with hollows and crevices are used for roosting and nesting (DCCEEW 2023). The species Extent of Occurrence is shown in Figure 7-3.

The species has been detected via song meter and bird surveys in the vicinity of the PSL Area for the NWP (Infrastructure SA 2024). There are also recent BDBSA records within the PSL Area (from 2021 and 2023), east of Lincoln Highway/south of Port Bonython Road adjacent the salt pans, and a number of BDBSA records in the Whyalla Conservation Park (DEW 2024). The species was also detected in the PSL Area as part of spring surveys for the HJP (EBS 2023).

Habitat deemed critical for the survival of the species is broadly defined as areas of relatively undisturbed open woodland and shrublands with an understorey of grasses or shrubs, habitat with low tree densities and an herbaceous understorey litter covers which provides essential foraging habitat, and living and dead trees with hollows and crevices which are essential for roosting and nesting (DCCEEW 2023). Within the Project Area suitable habitat will occur within areas of vegetation mapped as Western Myall Woodland over Chenopod, with or without other tree species such as Black Oak, False Sandalwood and Bullock Bush. Mallee woodlands, which are also floristically diverse will also provide suitable habitat for the species.

7.2.3 Suitable Habitat in the Project area

Highly conservative habitat mapping is provided in Figure 7-4 showing the extent of suitable and low suitable habitat (combined) for the species across the PSL Area. This includes roosting/nesting (habitats that include trees) and potential foraging habitat (habitats that include trees as well as adjacent habitats).

Construction of the Project will require clearing up to 61 ha of suitable habitat for Southern Whiteface as shown in Table 7-2. Over 99% of this habitat will be rehabilitated following construction.

Table 7-2: Southern Whiteface habitat in the disturbance footprint (estimated worst case)

Habitat suitability	Total new disturbance (ha)	Operational disturbance footprint (ha)
Suitable (Western Myall chenopod shrubland +/- Black Oak, Bullock Bush, False Sandalwood)	33.79	
Suitable (mallee, mixed shrubland in drainage)	27.02	
Low suitable (low open chenopod shrublands +/- emergent trees)	23.09	0.16
Total (ha)	83.89	

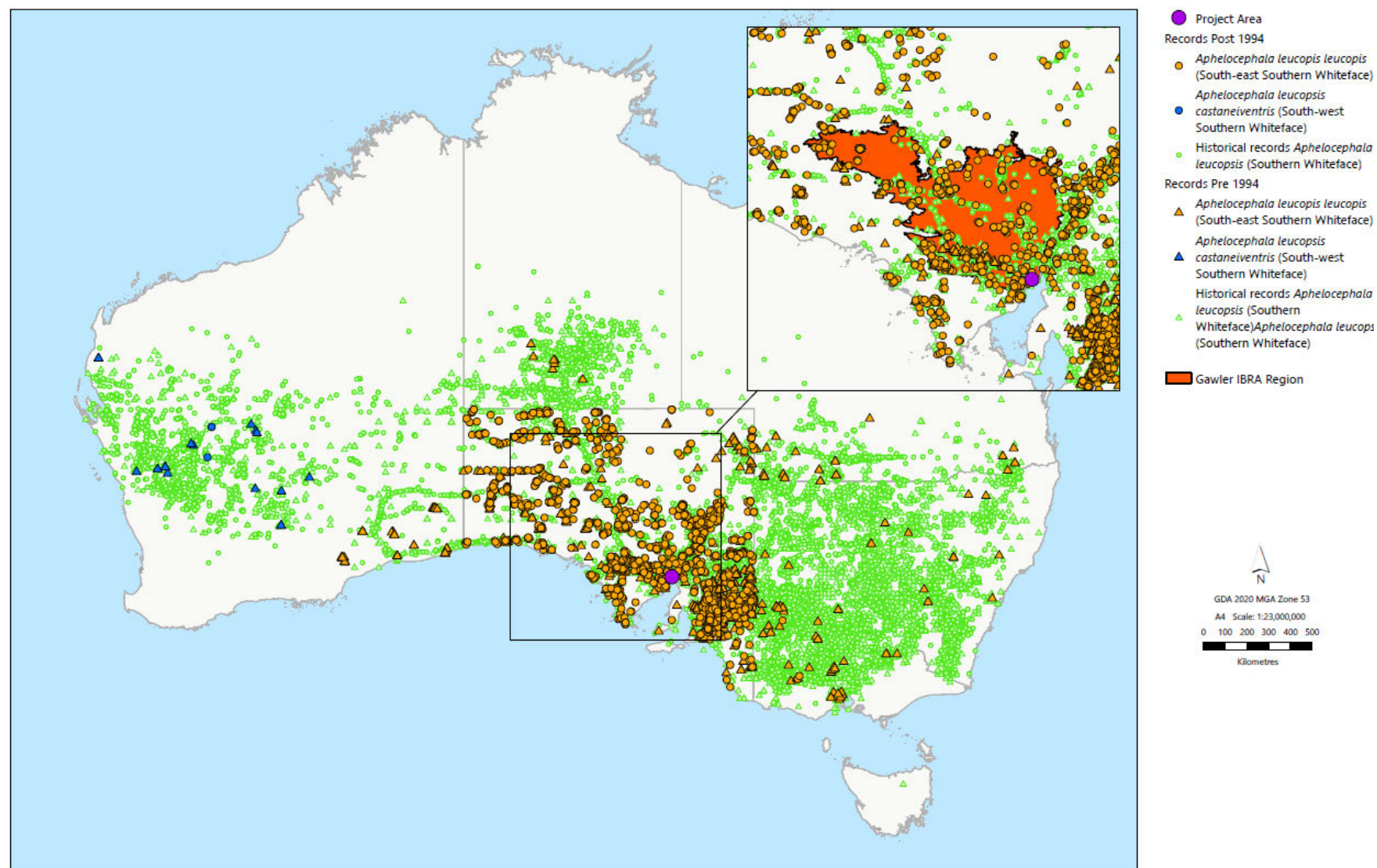


Figure 7-3: Southern Whiteface extent of occurrence (source: Lathwida 2024a)



Figure 7-4: Conservative habitat mapping for Southern Whiteface and records around the Project Area (Lathwida 2024a)

7.3 Malleefowl (*Leipoa ocellata*)

7.3.1 Conservation listing

Commonwealth Classification

The Malleefowl (*Leipoa ocellata*) was listed as Vulnerable under the EPBC Act on 16 July 2000 (DCCEEW 2024b).

State Classification

Malleefowl has not been assigned a conservation classification in South Australia under the *National Parks and Wildlife Act 1971*.

IUCN Red List Classification

Leipoa ocellata has been assessed by *International Union for Conservation of Nature (IUCN) Red List of Threatened Species* in 2016 where it is listed as 'Vulnerable'.

The Action Plan for Australian Birds 2020 categorises *Leipoa ocellata* as 'Vulnerable'.

7.3.2 Occurrence of Malleefowl in the Project area

The following description is adapted from Lathwida (2024a).

Malleefowl is a large ground-dwelling bird found mostly in mallee-dominated shrublands and low woodlands in the southern half of Australia (DCCEEW 2024b). Within South Australia, the majority of records of the species are from the Eyre Peninsula and Murray Darling Basin region. Critical habitat is semi-arid to arid shrublands and low woodlands (especially those dominated by mallee and/or Acacias). Sandy soils and abundance leaf litter are required for breeding (Benshemesh 2007). Densities of birds are greatest in areas of higher rainfall and on more fertile soils where shrub diversity is greatest (Benshemesh 2007). No specific important populations have been defined for the species, but all populations and areas occupied by Malleefowl are considered equally important for the species recovery (Benshemesh 2007, DCCEEW 2024b). The species Extent of Occurrence is shown in Figure 7-5.

Malleefowl is known to occur in the Project area, particularly in mallee habitat along Point Lowly Road where three of the BDBSA records (from 2019) relate to Malleefowl crossing Port Bonython Road and one was feeding near a drainage culvert after crossing (DEW 2024).

No Malleefowl mounds have been detected in the disturbance footprint in targeted surveys and LiDAR data analysis followed up by ground-truthing. Given the lack of deeper sand in the Project Area and proximity to Port Bonython Road, nests are more likely to occur north of Port Bonython Road in the large patch (2870 ha) of Mallee on Defence land, that is contiguous with the Project Area. It is noted the mallee in this region is long unburnt (DEW 2024).

7.3.3 Suitable habitat in the Project Area

Highly conservative habitat mapping is provided in Figure 7-6 showing the extent of suitable habitat for the species across the Project area. Some of this mapped habitat includes transition vegetation such as mallee with low woodlands of False Sandalwood, Bullock Bush, and sclerophyll shrubs, and tall coastal shrubland on low dunes that would also be suitable for Malleefowl foraging.

Within the potential disturbance area, the habitat is only considered suitable as foraging habitat for Malleefowl due to presence of stony ground and very sparse leaf litter.

Construction of the Project will require clearing of up to 28 ha of suitable Malleefowl habitat (primarily foraging) as shown in Table 7-3. Over 99% of this habitat will be rehabilitated following construction.

Table 7-3: Malleefowl habitat in the disturbance footprint (estimated worst case)

Habitat suitability	Total new disturbance (ha)	Operational disturbance footprint (ha)
Suitable (mallee), primarily foraging	25.58	
Coastal tall shrubland, primarily foraging	0.44	
Mixed shrublands in ephemeral drainage lines	1.44	
Unsuitable (Chenopod / samphire shrublands)		0.16
Total		

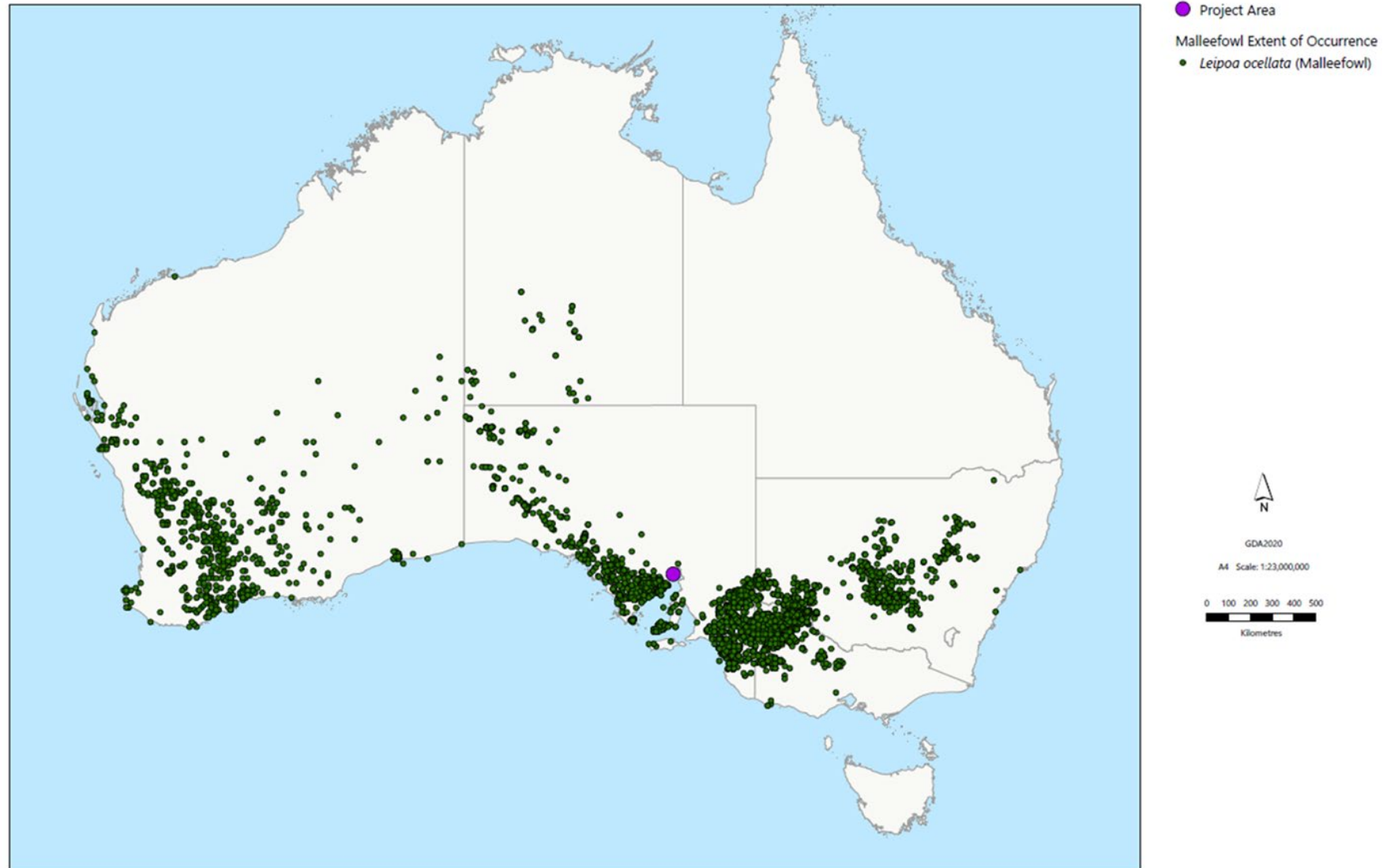


Figure 7-5: Malleefowl extent of occurrence (Lathwida 2024a)



Figure 7-6: Conservative habitat mapping for Malleefowl and previous records (Lathwida 2024a)

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8. Summary of potential risks and impacts to threatened species

An assessment of relevant impacts and risks was undertaken for the Project and reported in the preliminary documentation (JBS&G and Epic Energy 2024). This is summarised in Table 13.

Action		Summary description	Direct/ indirect impact to MNES
1	Clearance of native vegetation	Clearing of native vegetation is required to enable construction of WHP facility and associated infrastructure. The clearance will temporarily remove 76 ha of habitat (35 ha suitable, 41 ha low suitable) for the EPBC-listed Vulnerable Western Grasswren, 84 ha of habitat for the Southern Whiteface and 28 ha for the Malleefowl. Following construction, all of the footprint will be revegetated other than 0.16 ha.	Direct
2	Surface water management	Changes to surface water flows and quality in the proposed action area from construction and operational/maintenance activities which may impact on habitat of listed threatened species.	Indirect
3	Human and vehicle disturbance	Increased human and vehicles disturbance within the proposed action area from construction and operational/maintenance activities, which may impact on threatened species.	Indirect
4	Noise	Noise will be generated from construction, operation and maintenance of the WHP facility.	Indirect
5	Dust	Increased dust in the proposed action area from construction and operational/maintenance activities which may impact on habitat of listed threatened species.	Indirect
6	Weeds	Increased weeds in the proposed action area from construction and operational/maintenance activities which may impact on listed threatened species.	Indirect
7	Pest animals	Increased pest animals in the proposed action area from construction and operational/maintenance activities which may impact on listed threatened species.	Indirect
8	Lighting	Lighting at the primary facility for safety and security purposes during night-time may impact on habitat and listed threatened species.	Indirect
9	Fire	Sparks from some construction activities could cause a fire with resultant impact on habitat for listed threatened species as could a major incident during operation of the WHP.	Indirect
10.	Fauna entrapment	There is potential for ground-dwelling fauna to fall into the open trench during construction and become trapped.	Direct

9. Mitigation measures

9.1 Risk assessment methodology

The methodology for the risk assessment was based on DCCEE's Guidelines for Environmental Management Plans (DCCEE 2024a). The likelihood of an impact to occur ranges from rare to highly likely and was determined using the likelihood criteria in Table 9-1. The consequence of each impact was rated using the consequence criteria in Table 9-2. Likelihood and consequence were then used to assess the risk of impacts using the risk rating matrix in Table 9-3.

Table 9-1: Likelihood Criteria

Qualitative measure of likelihood	How likely is it that this event/issue will occur after control strategies have been put in place
Highly likely	Is expected to occur in most circumstances.
Likely	Will probably occur during the life of the project.
Possible	Might occur during the life of the project.
Unlikely	Could occur but considered unlikely or doubtful.
Rare	May occur in exceptional circumstances.

Table 9-2: Consequence Criteria

Qualitative measure of consequences	What will be the consequence/result if this issue does occur rating
Minor	Minor incident of environmental damage that can be reversed.
Moderate	Isolated but substantial instances of environmental damage that could be reversed with intensive efforts.
High	Substantial instances of environmental damage that could be reversed with intensive efforts.
Major	Major loss of environmental amenity and real danger of continuing impact(s).
Critical	Severe widespread loss of environmental amenity and irrecoverable environmental damage.

Table 9-3: Risk Rating

	Minor	Moderate	High	Major	Critical
Highly Likely	Medium	High	High	Severe	Severe
Likely	Low	Medium	High	High	Severe
Possible	Low	Medium	Medium	High	Severe
Unlikely	Low	Low	Medium	High	High
Rare	Low	Low	Low	Medium	High

9.2 Risk Assessment and Management Plan

A risk assessment of each of the potential risks identified in Section 8 is presented in the sections below along with management measures to mitigate the risks

9.2.1 Clearance of native vegetation

Outcome	Risk event	Management measures	Project phase	Risk			Outcome measurement criteria	Monitoring	Corrective action
				Consequence	Likelihood	Residual risk			
Construction of the WHP does not result in new clearance of more than 102 ha including a maximum of: <ul style="list-style-type: none"> 35 ha of suitable Western Grasswren habitat, and 41 ha of low suitable habitat 61 ha of suitable Southern Whiteface habitat, and 24 ha of low suitable habitat 28 ha of suitable Malleefowl habitat. 	Construction equipment or vehicles intrude into no-go areas.	<ul style="list-style-type: none"> Geospatial data and mapping used to identify approved clearance area. A walk through will be undertaken with an experienced ecologist, arborist and construction design specialist in order to further reduce the construction right-of-way, where possible, and to assist with demarcation of no – go zones for particularly sensitive areas. Avoid any identified areas of higher density preferred chenopod/spiny shrublands, where practicable. Prior to vegetation clearance, the approved disturbance footprint will be clearly delineated to ensure that no disturbance occurs outside of the approved area. All vehicle and machinery parking, laydown areas and stockpiles will be restricted to designated areas within the Disturbance Footprint. All personnel will be inducted as to the locations of sensitive vegetation and threatened species habitat. Construction contractor to operate strictly under an Epic Energy approved CEMP, that includes clearing procedures. 	Pre-construction and Construction	High	Unlikely	Medium	Geospatial data and mapping confirm that habitat clearance is within the limits specified in the outcome.	Environmental contractor to undertake weekly inspection of vegetation clearing.	Over-clearing is reported to Epic Energy and rehabilitation measures developed in consultation with DEM and DCCEEW.
Temporary loss of habitat for Western Grasswren, Southern Whiteface and Malleefowl is minimised to the extent reasonably practicable for construction and operation of the WHP	Vehicle access tracks are poorly planned	<ul style="list-style-type: none"> Existing tracks will be utilised as far as practicable New vehicle access tracks will be planned to minimise their number, width and total length. 	Pre-construction	Moderate	Unlikely	Low	Track locations reviewed by suitably qualified consultant to confirm impacts cannot be further reduced while meeting function and safety requirements.	Pre-construction review report by suitably qualified environmental contractor	Unnecessary tracks rehabilitated.

Outcome	Risk event	Management measures	Project phase	Risk			Outcome measurement criteria	Monitoring	Corrective action
				Consequence	Likelihood	Residual risk			
	Vegetation clearance results in loss of hollows that could be used by Southern Whiteface.	<ul style="list-style-type: none"> Areas of vegetation being removed will be surveyed for hollow bearing trees prior to clearing. Hollow-bearing trees will be mapped and clearly marked in the field. Where the removal of a hollow-bearing tree is required, the hollows will be retained on site or shifted to nearby locations outside of the disturbance area to provide ongoing available nesting habitat for Southern Whiteface (and other fauna). Epic Energy to implement a hollow replacement program through the provision of appropriately sized and orientated nesting boxes for Southern Whiteface in adjacent areas for all hollow bearing trees which are inadvertently destroyed during site clearance. 	Pre-construction and Construction	Moderate	Possible	Medium	Survey report completed. Suitably qualified consultant confirms all hollows have been retained on site, or shifted to adjacent areas where they can persist. Nesting boxes established for any hollows lost.	Post-clearance audit report by suitably qualified ecologist.	Corrective actions as agreed by DEW and DCCEEW, which could include provision of more nesting boxes.
	Revegetation fails on areas that are planned for rehabilitation following construction.	<ul style="list-style-type: none"> Topsoil and vegetative material stockpiled for use in revegetation. Areas designated for rehabilitation have topsoil spread and ground scarified to retain surface moisture and organic materials. Vegetative materials placed over ground designated for rehabilitation to expediate natural regeneration and provide organic materials to soils. Areas for rehabilitation seeded using seed from nearby areas with species selection consistent with the vegetation community cleared. 	Construction and revegetation	Moderate	Possible	Medium	Construction contractor to have a Rehabilitation Management Plan approved by Epic Energy including, rehabilitation targets and recommendations for different vegetation types.	Monitoring of regeneration by a suitably qualified environmental contractor on a quarterly basis until a vegetative cover has been successfully established, then annually until habitat restoration is deemed successful under criteria specified in the Rehabilitation Management Plan.	Corrective action to be developed by appropriately qualified ecologist/contractor and could include further site preparation and seeding with locally indigenous species.
Vegetation clearance during construction does not cause death or injury to Western Grasswren, Southern Whiteface or Malleefowl	Vegetation clearance causes death or injury to Western Grasswren, Southern Whiteface or Malleefowl	<ul style="list-style-type: none"> Progressive clearing of all areas to allow fauna time to disperse into surrounding habitat following disturbance. Pre-clearance survey of the working area by a qualified ecologist prior to any clearing and grading activities where those activities are due to take place during the breeding season for Western Grasswren or Southern Whiteface (late June to October) to survey the area for evidence of the species and implement measures where practicable to minimise disturbance (e.g. reducing the width of the construction right of way near potential nest locations, presence of a 	Construction	Moderate	Unlikely	Low	No injuries or deaths to fauna detected	Monitoring by suitably qualified ecologist during clearing operations	Any injuries or deaths reported to DEW and DCCEEW. Fauna expert to advise if any changes are needed to the staging of clearance.

Outcome	Risk event	Management measures	Project phase	Risk			Outcome measurement criteria	Monitoring	Corrective action
				Consequence	Likelihood	Residual risk			
		qualified ecologist / fauna handler to ensure any birds present are dispersed or relocated). <ul style="list-style-type: none"> Pre-clearance surveys in mallee that cannot be avoided to detect any active or non-active Malleefowl nests, and undertake adaptive mitigation to avoid impacts to Malleefowl, if required (e.g. establish no go areas, relocate live Malleefowl or eggs in collaboration with DEW staff and in accordance with legislative requirements). 							

9.2.2 Surface water management

Outcome	Risk event	Management measures	Project phase	Risk			Outcome measurement criteria	Monitoring	Corrective action
				Consequence	Likelihood	Residual risk			
No adverse impact on habitat for Western Grasswren, Southern Whiteface or Malleefowl outside the temporary Disturbance Footprint due to changes in surface water flows or quality during construction or operation of the WHP	Civil works cause a change in surface water flows	<ul style="list-style-type: none"> Ground surface contours and drainage profiles along pipeline alignment will be reinstated following construction Stormwater system at compressor (HJP) site has been designed to retain existing surface water flow regime 	Pre-construction and construction and operation	Moderate	Unlikely	Low	Audit by suitable environmental contractor confirms all works meet the design specifications	Post-construction audit by suitably qualified environmental contractor	Remedial action as recommended by a suitably qualified environmental contractor
	Soil disturbance during construction results in erosion and sedimentation.	<ul style="list-style-type: none"> Construction contractor to have a Sedimentation, Erosion and Drainage Management Plan approved by Epic Energy. Induct all site personnel to provide an understanding of the issues associated with surface water and the management zones and strategies in place. Install and maintain erosion and sediment control structures in accordance with the CEMP (e.g. berms or drains on slopes leading to watercourses or surface water features; contour banks, silt fences and / or hay bales for interim on-site erosion control) Limit the period between clear-and-grade and restoration to the minimum practicable Promote rapid restoration by conserving and re-spreading topsoil and ripping / scarifying compacted areas where necessary to facilitate vegetation growth. Implement appropriate physical and biological stabilisation and site 	Pre-construction and construction	Moderate	Possible	Low	Inspection by suitably qualified environmental contractor confirms compliance with the Erosion and Sediment Control Plan	Weekly inspection by suitably qualified environmental contractor	If needed corrective actions to be identified by a suitably qualified environmental contractor.

Outcome	Risk event	Management measures	Project phase	Risk			Outcome measurement criteria	Monitoring	Corrective action
				Consequence	Likelihood	Residual risk			
		rehabilitation measures in accordance with the CEMP <ul style="list-style-type: none"> • Leave periodic breaks in any crown left over the trench, to prevent channelling of run-off along the right-of-way. • During periods of heavy rainfall, suspend all activities likely to result in erosion and sedimentation if their effects cannot be adequately controlled 							
	Soil disturbance at watercourse crossing during construction results in erosion and sedimentation.	<ul style="list-style-type: none"> • Ensure that all necessary approvals are in place (including Landscape South Australia Act permits for water affecting activities, if required) • Complete watercourse crossings in the shortest time practicable • Rehabilitate crossing points and banks as soon as possible after works have been completed • Avoid watercourse crossing works during periods of flood or heavy rainfall • Avoid the stockpiling of materials in watercourses / drainage lines • Carry out grading and trenching across watercourses immediately prior to pipe laying, that is, after the pipe is welded and watercourse crossing site prepared. 	Pre-construction and construction	Moderate	Possible	Low	Inspection by suitably qualified environmental contractor confirms compliance with the Erosion and Sediment Control Plan	Weekly inspection by suitably qualified environmental contractor	If needed corrective actions to be identified by a suitably qualified environmental contractor.
	Unexpected find of contaminated soils resulting in mobilisation of polluted soils/water.	<ul style="list-style-type: none"> • Stop work in the event of encountering potentially contaminated soil and reassess site drainage to ensure sediments from potentially contaminated soils are contained. 	Construction	Moderate	Unlikely	Low	Audit by a suitably qualified environmental contractor confirms contaminated soils have been appropriately managed to present a low risk to fauna habitat.	If contaminated soils are found, the need for any monitoring to be determined by a suitably qualified environmental contractor	If required, to be determined by a suitably qualified environmental contractor.

Outcome	Risk event	Management measures	Project phase	Risk			Outcome measurement criteria	Monitoring	Corrective action
				Consequence	Likelihood	Residual risk			
	Spills or leaks of fuel, oil or chemicals resulting in impacts on surface water quality.	<ul style="list-style-type: none"> Implement measures for fuel, oil and chemical management, spill prevention, response and clean-up, trench dewatering, hydrotest water disposal and management of contaminated water Avoid vehicle refuelling in close proximity to watercourses. 	Construction	Moderate	Unlikely	Low	All spills greater than 20 L are investigated by a suitably qualified environmental contractor and remedial actions developed. Audit by a suitably qualified environmental contractor confirms contaminated soils have been appropriately remediated to present a low risk to fauna habitat.	Initial investigation by suitably qualified environmental contractor within 48 hours of the spill. Further monitoring requirements to be determined by a suitably qualified environmental contractor.	If required, to be determined by a suitably qualified environmental contractor.

9.2.3 Human and vehicle disturbance

Outcome	Risk event	Management measures	Project phase	Risk			Outcome measurement criteria	Monitoring	Corrective action
				Consequence	Likelihood	Residual risk			
No measurable adverse impact on Western Grasswren, Southern Whiteface or Malleefowl outside the Disturbance Footprint due to vehicle movement or presence of humans during construction or operation of the WHP.	Unauthorised access to site causes disturbance to Western Grasswren, Southern Whiteface or Malleefowl.	<ul style="list-style-type: none"> Access points and tracks will be fenced where they intersect with public roads with access restricted by locked gates where possible and only with landholder agreement. 	Pre-construction, construction and operation	Moderate	Possible	Medium	An investigation by a suitably qualified environmental contractor confirms that the unauthorised access to the site could not have been reasonably prevented	Incident investigation by suitably qualified environmental contractor within 14 days of the incident, or a timeframe otherwise agreed with DCCEEW	Incident investigation to confirm if any additional measures are needed to prevent unauthorised access
	Vehicles accidents cause death or injury to Western Grasswren, Southern Whiteface or Malleefowl	<ul style="list-style-type: none"> Speed limits will be imposed on all access roads and within the Project Area. Maintain log of incidents involving fauna injury/death resulting from construction activities. Vehicle movements at night minimised. 	Construction and operation	Moderate	Unlikely	Low	An investigation by a suitably qualified environmental contractor confirms that the vehicle accident could not have been reasonably prevented	Incident investigation by suitably qualified environmental contractor within 14 days of the incident, or a timeframe otherwise agreed with DCCEEW	Incident investigation to confirm if any additional measures are needed to prevent unauthorised access

9.2.4 Noise

Outcome	Risk event	Management measures	Project phase	Risk			Outcome measurement criteria	Monitoring	Corrective action
				Consequence	Likelihood	Residual risk			
No measurable adverse impact on Western Grasswren, Southern Whiteface or Malleefowl outside the Disturbance Footprint due to noise from construction of the WHP.	Construction equipment does not operate within specifications	<ul style="list-style-type: none"> Low noise equipment selected where practicable. All vehicles and equipment will be appropriately serviced and maintained. Broadband or directional reversing beepers used. Laydown yard located away from good quality habitat for EPBC-listed fauna species. Construction contractor to operate strictly under an Epic Energy approved CEMP, that includes construction procedures. 	Pre-construction and construction	Moderate	Unlikely	Low	Suitably qualified environmental contractor confirms that construction equipment is operating within specifications and that construction noise is as low as reasonably practicable	Fortnightly inspection by a suitably qualified environmental contractor during the construction period.	CEMP reviewed to identify any additional measures that could be reasonably applied.

9.2.5 Dust

Outcome	Risk event	Management measures	Project phase	Risk			Outcome measurement criteria	Monitoring	Corrective action
				Consequence	Likelihood	Residual risk			
No decline in habitat quality for the Western Grasswren, Southern Whiteface or Malleefowl outside the Disturbance Footprint due to smothering of vegetation in dust from construction of the WHP.	Poor dust management during construction cause vegetation smothering.	<ul style="list-style-type: none"> Prevent excessive dust generation using water sprays and other sediment suppression and erosion controls. Ensure vehicle loads are covered to prevent escape of materials. Limit vehicle speeds on access tracks and the right-of-way. Stop work in areas where construction activities are generating unacceptable levels of dust if the effects cannot be adequately controlled. Induct site personnel to provide an understanding of the issues associated with air quality management and the mitigating strategies in place. Construction contractor to operate strictly under an Epic Energy approved CEMP, that includes construction procedures and a Dust Management Plan (DMP). 	Construction	Minor	Possible	Low	Inspection of vegetation adjoining Disturbance Footprint by a suitably qualified environmental contractor identifies no evidence of dust smothering	Monthly inspection during the construction phase by a suitably qualified environmental contractor	Additional dust mitigation measures applied if determined necessary by suitably qualified environmental contractor. This could include an increase in the frequency of watering exposed areas with a water cart.

9.2.6 Weeds, pathogens and pest animals

Outcome	Risk event	Management measures	Project phase	Risk			Outcome measurement criteria	Monitoring	Corrective action
				Consequence	Likelihood	Residual risk			
No introduction of new weeds, pathogens or pest animals, nor sustained increase in abundance of existing weeds, pathogens or pest animals, in areas adjoining the Disturbance Footprint due to construction or operation of the WHP	Introduction of weeds, pathogens or pest animals on construction equipment and vehicles	<ul style="list-style-type: none"> Baseline weed surveys undertaken prior to construction. Construction contractor to have a Weed, Pest and Disease Management Plan (including Phytophthora) approved by Epic Energy. Prepare factsheets of weed and pest species for dissemination to contractors. Induct all site personnel to provide an understanding of the declared plants present onsite and requirements of the <i>Landscape South Australia Act 2019</i>. Limit entry/exit points to the Project Area to the minimum number possible. Clearly delineate designated entry and exit points to avoid traffic movements outside of these locations. Inspect all vehicles and plant to ensure that they are weed free prior to their initial commencement of works, and conduct washdowns where required. Designate/establish vehicle and machinery washdown and inspection sites. Ensure that any construction machinery is clean and free from soil and any plant materials before entering the area. This includes performing appropriate hygiene before entering and leaving the project area to avoid potential spread. Heavy vehicles/machinery must be certified weed and soil free by the responsible officer prior to entering the Project Area. Implement weed monitoring targeting Weeds of National Significance and Declared Weed species (including Buffel Grass), with follow up controls as required for any identified weed outbreaks. 	Pre-construction, construction and operation	Moderate	Unlikely	Low	A survey by a suitably qualified ecologist confirms there has been no introduction of new weeds, pathogens or pest animals, nor sustained increase in abundance of existing weeds, pathogens or pest animals, in areas adjoining the Disturbance Footprint.	Survey undertaken every six months by a suitably qualified ecologist during construction and annually during operation until a stable state can be demonstrated.	Weed, pathogen or pest animal controls to be developed and implemented by a suitably qualified environmental contractor as needed
	Fill material brought onto site contains weeds or pathogens.	<ul style="list-style-type: none"> Ensure all fill materials (e.g. sand, aggregate) imported to site are sourced from weed and pathogen free sites 	Pre-construction and construction	Moderate	Unlikely	Low	All fill material is appropriately certified as weed and pathogen free.	Monthly check of records by a suitably qualified environmental contractor confirms all fill brought to site has	If fill is not appropriately certified, suitably qualified environmental contractor to undertake sampling to identify if weeds or

Outcome	Risk event	Management measures	Project phase	Risk			Outcome measurement criteria	Monitoring	Corrective action
				Consequence	Likelihood	Residual risk			
								the appropriate certification.	pathogens are present. Control measures to be implemented as advised by the suitably qualified environmental contractor.
	Pest animals attracted by putrescible waste on site.	<ul style="list-style-type: none"> Work areas to be maintained in a neat and orderly manner. Waste will be appropriately stored to discourage pest animals. This includes covering putrescible and organic storages associated with crib rooms and offices. Waste will be disposed of regularly by the persons/organisation undertaking the activities, with appropriate signage and separation of hard organic material from putrescible organic material. Off-site waste disposal will be in accordance with SA EPA and Zero Waste SA guidelines/requirements. Construction contractor will have a Waste Management Plan approved by Epic Energy. 	Construction	Minor	Possible	Low	Site inspection confirms all waste is managed in accordance with the Waste Management Plan	Monthly inspection by a suitably qualified environmental contractor	Monthly inspection to identify and rectification measures if needed

9.2.7 Lighting

Outcome	Risk event	Management measures	Project phase	Risk			Outcome measurement criteria	Monitoring	Corrective action
				Consequence	Likelihood	Residual risk			
No measurable adverse impacts on Western Grasswren, Southern Whiteface or Malleefowl due to lighting at the WHP during construction or operation	Lighting is not installed or operated in accordance with required specifications.	<ul style="list-style-type: none"> Lighting designed to be shielded and directional. Designed for access for vehicles and personnel, and for security. All lighting will be designed to Australian Standards (AS/NZS 1158 & AS/NZS1680) and applicable laws and regulations, consistent with DCCEE's National Light Pollution Guidelines for Wildlife 2023. 	Construction	Moderate	Unlikely	Low	An inspection by a suitably qualified contractor confirms lighting is in accordance with the required specifications	One-off inspection by a suitably qualified contractor following installation of new lighting	As advised by the suitably qualified contractor

9.2.8 Fire

Outcome	Risk event	Management measures	Project phase	Risk			Outcome measurement criteria	Monitoring	Corrective action
				Consequence	Likelihood	Residual risk			
No adverse impacts on habitat for Western Grasswren, Southern Whiteface or Malleefowl due to fires caused by construction or operation of the WHP that could have been reasonably prevented	Construction or maintenance activities cause fire ignition	<ul style="list-style-type: none"> Construction contractor to have a Bushfire Management Plan (including Lightning Management Plan) approved by Epic Energy. All contractors accessing Project Area will carry basic firefighting equipment (including fire extinguisher) along with communications devices in all vehicles during construction activities. Hot works will only occur on days of total fire ban under appropriate permit, in compliance with the documented plan and regulations. Restrictions will be in place on catastrophic rating days. Contractors' work safety documentation will include emergency response procedures for the event of fire. Personnel will be informed of daily South Australian Country Fire Service (CFS) Fire Danger Rating at daily toolbox meetings. The Fire Danger Rating will form part of the daily risk analysis at these meetings. Any incidents of unplanned ignition will be immediately (or as soon as practicable) reported to the CFS and Epic Energy. Procedures relating to fire management in the Project Area, including contact details of relevant authorities (e.g. CFS) and information sources, will be clearly communicated to all personnel during inductions. 	Construction and operation	Major	Rare	Medium	An investigation by a suitably qualified contractor confirms that the fire could not have been reasonably prevented	Investigation by a suitably qualified contractor completed within 30 days of any incident	Additional fire prevention measures implemented if recommended by the investigation by a suitably qualified contractor

9.2.9 Fauna entrapment

Outcome	Risk event	Management measures	Project phase	Risk			Outcome measurement criteria	Monitoring	Corrective action
				Consequence	Likelihood	Residual risk			
No measurable adverse impacts on Western Grasswren or Malleefowl due to fauna entrapment in trenches during construction	Ground-dwelling fauna could fall into the trench and become trapped and exposed to overheating, dehydration, predation and / or drowning.	<ul style="list-style-type: none"> Minimise (as far as practicable) the amount of time the trench is open Install trench plugs with slopes no greater than 50% at regular intervals to provide ramps for fauna to exit the trench Install measures to minimise fauna fatality in the trench and allow fauna 	Construction	Moderate	Unlikely	Low	No deaths of EPBC-listed threatened species due to fauna entrapment	Daily inspection of open trenches during construction by a suitably qualified environmental contractor	More frequent spacing of identified measures to minimise fauna fatality or other measures as determined by a suitably qualified environmental contractor

Outcome	Risk event	Management measures	Project phase	Risk			Outcome measurement criteria	Monitoring	Corrective action
				Consequence	Likelihood	Residual risk			
		<div>to exit the trench (e.g. sawdust filled hessian sacks soaked in water, branches or ramped gangplanks)</div> <ul style="list-style-type: none">• Welded pipe strings will be end capped to prevent fauna entry• Undertake daily inspection of open trenches during the working cycle• Ensure presence of appropriately trained (and licensed) fauna handlers during construction to assist with removal of, and relocation of, any trapped (and/or injured) fauna displaced during vegetation clearance activities.							

9.3 Environmental monitoring program

This section describes environmental monitoring specific to minimising and avoiding impacts on EPBC-listed threatened species. In addition, key characteristics of operations that can have a significant environmental impact are included in the Epic Energy Environmental Monitoring Program. The characteristics to be monitored are based on significant environmental aspects as per the risk assessment process, or regulatory requirements. The objectives of the monitoring program are:

- to assist in demonstrating compliance with regulatory requirements
- to measure performance against the Environmental Policy and SEO obligations.

The monitoring program includes:

- Patrols: Regular patrols are undertaken to look for evidence of adverse environmental impacts from operations. The Environmental Advisor is advised of any issues requiring remediation.
- Pre-work checklists: Pre-work checklists are used during excavation activities or land disturbance to ensure compliance with the requirements of internal procedures and work instructions. Copies are provided to the Environmental Advisor, with selected sites included in the Annual Environmental Monitoring Report.
- Monitoring points: Environmental monitoring points are established along pipeline routes to maintain records of:
 - different land systems and environmentally sensitive areas (e.g. vulnerable or actual soil erosion sites) along the route
 - pre-disturbance and post-remediation condition of key areas along the route.

The location and interval for monitoring each of the points is maintained within the GIS database for future reference. A record is maintained of each of the Monitoring Points including a photograph and when the site was visited. Monitoring results are recorded in the Annual Environmental Monitoring Report.

- Groundwater and soil contamination: Consultants are engaged as required, but at a minimum, every five years, to undertake environmental monitoring at Epic Energy facilities to monitor for groundwater contamination, bore water quality, soil contamination and water vapour contamination.

The purpose of the five yearly monitoring is twofold. First being to monitor any identified legacy contamination issues and continue with agreed remedial actions with the second element being to investigate and/or undertake remediation works if any ground and soil contamination issues arise.

- Additional monitoring: Any additional site-specific monitoring requirements for new projects (e.g. resulting from a license or approval condition) are to be documented within a Project specific CEMP following a formal environment impact assessment. This is to include accountabilities, review of results and reporting requirements. Once a pipeline or facility has been commissioned the relevant environmental information in the CEMP is to be included in the OEMP.

9.4 Procedure for managing environmental emergencies

Epic Energy has an incident reporting and investigation process underpinned by the Incident Reporting and Investigation Procedure and managed within Epic's online management system to:

- provide guidance and minimum requirements for incident notification and reporting
- ensure corrective actions have been identified to address each root cause and any other actions required to reinforce immediate controls
- enable final approval of the incident by the responsible manager.

All incidents are managed and recorded online. For non-emergencies, the Manager notifies the Environment Advisor and Risk and Compliance Advisor to determine the requirement for response and to provide relevant information to the regulatory bodies and Epic Energy management as required.

All significant incidents are investigated to identify root causes and/or contributing factors that need to be rectified in order to prevent recurrence.

Following the reporting and investigation of an incident, the relevant Manager is responsible for developing and implementing corrective actions to address the incident in a timely manner.

9.5 Response measures and corrective actions

If monitoring identifies a failure to meet outcome measurement criteria, this will be reported as an environmental incident and an environmental incident investigation will be undertaken to determine the extent and cause and to prevent it from occurring again.

If clearing of habitat occurs outside the Disturbance Footprint, remediation and/or rehabilitation would be undertaken, provided that it does not cause any further adverse impact (such as undesirable soil disturbance).

If injured or dead Western Grasswren, Southern Whiteface or Malleefowl are found, the appropriately qualified ecologist will be notified immediately to investigate and determine the best course of action. The ecologist will be responsible for contacting the Department for Environment and Water (South Australian Government) (DEW) and providing notification of the incident.

If live Western Grasswren and Southern Whiteface or Malleefowl, or populations are discovered in areas of impact (in areas not previously identified as Western Grasswren, Southern Whiteface or Malleefowl habitat), the following actions are to be taken:

- All works will cease in the immediate vicinity until a suitably qualified ecologist provides advice
- The area is designated as Western Grasswren, Southern Whiteface or Malleefowl habitat and the management measures outlined in this Plan are to be implemented
- DEW and DCCEEW to be notified.

10. Audit and review

10.1 Reporting

External reporting will occur following major or reportable incidents and in accordance with any reporting requirements specified as conditions of approval (refer to Section 2). Reports will be endorsed by Epic Energy prior to issue to relevant agencies.

10.2 Environmental auditing

The CEMP will specify auditing to be undertaken during construction, which will capture the auditing requirements outlined in Section 8, as well as more general compliance auditing requirements, which will involve as a minimum two audits during construction and one within three months of completion of construction.

The Epic Energy Environmental Audit Program assesses the implementation and effectiveness of the EMS and the management of significant environmental risks.

Regular inspections of all pipelines and facilities are completed to monitor the effectiveness of the defined control measures in minimising the environmental impacts of the activity.

Environmental compliance audits will be conducted on a recurring basis, so that at least one section of a pipeline is audited annually, with the audit criteria for the WHP based on section **Error! Reference source not found.** of this plan.

Auditors are to be appropriately qualified and experienced in auditing environmental management systems including documentation and implementation. Each auditor shall complete a review of all relevant documentation, prior to undertaking the audit. This shall include the identification of key regulatory requirements, if an assessment of compliance to the requirements is to be included as part of the audit. Reference should also be made to the Compliance Register.

Audit results are to be discussed at the Health Safety and Environment Committee meeting, where the findings and recommendations will be used to determine the corrective actions required. Corrective Actions are managed and recorded online via Epic Energy's CGR system.

10.3 Environmental management plan review

The Environmental Management Plans, including this Threatened Species Management Plan will require regular reviews to ensure they reflect up to date species knowledge and best practice mitigation measures. Reviews will be undertaken by the Principal Contractor during construction and require endorsement by Epic Energy. Post construction, reviews will be undertaken by Epic Energy. Reviews will be undertaken:

- At the completion of construction period (to reflect change in risk profile and transition to from CEMP to OEMP)
- Following a non-compliance with environmental outcomes or a major environmental incident
- Every 5 years during operations, following an environmental audit to incorporate any recommendations from the audit
- Following a significant change in the construction or operation methodology.

External approval of updated EMPs will be required following significant variations in the approved activity as a result of a review by the Federal Environmental Minister or delegate.

11. Contacts

11.1 Emergency contacts

The key emergency contacts responsible for managing environmental emergencies associated with the Project and their contact details are presented in Table 11-1.

Table 11-1: Emergency contacts

• Contact	• Email	• Phone
TBD	TBD	TBD

11.2 Other important contacts

Other important contacts are presented in Table 11-2.

Table 11-2: Important contacts

• Contact	• Email	• Phone
DEW (Fauna Permits Unit)	dewfaunapermitsunit@sa.gov.au	(08) 8124 4972
DEW (Scientific Research Permits)	DEWResearchPermis@sa.gov.au	(08) 8124 4856
DEW (Animal Welfare - Licence for teaching, research or experimentation involving animals)	DEWAnimalWelfare@sa.gov.au	(08) 8207 7731
DCCEEW	TBD	TBD
Wildlife Ethics Committee	DEW.WildlifeEthicsCommittee@sa.gov.au	(08) 8463 6851

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Attachment E Targeted Bird Survey Report (EBS, 2023)

NOTE: This report was published in March 2024 as Attachment C of the **Hydrogen Jobs Plan** EPBC Referral #2023/0975.



Hydrogen Jobs Plan

Targeted Western Grasswren Survey

Hydrogen Jobs Plan - Targeted Western Grasswren Survey

14 December 2023

Version 4

Prepared by EBS Ecology for Office of Hydrogen Power South Australia

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Cover photograph: Photo of vegetation at survey site 20, where Western Grasswren was detected.

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GLOSSARY AND ABBREVIATION OF TERMS

AOO	Area of Occupancy: area within a species' extent of occurrence which is occupied by a species, excluding cases of vagrancy.
BDBSA	Biological Databases of South Australia
cm	Centimetres
CP	Conservation Park
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DEW	Department for Environment and Water (South Australia)
DotE	Department of the Environment (Commonwealth)
EBS	Environmental and Biodiversity Services Pty Ltd, trading as EBS Ecology
EOO	Extent of Occurrence: The area contained within the shortest continuous imaginary boundary that can be drawn to encompass all the known sites of present occurrence of a species, excluding cases of vagrancy.
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
g	Grams
ha	Hectare(s)
HJP	Hydrogen Jobs Plan
IBRA	Interim Biogeographic Regionalisation of Australia
IUCN	International Union for Conservation of Nature
km	Kilometre(s)
MNES	Matter(s) of National Environmental Significance, as defined under the EPBC Act.
OHPSA	Office of Hydrogen Power South Australia
Project	The planning and development of a green hydrogen power station, electrolyser and storage facility, also referred to as the Hydrogen Jobs Plan.
Study Area	The outer boundary of the area proposed containing the HJP site and indicative transmission line alignments (that were current at the time of the survey). The area defined by the red line on all maps in this report.
SA	South Australia/South Australian
Search Area	A 5 km buffer around the Study Area, used in database searches.
sp.	Species (singular)
spp.	Species (plural)
ssp.	Subspecies
SPRAT	Species Profile and Threats Database

EXECUTIVE SUMMARY

The Office of Hydrogen Power South Australia (OHPSA) is progressing with a green hydrogen power station, electrolyser and storage facility, referred to as the Hydrogen Jobs Plan (HJP/the Project) north of Whyalla, in South Australia (SA). Although detailed Project design has not been undertaken, the proposed construction requires the clearing of native vegetation. This has potential to impact on Matters of National Environmental Significance (MNES) which are protected under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

Several ecological constraints associated with the HJP were identified during previous surveys undertaken at the Project site, including potential impacts to the Western Grasswren (Gawler Ranges) (*Amytornis textilis myall*), which is listed as Vulnerable under the EPBC Act. Vegetation surveys and mapping indicate that suitable habitat occurs in the Study Area for the Western Grasswren and previous surveys detected the species within the Study Area in some areas.

EBS Ecology (EBS) was contracted by JBS&G and GPA Engineering on behalf of OHPSA to undertake targeted Western Grasswren surveys within the Study Area, to further extend the knowledge of the occurrence of Western Grasswren and the species' habitat within the Study Area. The information from this report will be used in support of an EPBC Act referral for the Project.

A 3-day targeted bird survey was undertaken in October 2023 utilising methods consistent with Birdlife Australia Systematic Bird surveys (20 min/2 ha) and recommended survey methods as per the *Guidelines for Detecting Birds Listed as Threatened under the EPBC Act*.

Western Grasswrens were recorded at 11 of the 24 survey sites located throughout the Study Area, with a minimum of 23 individuals recorded over the survey period. Western Grasswren were observed by EBS Ecology in 3 out of the 4 broad vegetation associations present within the Study Area. Southern Whiteface (*Aphelocephala leucopsis*), which is listed as Vulnerable under the EPBC Act, was recorded at 7 survey sites located throughout the Study Area, with 16 individuals recorded over the survey period.

All vegetation within the Study Area is deemed suitable for Western Grasswren, with the exception of one small more degraded area of low open woodland of Western Myall with a Chenopod shrub understorey located in the southeastern corner of the Study Area.

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1 INTRODUCTION

1.1 Background

The Office of Hydrogen Power South Australia (OHPSA) is progressing with the planning and development of a green hydrogen power station, electrolyser and storage facility, referred to as the Hydrogen Jobs Plan (HJP/the Project) north of Whyalla, in South Australia (SA). The Project will involve the construction of a 250-megawatt (MW) hydrogen production facility, a 200 MW hydrogen power plant, hydrogen storage and associated infrastructure (including transmission network and water supply). The final location and footprint of these elements are yet to be determined.

Several ecological constraints associated with the HJP were identified during previous surveys, including potential impacts to the Western Grasswren (*Amytornis textilis myall*), which is listed as Vulnerable under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). This species has historical and recent observations and suitable habitat within and surrounding the Study Area.

1.2 The Study Area

Two terms are used throughout this report to describe the location of the HJP. These terms are defined below. The location of each is shown in Figure 1.

- Study Area – the outer boundary of the area containing the HJP site and indicative transmission line alignments (that were current at the time of the survey).
- Search Area – a 5 km buffer surrounding the Study Area.

The Study Area is located within the Whyalla City Council area. The Cultana Training Area and Whyalla Conservation Park (CP) are located in the north of the Study Area on the indicative transmission line alignments, and a Heritage Agreement (which protects native vegetation) borders the west of the Study Area (Figure 1).

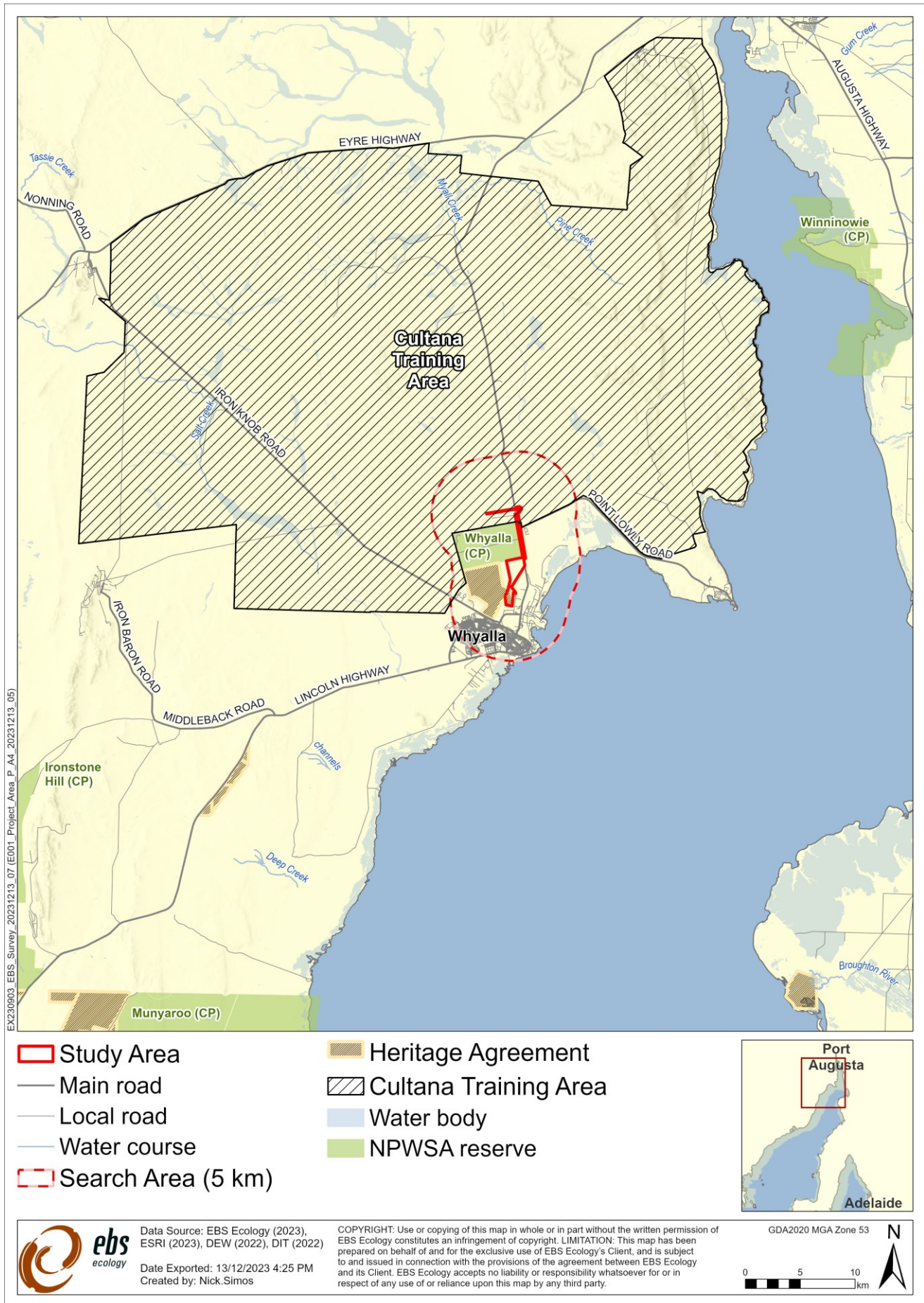


Figure 1. Location of the Study Area.

1.3 Previous work

Since 2021, multiple ecological surveys have been undertaken at the site:

- **Survey 1**, spring 2021 (5-7 October 2021) (Jacobs 2023): A vehicular and foot survey by Jacobs' ecologists was undertaken as part of pre-feasibility planning for the Project to highlight ecological constraints and provide data for broad mapping of vegetation groups, potential threatened species habitat and potential land management issues.
- **Survey 2**, spring 2022 (5-13 October 2022) (Jacobs 2023): Vegetation surveys and targeted EPBC Act listed species (including bird surveys, and Song Meter deployment) and communities habitat surveys were undertaken by Jacobs' ecologists;
- **Survey 3**, summer 2022 (5-9 December) (Jacobs 2023): Follow up surveys were undertaken by Jacobs' ecologists to gap fill vegetation and habitat surveys, including bird surveys, and Song Meter deployment; and
- **Survey 4**, summer 2023 (21-22 February) (Jacobs 2023): Follow up surveys were undertaken by Jacobs' ecologists to gap fill vegetation and habitat survey data.

Western Grasswrens were observed within the Study Area in 2022 during a Spring flora and fauna survey and subsequent vegetation surveys (Jacobs 2023) (see Figure 2). The Hydrogen Jobs Plan – Site 1 Terrestrial Ecological Assessment states that *“the Study Area provides known high quality habitat for Western Grasswren with a number of individuals seen or heard across the site.”* (Jacobs 2023).

Within the Study Area 6-7 Western Grasswrens were recorded at one site, and another single individual was observed at another site. Western Grasswren were heard at two other sites: one site along the Eastern boundary of the Study Area, and one west of water tanks that are located in the south western corner of the Study Area, as detailed in Jacobs (2023).

1.4 Objectives

EBS Ecology (EBS) was contracted by JBS&G and GPA Engineering on behalf of OHPSA to undertake targeted Western Grasswren surveys within the Study Area, to further extend the knowledge of the occurrence of Western Grasswren and the species' habitat within the Study Area. The information from this report will be used in support of an EPBC Act referral for the overall Project.

The overall objective of the targeted Western Grasswren survey was to extend the knowledge of the occurrence of Western Grasswrens in the Study Area.

The scope of works included the following:

- Undertake a brief desktop assessment to assess the occurrence of previous Western Grasswren records within the Search Area to be used to inform the field assessment and survey design of the targeted Western Grasswren survey.

- Undertake targeted avian surveys within the Study Area (as per the *Survey guidelines for Australia's threatened birds – Guidelines for detecting birds listed as threatened under the Environment Protection and Biodiversity Conservation Act 1999*, (DEWHA 2010)) to collect additional information on the occurrence of Western Grasswrens and their habitat within the Study Area.
- Prepare a report with the findings of the desktop assessment and survey results.

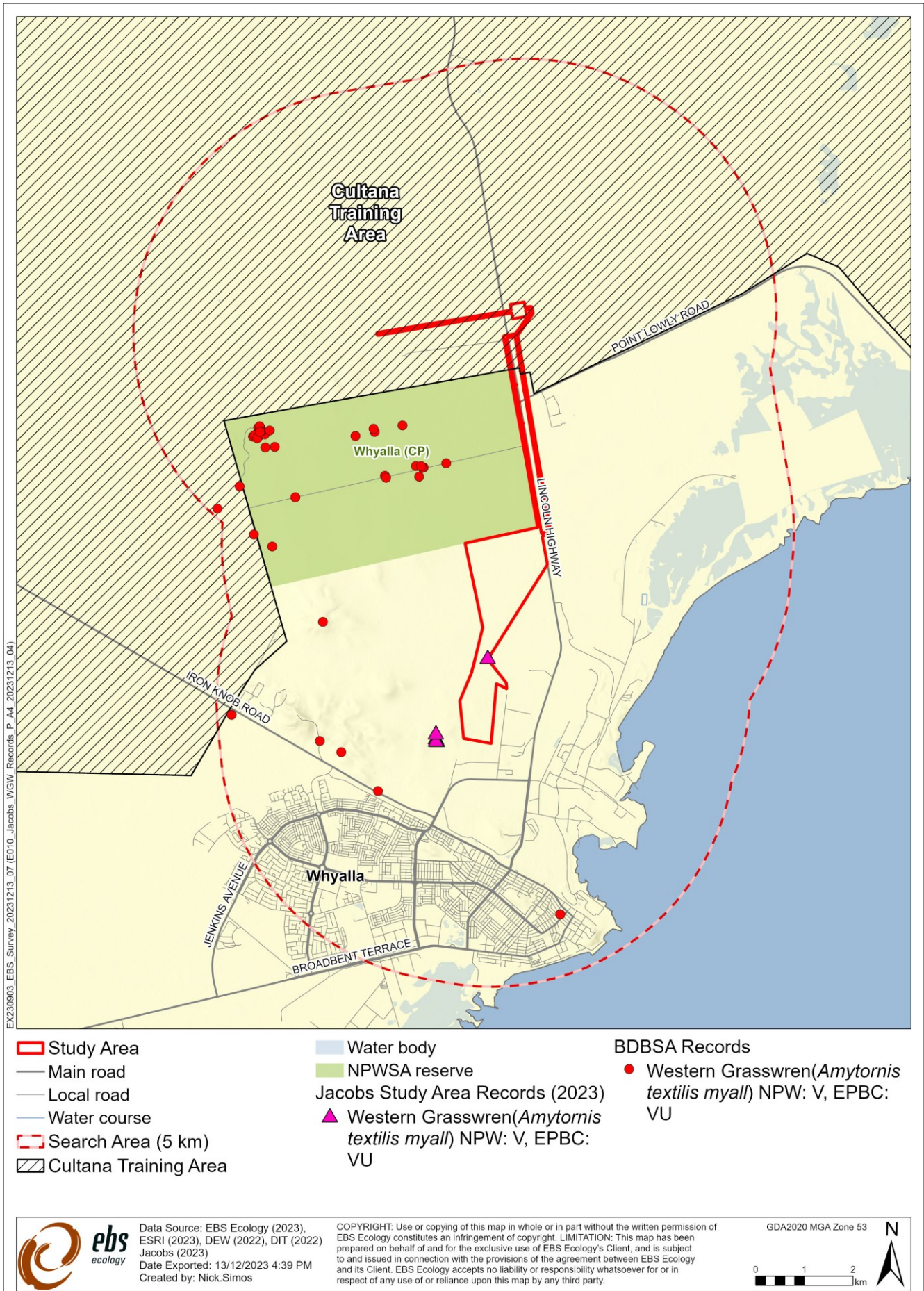


Figure 2. Biological Database of South Australia (BDBSA) records within the Search Area and Western Grasswren field records collected by Jacobs (2023) within and surrounding the Study Area.

2 METHODS

2.1 Desktop Assessment

A variety of Project documents, previous reports, scientific papers and data have been reviewed in the preparation of this report, including (but not limited to):

- Review of publicly available literature, including the Species Profile and Threats Database (SPRAT), species recovery plans and Threatened Species Scientific Committee (TSSC) notes.
- Black, A.B., Carpenter, G., and L. Pedler (2009). Distribution and habitats of the Thick-billed Grasswren *Amytornis textilis* subspecies *myall*.
- Black, A.B., Carpenter, G., and L. Pedler (2011). Distribution and habitats of the Thick-billed Grasswren *Amytornis modestus* and comparison with the Western Grasswren *Amytornis textilis myall* in South Australia.
- Black, A.B., Gower, P. (2017). *Grasswrens Australian Outback Entities*. Publisher Axiom Distributors Pty. Ltd.
- Department of the Environment (DotE). (2014). Conservation Advice *Amytornis textilis myall* western grasswren (Gawler Ranges).
- Garnett, S.T., Szabo, J.K., Dutson, G. (eds) (2011). *The action plan for Australian birds 2010*. CSIRO Publishing, Collingwood, Victoria, Australia.
- Garnett, S.T., Baker, G.B (eds) (2021). *The action plan for Australian birds 2020*. CSIRO Publishing, Melbourne, Australia.
- Magrath, M., Weston, M., Olsen, P., Antos, M. (2010). Guidelines for Detecting Birds Listed as Threatened under the *Environment Protection and Biodiversity Conservation Act 1999*.
- Owens, H. (2000). Department of Environment and Water (DEW) biological survey methods.

Other relevant Department of Climate Change, Energy, the Environment and Water (DCCEEW) Conservation Advice documents, as well as Biological Database of South Australia (BDBSA) and EBS Ecology records were reviewed to inform the assessment process.

2.2 Field survey

The targeted survey undertaken in October 2023 was conducted utilising methods consistent with Birdlife Australia Systematic Bird surveys (20 min/2 ha) (Birdlife 2023a), recommended survey methods (as per the Guidelines for Detecting Birds Listed as Threatened under the *Environment Protection and Biodiversity Conservation Act 1999* (DEWHA 2010 – see Appendix 1) and Department of Environment and Water (DEW) biological survey methods (Heard and Channon 1997; Owens 2000).

Field surveys were conducted under the following research and ethics permits/licenses held by EBS Ecology:

- Scientific Research Permit No. K25613-23 (Department for Environment and Water (DEW));
- Wildlife Ethics Committee (WEC) Approval No. 27/2022, (Wildlife Ethics Committee); and
- Scientific Licence No. 158 (Animal Welfare, National Parks and Wildlife SA).

2.2.1 Timing of survey

The targeted avian survey was undertaken by two ecologists (Dr M. Louter and E. Tremain) over 3 days, from 3-5 October 2023. The timing of the survey was considered suitable to detect the species at the site, as the species is considered territorial year-round (Higgins *et al.* 2001) and the breeding season is estimated to be around this time (breeding season from June to September). As such Western Grasswrens are expected to be actively guarding territories throughout this period (Black *et al.* 2011).

2.2.2 Climate and weather conditions

The Whyalla weather station (018120) is the nearest weather station with historical climate data for comparative purposes. The weather during the 3-day survey period was variable (Table 1) (BOM 2023). Temperatures recorded during the survey period were relatively cold for the time of year, and ranged from a minimum of 5.4°C on 5 October to a maximum of 23.8°C on 3 October. Strong winds and gusts of up to 54 km/hour were recorded during the survey period, but wind conditions were considered milder in the mornings and afternoons. A total of 9.0 mm of rainfall was recorded over 3 days, but rainfall was locally patchy with isolated light showers on two survey days. Weather conditions were considered suboptimal for avian surveys.

Table 1. Whyalla weather station (018120) daily weather observations during the survey period. Information from BOM (2023).

Date	Min air temp (degrees °C)	Max air temp (degrees °C)	Rainfall (mm)	Max wind gust			9:00 AM			3:00 PM		
				Direction	Speed (km/h)	Time (local)	Temp (degrees °C)	Wind direction	Wind speed (km/h)	Temp (degrees °C)	Wind direction	Wind speed (km/h)
03/10/2023	15.1	23.8	8.6	WNW	52	12:51	16.4	W	11	20.2	SE	17
04/10/2023	9.6	16.5	0.0	S	54	13:28	11.9	SW	26	14.7	S	31
05/10/2023	5.4	18.6	0.4	SSE	31	14:22	13.9	SW	15	17.5	SE	20

2.2.3 Avian surveys

Survey methods consisted of (1) active searches surveys (20 min/2 ha) (Birdlife 2023a) and (2) call playback surveys, as guided by the *Guidelines for Detecting Birds Listed as Threatened under the Environment Protection and Biodiversity Conservation Act 1999* (Appendix 1, for an extract) and Department of Environment and Water (DEW) biological survey methods (Heard and Channon 1997; Owens 2000).

Active searches surveys

Avian surveys were undertaken at each selected survey site to determine presence of the target species Western Grasswren as well as record other avian species. Active searches surveys (20min/2ha) (Birdlife 2021a) were undertaken from 7 am onwards with a focus on early mornings and late afternoons, but surveys continued throughout the day, due to changing weather conditions (rain and windy conditions – see Section 2.2.2). Avian surveys were limited to one survey per site a day, to eliminate the possibility of double counting a particular bird.

All bird species identified during active searches that could be positively identified by sight and/or call, as well as the activity they were engaged in when first observed, were recorded. At each site the following information was recorded for the target species (if present):

- Location (hand-held GPS)
- Detection method (heard and/or seen)
- Number of individuals
- Behaviour:
 - Flying in a single direction;
 - Flying (hovering or circling) over or around a single point;
 - Foraging (feeding) on ground;
 - Perching/resting/walking on ground;
 - Perching/resting/climbing on trees or shrubs; and
 - Foraging on trees or shrubs.

Birds outside of the 2-ha were also recorded as being offsite. In addition to the above data, bird species of conservation concern were recorded opportunistically when observed whilst traversing the site.

A site photo was taken at each bird survey site (Appendix 2).

Call Playback

Call Playback is a recommended survey method for Western Grasswrens (see Appendix 1). Playback surveys were performed with a portable Ultimate Ears Wonderboom 2 Deep speaker (Ultimate Ears) with a frequency range of 75 Hz - 20 kHz connected to an iPhone (Apple Inc., Cupertino, CA) via Bluetooth. The speaker was placed in a low chenopod shrub, concealed in vegetation. Playback was broadcasted for up to 6 minutes at each site, in 3-minute call playback bouts. During the playback the surveyor(s) were positioned approximately 15-20 metres away from the speaker, obscured behind vegetation where possible, to minimise any potential effect of their presence. After the first period of 3 minutes finished, observations, the number of birds, and song/calls of Western Grasswrens were recorded on datasheets. If grasswrens were not detected during the initial 3 minute playback survey, a second 3 minutes of call playback were broadcasted, as there is sometimes a delayed response (M. Louter, personal observation). In addition, a rapid site search was undertaken to assess if birds may have been present, but not responded.

2.2.4 Detectability

Western Grasswren are usually furtive and difficult to observe (DEWHA 2010) as the species is shy and cryptic by nature, has inconspicuous behaviour and has brown partly streaked plumage that enables effective camouflage. Western Grasswren can sometimes climb briefly to a vantage point before disappearing into cover. Their calls and vocalising are soft, high pitched and considered difficult to hear, especially in windy conditions. The species is deemed to probably respond to broadcast (playback) of territorial calls (as per DEWHA 2010).

2.2.5 Search effort

Over the course of 3 days, a total of twenty-four bird surveys were undertaken across the Study Area (Table 2, Figure 3). No surveys were undertaken in the Whyalla Conservation Park, or along the transmission line alignment running east to west to the Cultana substation, due to access limitations.

Table 2. Location details of the bird surveys sites.

Bird Survey Site ID	GPS Location	
	Easting	Northing
1	738691	6345675
2	739260	6346105
3	739600	6347211
4	739853	6347587
5	740205	6348297
6	739824	6348987
7	739500	6349551
8	739739	6349740
9	740482	6349764
10	740546	6349108
11	739746	6345747
12	739657	6346365
13	739432	6346538
14	740387	6354304
15	740404	6354506
16	740430	6354606
17	740646	6352028
18	740920	6350951
19	741106	6350032
20	741184	6349712
21	740760	6353172
22	740348	6354082
23	739831	6349262
24	739777	6348009

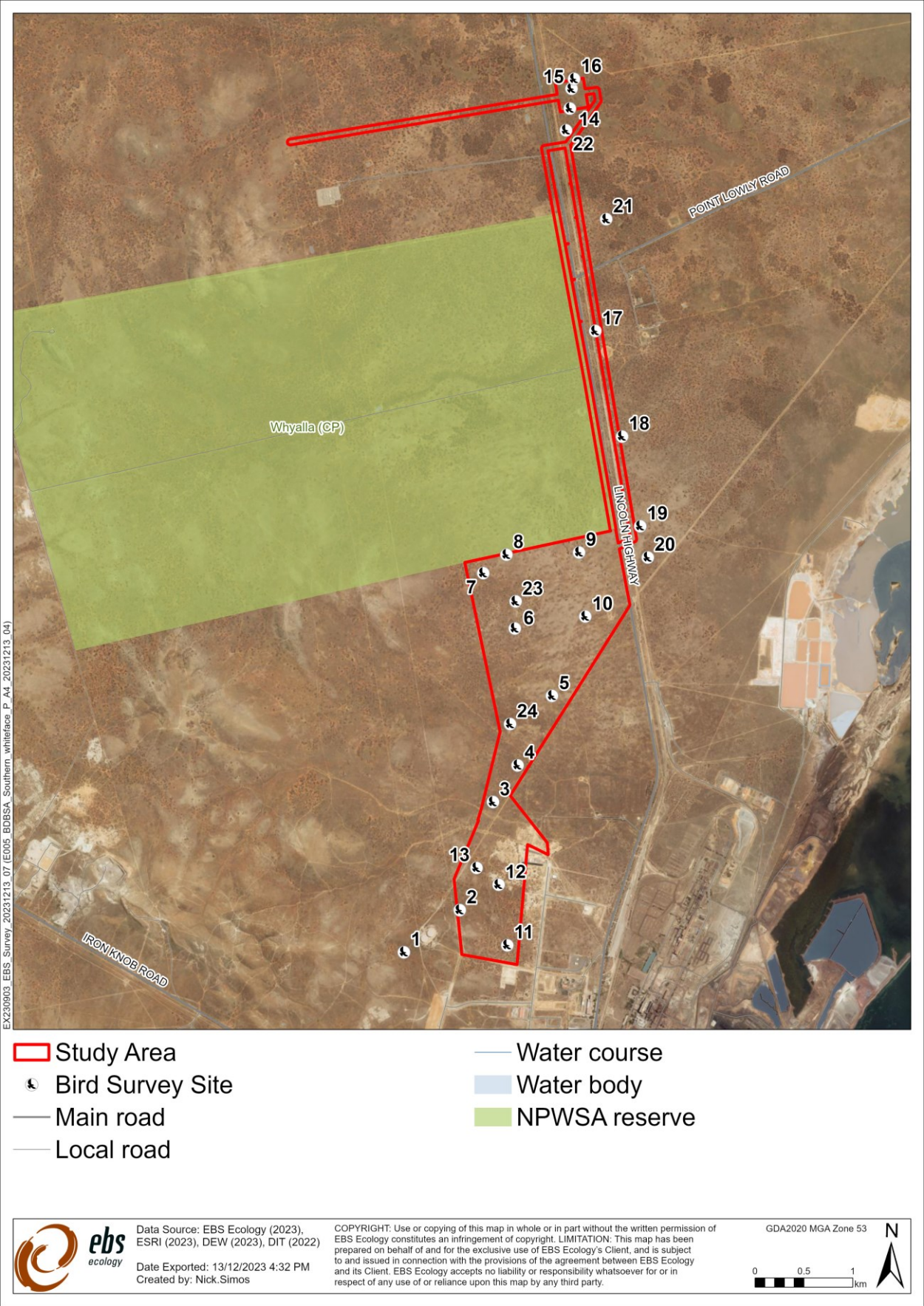


Figure 3. The location of the 24 bird survey sites established over the Study Area in October 2023.

2.2.6 Limitations

The targeted avian surveys (undertaken as per the *Survey guidelines for Australia's threatened birds - Guidelines for detecting birds listed as threatened under the Environment Protection and Biodiversity Conservation Act 1999* (DEWHA 2010)) did not establish or assess Western Grasswren abundance within the Study Area, as the effort in terms of cost and time required for an abundance survey is much greater than that determining presence/absence alone.

Avian survey data collected were limited to a 3-day period, which is in line with the recommended survey for Western Grasswrens as described in DEWHA (2010) (Appendix 1). A 3-day survey represents only a snapshot of current conditions at the time of the survey. The results detailed in this report consist of descriptive statistics (i.e., not inferential statistics) that display and summarize the avian observations and data collected at specific sites at a given point in time. Seasonality and variation in local weather conditions may impact on avian activity and thus survey results, because birds are known to be generally less active when climatic conditions are challenging (i.e., low/high temperatures, strong winds/rain). Conditions over the 3-day survey period were not optimal for bird surveys, with low temperatures, strong winds and patchy rainfall.

Vegetation on site was photographed, but not assessed in any detail. As such, variation in vegetation communities and flora species diversity within and between sites was not recorded as part of the scope of this report.

Not all of the Study Area was accessible for avian assessments at the time of surveying, due to site access/permit limitations (e.g., Cultana Land, Whyalla Conservation Park). Therefore, the survey may not have encompassed all possible habitat types within the Study Area which may be associated with the occurrence of Western Grasswrens.

3 AVIAN SURVEY RESULTS

A total of 340 birds of 32 bird species were recorded during the October 2023 survey (Appendix 4).

Two EPBC Act listed avian species were detected within the Study Area:

- Vulnerable Southern Whiteface (*Aphelocephala leucopsis*) was recorded at 7 sites (16 individuals) (see Appendix 5 for location details).
- Vulnerable Western Grasswren (survey results described below in more detail in Section 4).

4 WESTERN GRASSWREN (GAWLER RANGES) (*AMYTORNIS TEXTILIS MYALL*)

4.1 Taxonomy

4.1.1 *Species*

The Western Grasswren (*Amytornis textilis*) is a passerine of the family Maluridae (Christidis & Boles 1994). The Western Grasswren was formerly considered as conspecific with the Thick-billed Grasswren (*Amytornis modestus*) until split as a separate species in 2010 (Black *et al.* 2010).

4.1.2 *Subspecies*

Analysis of plumage, morphology and genetic findings amongst populations identified five subspecies of Western Grasswrens in the *A. textilis* family (Austin *et al.* 2013, Black 2011, Black and Gower 2017, Garnett and Baker 2021), of which three are presumed extinct: Dirk Hartog Island subspecies *A. t. carteri*; East Murchison subspecies *A. t. giganturus* and Large-tailed Grasswren (*A. t. macrourus*). Two subspecies are extant: the Shark Bay subspecies *A. textilis textilis* in Western Australian and the Eyre Peninsula subspecies *A. t. myall* in South Australia.

The subspecies of relevance to this Project is *A. t. myall* (Western Grasswren (Gawler Ranges)).

4.2 Conservation listing

4.2.1 *Commonwealth classification*

The Gawler Ranges subspecies of Western Grasswren (*Amytornis textilis myall*) is listed as 'Vulnerable' under the EPBC Act (Date effective 06-Nov-2014).

4.2.2 *State classification*

A. t. myall is also listed as 'Vulnerable' in South Australia under the *National Parks and Wildlife Act* 1971.

4.2.3 *IUCN Red List classification*

A. textilis has been assessed by *International Union for Conservation of Nature (IUCN) Red List of Threatened Species* in 2016 where it is listed as 'Least Concern'.

A. textilis myall has not been assigned a conservation classification on IUCN Red List. However, *The Action Plan for Australian Birds 2020* (Black, Copley and Garnett 2021) categorises *A. textilis myall* as 'Least Concern'.

4.3 Biology

4.3.1 *Species description*

A. textilis myall Western Grasswren (Gawler Ranges) (referred to as Western Grasswren from hereon) are a small (15-20 centimetre (cm)), pale to dark brown songbird with erect, elongated tail feathers. The breast of the Western Grasswren is light brown and colours fade to off-white on their belly. Plumage darkens on the wings and back of the species, which are brown. Distinctive white streaks from the beak extend to the base of the tail and to the lower breast. Sexes can be distinguished from the chestnut flanks that are present in females and absent in males (Pizzey and Knight 2014). Western Grasswrens are usually seen in pairs or small groups, but sometimes occur singly (Black and Gower 2017).

All grasswren species, including the Western Grasswren, are birds that utilize vegetation close to ground level. They have short-rounded wings and are unable to undertake long flights across large open spaces or at height. Rather, they tend to hop or run between shrubs and grass tussocks. *Amytornis* are notorious for their secretive behaviour and as a result, baseline ecological data for most species are still lacking.

4.3.2 *Breeding*

Western Grasswren breeding behaviour is poorly known but the subspecies is thought to be socially monogamous. Breeding probably occurs from late June to September. It is deemed possible that Western Grasswren can engage in cooperative breeding with additional adults assisting in the raising of young (Higgins *et al.* 2001, Black and Gower 2017), though there is no empirical data to confirm this. Similarly, there is no data on territory size for breeding pairs or groups, but in Western Australia for *A. textilis textilis* the territory is thought to be around 1.2 to 2.0 ha in good seasons (Brooker 1998a, b). Nests vary from open cups, to partly or fully dome-shaped structures solidly constructed from dry grass, saltbush twigs and narrow strips of bark and lined with downy plant material, or occasionally fur and feathers (Brooker 1998a, Higgins *et al.* 2001). Nests are usually located close to the ground in clumps of canegrass or in the centre of low shrubs such as saltbush and blackbush (Brooker 1998a, Higgins *et al.* 2001; Pizzey 1991). Breeding pairs generally produce two to three eggs which are tapered ovals with colouration varying from white to pink and markings ranging from heavy red-brown or purplish-grey spots or blotches to fine red-brown specks (Higgins *et al.* 2001; Pizzey 1991). The generation time is estimated to be 3.3 years (minimum 2.5, maximum 4.1) (Garnett and Baker 2021).

4.3.3 *Distribution*

Western Grasswren occur only in the eastern Gawler Ranges/north-eastern Eyre Peninsula of South Australia (Figure 4). Two historic records (1909) of Western Grasswren are reported from the Yellabinna region in South Australia, 400 km to the west of the current known distribution (Black 2004; Black *et al.* 2009). These records provide an indication that the species was once more widespread (Black and Gower 2017).

Black *et al.* (2009) described the distribution limits of the species which are summarised in Table 3. Major concentrations of Western Grasswrens are present within the south of their distribution, especially along large drainage systems in Myall and Pine Creeks (Black *et al.* 2009). Drainage lines would provide increased availability of water and a source of disturbance in times of flood that facilitate the tall and dense growth of spiny shrubs, which comprise suitable habitat for Western Grasswren.

Table 3. Location of distribution limits for the Western Grasswren (Gawler Ranges) (Black *et al.* 2009).

Distribution limit	Location of distribution extent
Southern	Northern edge of Munyaroo CP and Ash Hall near Sinclair Gap.
Eastern	Murninnie Beach; Eight Mile Creek, south of Whyalla; Myall Creek near the crossing of Port Augusta – Whyalla Road; and Port Augusta – Iron Knob road.
Northern	Gunter's Dam, Carieweloo Station; Scrubby Outstation, Nonning Station.
Western	Mount Ive Homestead.
South-western	Wilcherry (approx. 30 km north of Kimba); north-eastern extremity of Lake Giles CP; 15 km south-west of Iron Knob; and Iron Knob-Iron Baron road.

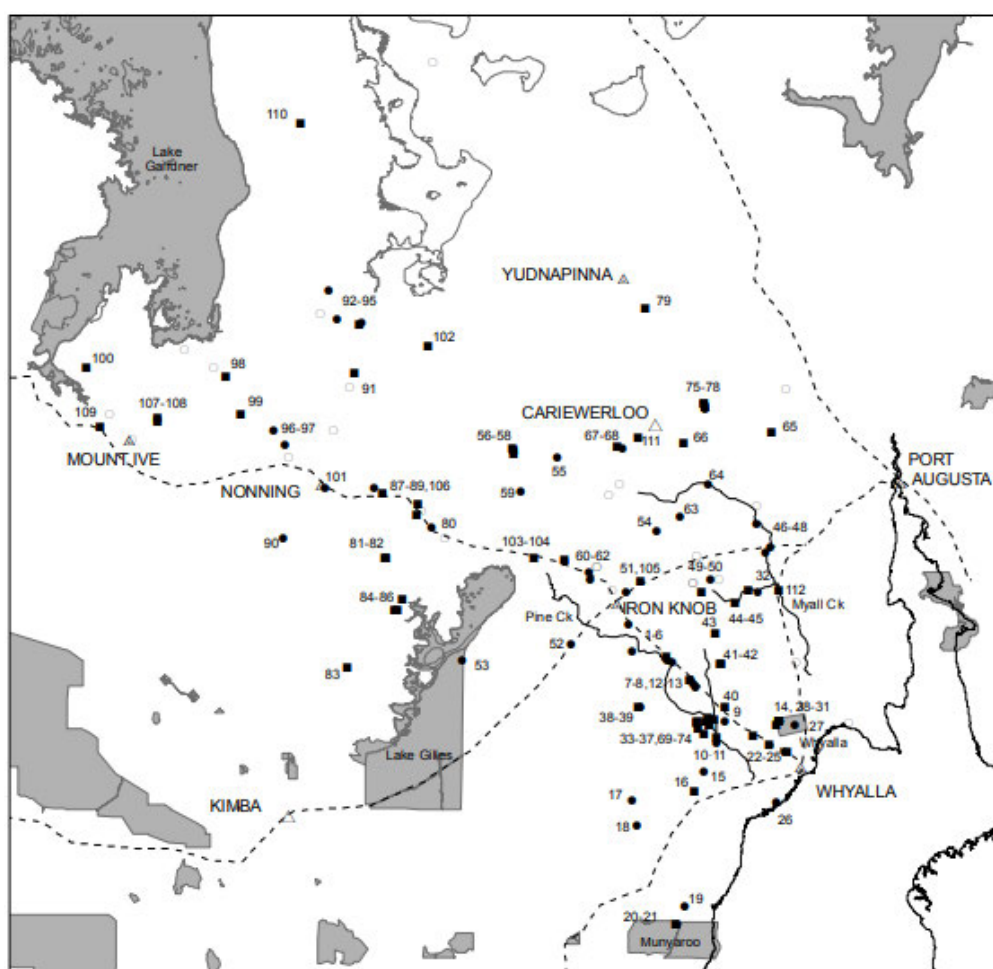


Figure 4. Records of Western Grasswren (Gawler Ranges) (*Amytornis textilis myall*) showing verified previous reports (black circle), previous reports unconfirmed (hollow circle) and new localities identified in the field study by Black *et al.* (2009).

Note that records from the Yellabinnia in 1909 (Black 2004) are not shown, being located about 600 km WNW of Port Augusta (Black *et al.* 2009).

It is thought that about 20% of the Western Grasswren population occurs within the Cultana Training Area near Whyalla (TSSC 2014). As the Study Area shares its northern boundary with the Cultana Training Area, it is likely that any Western Grasswrens in the Study Area are an extension of that population.

4.3.4 Habitat

Suitable habitat for the Western Grasswren (Gawler Ranges) was described by Black *et al.* (2009) as “low-lying areas of Blackbush and spiny shrubs, particularly Australian Boxthorn, either as a shrubland or as an understorey of Western Myall low open woodland”. Furthermore, the “presence of (western) grasswrens could largely be predicted by the total cover of Blackbush, Australian Boxthorn, spiny shrubs, Ruby Saltbush and taller shrubs (over 0.75 m)”.

Areas of suitable habitat for Western Grasswrens are largely restricted to small areas, especially drainage lines (Black *et al.* 2009). Surveys of Western Grasswren habitat by Black *et al.* (2009) found that 64% of sites where Western Grasswrens were recorded were associated with low shrublands, where *M. pyramidata* and *Lycium australe* (Australian Boxthorn) were the dominant shrub species. A further 28% of sites were associated with low woodlands, typically with an *Acacia papyrocarpa* (Western Myall) overstorey.

The structure of habitat is particularly important in determining whether habitat is suitable for Western Grasswrens. Black *et al.* (2009) compared the structure of habitats where Western Grasswrens were detected versus not detected and found that sites where Western Grasswrens were observed had greater total shrub cover; particularly from large shrubs with a dense structure extending to the ground.

4.3.5 Threats

Threats to the Western Grasswren include:

- **Over-grazing:** Grasswren populations are impacted on by habitat loss, fragmentation and degradation due to overgrazing by sheep, feral goats (*Capra hircus*) and Western Grey Kangaroos (*Macropus fuliginosus*) (Garnett and Baker 2021), which can cause a reduction in the cover and density of many chenopod plant species, which comprise the species’ main habitat (Black *et al.* 2009).
- **Unprotected land:** A total of 0.63% (8247 ha) of the land within the Extent of Occurrence (EOO) of the Western Grasswren is located within protected lands, such as Conservation Parks and Heritage Agreements. Furthermore, about 20% of the Western Grasswren population occurs within the Cultana Training Area (Black *et al.* 2009 in DotE 2014), which is used for military purposes, including tank training, and therefore may directly damage habitat (DotE 2014). In addition to this, the area is exempt from the South Australian *Native Vegetation Act 1991* and vegetation clearance is permitted if carried out by the Department of Defence or the Australian Defence Force (DotE 2014).
- **Introduced predators:** Introduced predators, such as cats (*Felis catus*) and foxes (*Vulpes vulpes*) may also threaten Western Grasswrens, as they are known to impact on other

grasswren species. Thick-billed Grasswren (*A. modestus*) has been recorded within the stomach contents of a cat (Woinarski *et al.* 2017). It has been suggested that fox control programs could be a reason for increased numbers of Thick-billed Grasswrens in the north Olary Plains region and Short-tailed Grasswrens (*A. merrotsyi*) in the Flinders Ranges (G. Carpenter pers. comm. in Pedler *et al.* 2007).

- **Mining:** Mining causes direct habitat loss and subsequent degradation of adjacent habitats. In the 1970s, Western Grasswrens were relatively common on the coast south of Whyalla prior to sandmining. However, they are now scarce due to habitat loss associated with mining activity and subsequent damage by off-road vehicles (Black *et al.* 2009).
- **Road development:** The combination of increased run off from the road surface and a lack of stock grazing along the Whyalla – Iron Knob Road has led to the growth of dense stands of *M. pyramidata*, which is known to be suitable habitat of Western Grasswren. Clearance of these areas adjacent to roads for road-widening or water pipeline construction activities can threatened important habitat for the Western Grasswren (Black *et al.* 2009).
- **Incorrect removal of *Lycium australe* (Australian Boxthorn):** The removal of *L. australe* due to its incorrect identification as *Lycium ferocissimum* (African Boxthorn), a Weed of National Significance, has been listed as a potential threat (Black *et al.* 2009).

4.3.6 Population estimates and trajectory

There is only one subpopulation of Western Grasswrens, as all birds occur in a small area with no apparent biogeographic barriers. The two historic records (1909) of Western Grasswren from the Yellabinna region in South Australia, suggests that the species was once more widespread (Black 2004, Black *et al.* 2010, Black and Gower 2017).

The population of the Western Grasswren was estimated by Black *et al.* (2009) to be unlikely to exceed a few thousand individuals in 2006, based upon the availability of suitable habitat current at time of estimate and territory sizes for pairs of four to five ha (based on Schodde 1982). As per Black *et al.* (2021) no subsequent or recent monitoring of known Western Grasswren sites has been undertaken since the 2006 assessment by Black *et al.* (2009).

In 2006, Western Grasswren was present at more than 75% of 62 sites where they were previously recorded during a survey in 2006 (Black *et al.* 2009). Based on these surveys results it was deemed that Western Grasswren have a relatively stable population. It was deemed that the relative stability of the Area of Occupancy (AOO) of the Western Grasswren is likely due to plant species, such as *Maireana pyramidata* (Black bush) and other spiny shrubs, that are important habitat features, being favoured by light to moderate grazing (Black *et al.* 2009). The absence of Western Grasswrens from approximately 25% of their previous identified localities could be due to several factors, including drought and grazing by stock, mainly sheep and cattle, and rabbits (Black *et al.* 2009).

The identification of causal mechanisms underlying grasswren population declines continues to be a difficult task, especially when the knowledge of the behavioural ecology of most grasswrens species, including Western Grasswrens, is very limited.

Garnett *et al.* (2011) estimated the Western Grasswren population to be between 4800-12000 individuals based upon the species AOO and population density. The mid-point of 8400 individuals (Garnett *et al.* 2011) is used in the approved Conservation Advice for the species (DotE 2014), which is still the only and thus current conservation advice for the species.

Current estimate

As reported more recently in Black *et al.* (2021) population densities determined from other taxa suggest the Western Grasswren population is larger than previously realised and the evidence for continual decline is equivocal. Black *et al.* (2021) estimate that the Western Grasswren population is 12000 mature individuals (with a minimum of 8000 and a maximum of 16000 mature individuals), but this estimate has a low reliability. The population trend of Western Grasswren is considered stable (Black *et al.* 2021), but there is a paucity of empirical data to support this.

Important population

As per the *Matters of National Environmental Significance Significant impact guidelines 1.1 Environment Protection and Biodiversity Conservation Act 1999* (DotE 2013), the population of Western Grasswrens is an important population, as it is a population that is necessary for the species' long-term survival and recovery.

4.3.7 Extent of Occurrence and Area of Occupancy

The EOO and AOO of Western Grasswrens has been estimated based on the *Guidelines for assessing the conservation status of native species according to the EPBC Act 1999 and EPBC Regulations 2000* (Threatened Species Scientific Committee, 2000). These guidelines are summarised in Appendix 3.

The EOO and AOO of the Western Grasswren has been calculated as per shown in Table 4. Both areas are shown on the map in Figure 5.

Table 4. The Extent of Occurrence (EOO) and Area of Occupancy (AOO) of Western Grasswren.

EOO (km ²)	EOO (ha)	AOO (km ²)	AOO (ha)
15,015.86	1,501,586.14	2,525.00	252,500.00

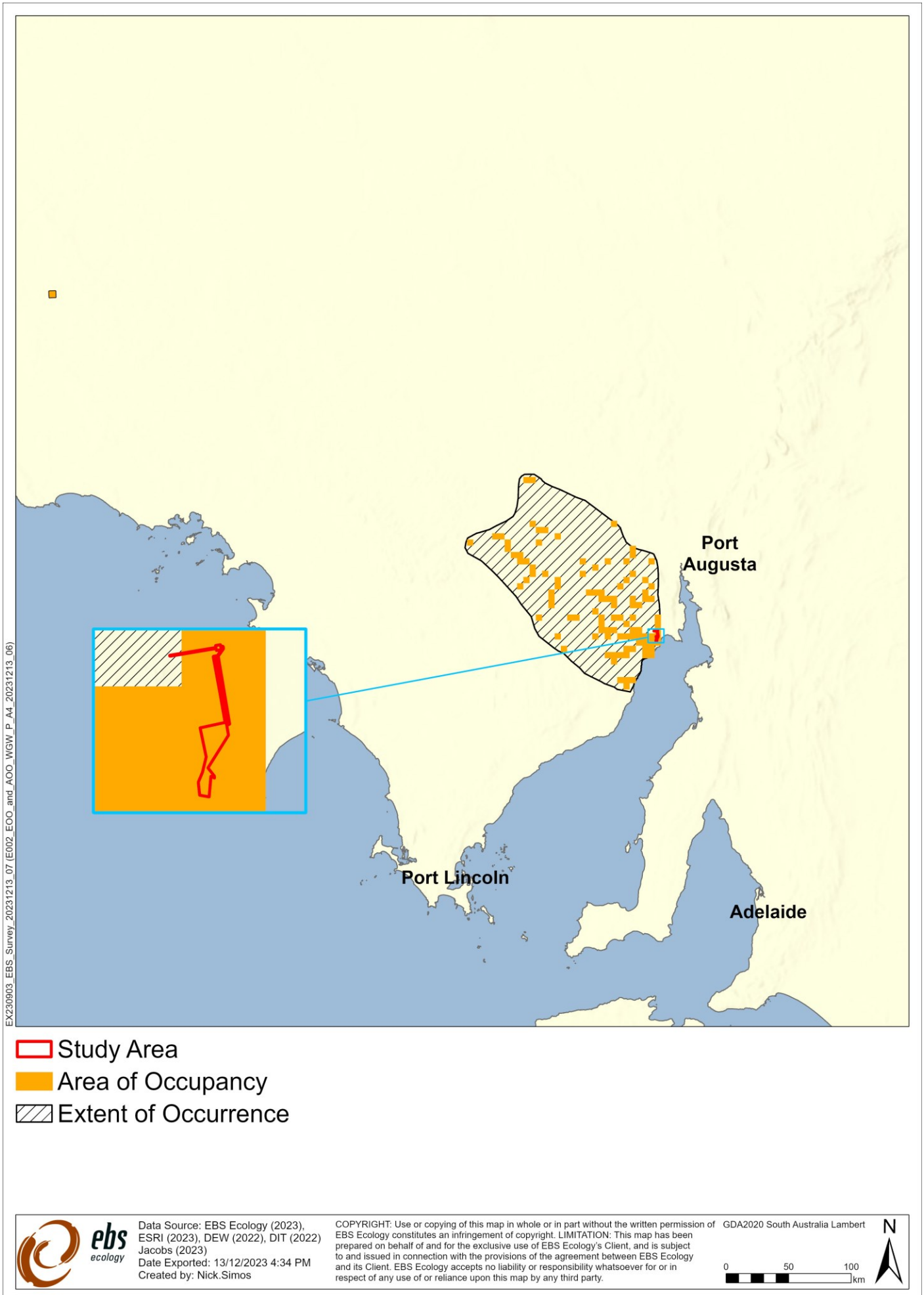


Figure 5. Extent of Occurrence (EOO) and Area of Occupancy (AOO) of the Western Grasswren. The AOO has been calculated using historical records and observations collected by Jacobs and EBS Ecology in 2022 and 2023. All historical records were sourced from the Biological Database of South Australia.

4.3.8 Occurrence of Western Grasswren in the Study Area

Western Grasswren was recorded at 11 of the 24 survey sites within the Study Area. A minimum of 23 individuals were recorded over the 3-day survey period (Table 5). It should be noted that this is a conservative number, as in some instances additional Western Grasswren individual(s) may have been present, but could not be confirmed by sight (Table 5).

Table 5. Observations of Western Grasswrens within the Study Area in October 2023.

Survey site	Date	Time (AM/PM)	GPS location	No of individuals.	Comments/ observations
1	3/10/2023	PM	E 738691 N 6345675	3-4	Two individuals observed multiple times in different locations. Likely 4 birds present.
2	3/10/2023	PM	E 739260 N 6346105	1	One individual (presumed male) observed. No vocalizations heard.
3	3/10/2023	PM	E 739600 N 6347211	2	Male and female observed.
4	3/10/2023	PM	E739853 N 6347587	3-4	Heard 3-4 individuals vocalizing, one individual was flushed from a shrub, possibly 4 individual present.
5	3/10/2023	PM	E 740205 N 6348297	1-2	One individual observed, other heard. Possibly 2 individuals present
6	4/10/2023	AM	E 739824 N 6348987	2	Male seen + other individual heard vocalizing.
10	4/10/2023	AM	E 740546 N 6349108	2	Two individuals observed.
14	4/10/2023	PM	E 740387 N 6354304	2	Two individuals observed.
20	5/10/2023	AM	E 741184 N 6349712	3	Heard individuals vocalising before playback, 3 individuals seen.
22	5/10/2023	AM	E 740348 N 6354082	2	Male and female observed.
24	5/10/2023	PM	E 739777 N 6348009	2	Male and female observed.

4.3.9 Suitable habitat in the Study Area

Vegetation and habitat assessments were outside the scope of works for this report. Vegetation assessments and habitat mapping was undertaken by Jacobs (2023) and data was provided to EBS Ecology to include in mapping in this report. The vegetation associations as per Jacobs (2023) and notes on their suitability for Western Grasswren are presented in Table 6.

Table 6. Vegetation associations of the Study Area (as per Jacobs 2023) and their suitability as Western Grasswren habitat.

Vegetation Association	Western Grasswrens Observed	Suitable Habitat
Chenopod open shrublands +/- emergent trees	Yes, Bird sites 5, 10, 20	Yes
Inland tall shrublands on calcrete	No	No
Low open woodlands of Western Myall with a Chenopod shrub understorey	Yes, Bird Site 2, 3, 4, 24	Yes
Low open woodlands with Western Myall and Blackoak over chenopod shrub understorey	Yes, Bird Site 6, 14, 22	Yes

Western Grasswren were observed by EBS Ecology in 3 out of the 4 broad vegetation associations present within the Study Area (Figure 6; Table 6).

As such all vegetation within the Study Area is deemed suitable for Western Grasswren, with the exception of one small more degraded area of low open woodland of Western Myall with a Chenopod shrub understorey located in the southeastern corner of the Study Area (i.e., the area around Bird Site 11 and 12). This area is relatively degraded due to anthropogenic impacts such as existing trails and tracks (walking / motorbike) and historic earth works. There are many existing dirt tracks in this area with highly disturbed soil, and a borrow pit is present. This area is mapped in more detail by Jacobs (2023) as *Scaevola spinescens* low open shrubland with emergent *Acacia papyrocarpa* / *Myoporum platycarpum* on borrow pit (degraded), and described as:

“Within BAM21 in the southern section of the project area there is a section that is highly disturbed / impacted (looks like old quarries) that offers limited/low habitat value for Western Grasswren.”

“Within BAM22, there is an area on the eastern section of the project area that is highly degraded, containing existing trails and tracks (walking / motorbike) and is therefore considered to have limited / low value for threatened fauna including Western Grasswren.”

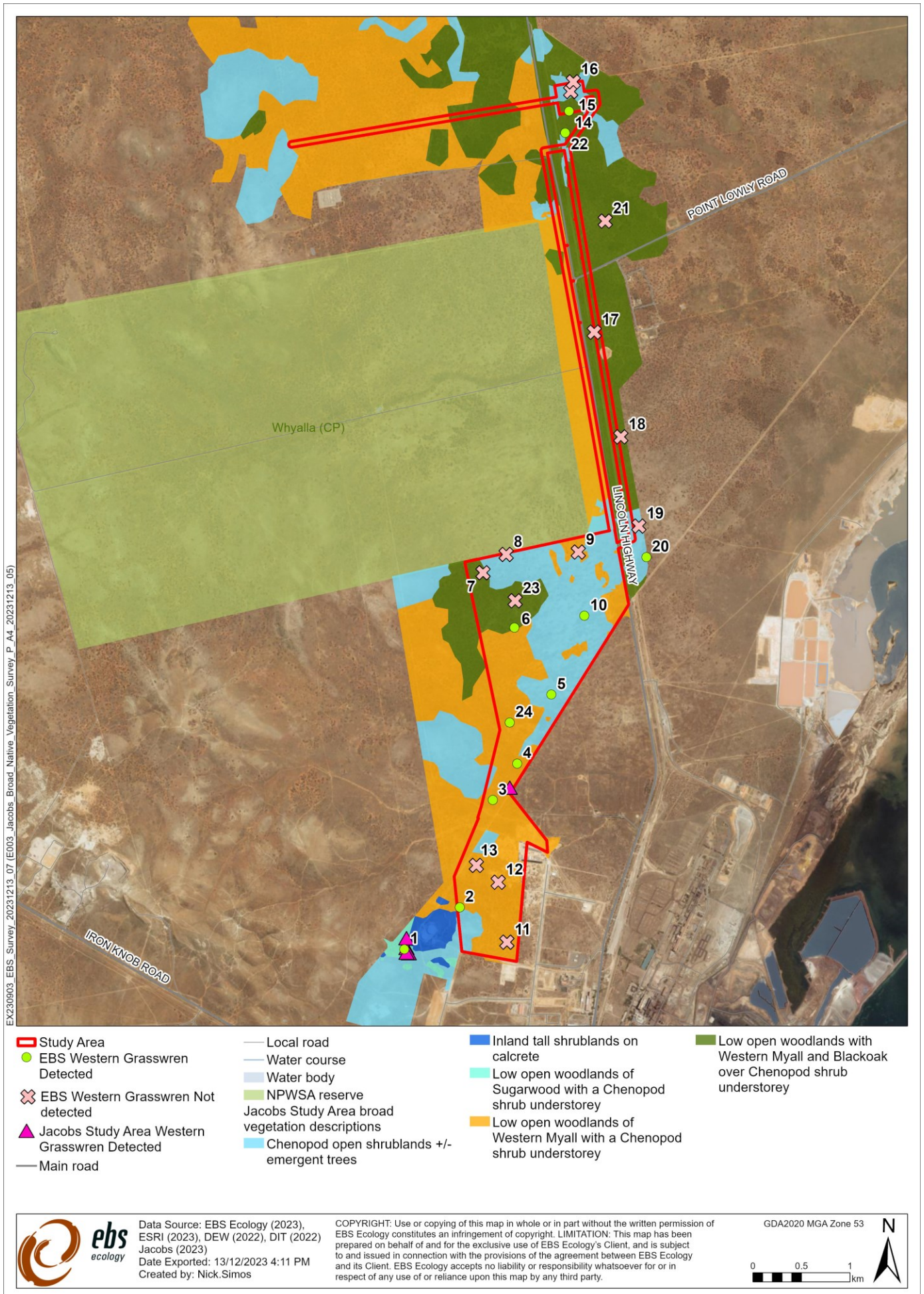


Figure 6. The location of bird survey sites and Western Grasswren observations collected by EBS Ecology in 2023 in relation to broad habitat mapping as per Jacobs (2023).

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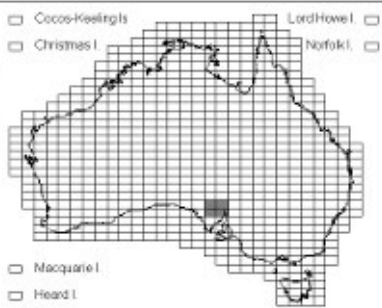
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6 APPENDICES

6.1 Appendix 1. DEWHA survey guidelines for *A. t. myall* (Source: Survey guidelines for Australia's threatened birds (DEWHA 2010)*)

Thick-billed grasswren (Gawler Ranges)	
Common name	Thick-billed grasswren (Gawler Ranges)
Scientific name	<i>Amytornis textilis myall</i>
Family	Maluridae
EPBC Act status	Vulnerable



Distinctiveness

Within range could be confused with striated *A. striatus* and short-tailed *A. merrotsyi* grasswrens.

Movements

No information but probably sedentary (Higgins et al. 2001).

Breeding season

As in other subspecies, the breeding season is probably June to September (Schodde 1982; Higgins et al. 2001).

Habitat

Occurs in open chenopod shrublands, often where dense stands of dead finish *Acacia tetragonophylla* or blackbush *Maireana pyramidata* surrounding drainage lines (Matthew & Carpenter 1993; Higgins et al. 2001; J.S. Matthew pers. obs.). Also occurs in saltbush *Atriplex* spp. and bluebush *Maireana* spp. Shrublands, with a sparse or open overstorey of low trees or shrubs such as western myall *Acacia papyrocarpa*, black oak *Casuarina cristata*, Australian boxthorn *Lycium australe*, bullock bush *Alectryon oleaefolium* and sugarwood *Myoporum platycarpum* (Schodde 1982; Joseph & Black 1983; Matthew & Carpenter 1993; Rowley & Russell 1997; Higgins et al. 2001).

Dispersion

Usually seen in pairs or small groups; sometimes singly. Probably territorial year-round (Higgins et al. 2001).

Detectability

Usually furtive and difficult to observe, though sometimes climbs briefly to a vantage point before disappearing into cover. Call soft and so high pitched that difficult to hear especially in windy conditions. Would probably respond to broadcast (playback) of territorial call.

* Note that Western Grasswren was formerly considered as conspecific with Thick-billed Grasswren (*Amytornis modestus*) until split as a separate species in 2010 (Black *et al.* 2010). Hence DEWHA (2010) refers to Thick-billed Grasswren as a common name, instead of Western Grasswren.

Recommended methods

Area searches or transect surveys early in the morning in suitable habitat. Detection by calls and sightings. Also broadcast surveys likely to be effective at soliciting responses, especially in the breeding season. Mist-netting may be useful in areas of low, dense vegetation with bottom pocket of net set at ground level.




Survey effort guide

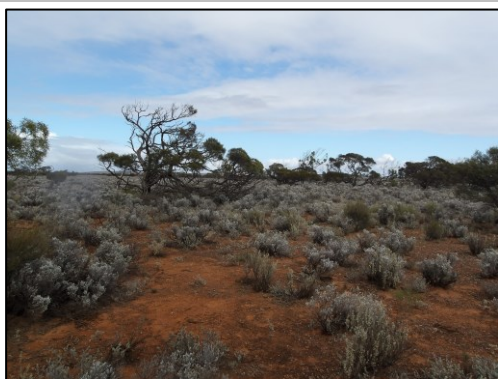
Methods	Hours	Days
Area searches or transect surveys *	15	3
Broadcast surveys	15	3
Mist-netting	15	3

* In areas of less than 50 ha.

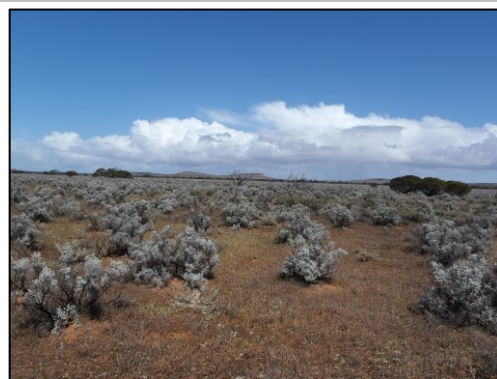


6.2 Appendix 2. Site photos

	
<p>Site 1 E738691 N6345675</p>	<p>Site 2 E739260 N6346105</p>
	
<p>Site 3 E739600 N6347211</p>	<p>Site 4 E739853 N6347587</p>
	
<p>Site 5 E740205 N6348297</p>	<p>Site 6 E739824 N6348987</p>
	
<p>Site 7 E739500 N6349551</p>	<p>Site 8 E739739 N6349740</p>



Site 9 E740482 N6349764



Site 10 E740546 N6349108



Site 11 E739746 N6345747



Site 12 E739657 N6346365



Site 13 E739432 N6346538



Site 14 E740387 N6354304



Site 15 E740404 N6354506



Site 16 E740430 N6354606

	
Site 17 E740646 N6352028	Site 18 E740920 N6350951
	
Site 19 E741106 N6350032	Site 20 E741184 N6349712
	
Site 21 E740760 N6353172	Site 22 E740348 N6354082
	
Site 23 E739831 N6349262	Site 24 E739777 N6348009

6.3 Appendix 3. Calculating the Extent of Occurrence and Area of Occupancy

Impact to Western Grasswrens resulting from the proposal has been assessed considering the species' Extent of Occurrence (EOO) and Area of Occupancy (AOO).

The EOO and AOO of Western Grasswrens has been estimated based on the *Guidelines for assessing the conservation status of native species according to the EPBC Act 1999 and EPBC Regulations 2000* (Threatened Species Scientific Committee, 2000). These guidelines are summarised below.

Extent of occurrence

The EOO is defined as the area contained within the shortest continuous imaginary boundary which can be drawn to encompass all the known, records (occurrences) of a species, excluding cases of vagrancy. This measure may exclude discontinuities or disjunctions within the overall distributions of a species, such as large areas of obviously unsuitable habitat. For this report, EOO has been measured by constructing a minimum convex polygon containing all sites of occurrence, as shown in Figure 7.

Area of occupancy

The AOO of a species is defined as the area within its EOO which is occupied. The AOO reflects the fact that a species is unlikely to occur throughout the area of its EOO. The size of the area of occupancy will be a function of the scale at which it is measured and should be at a scale appropriate to relevant biological aspects of the species, the nature of threats and the available data. To avoid inconsistencies and bias in assessments caused by estimating area of occupancy at different scales, the guidelines recommend standardisation of estimates by applying a 2 x 2 km grid to occurrence data.

The Western Grasswren occur only in the semi-arid pastoral districts of South Australia and Australia respectively. This area tends to be under-surveyed biologically. For this reason, a more conservative 5 x 5 km grid has been applied to the EOO.

The AOO has been calculated by the total area of grid squares occupied by a species, as shown in Figure 8.

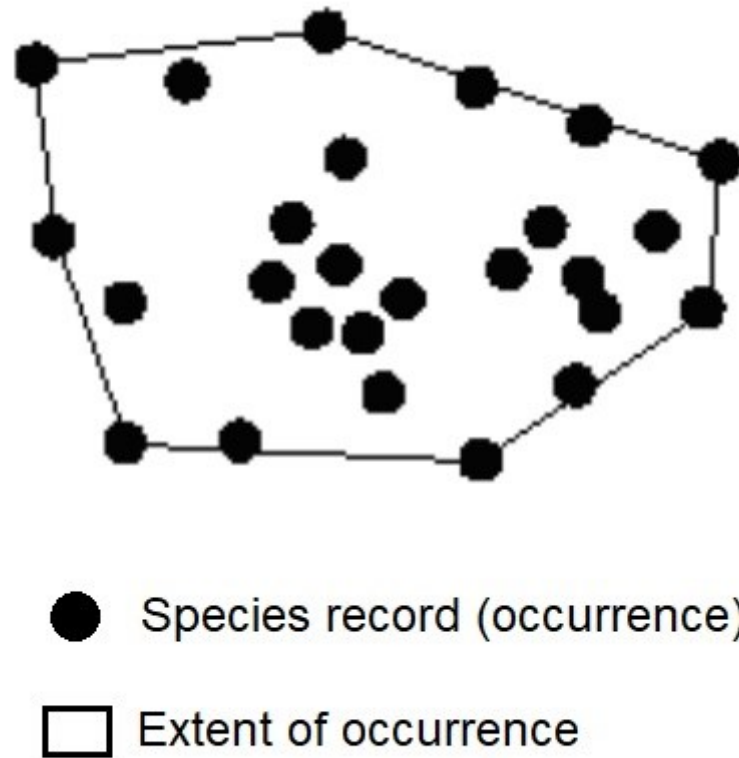


Figure 7. Measure of the Extent of Occurrence (Threatened Species Scientific Committee 2000).

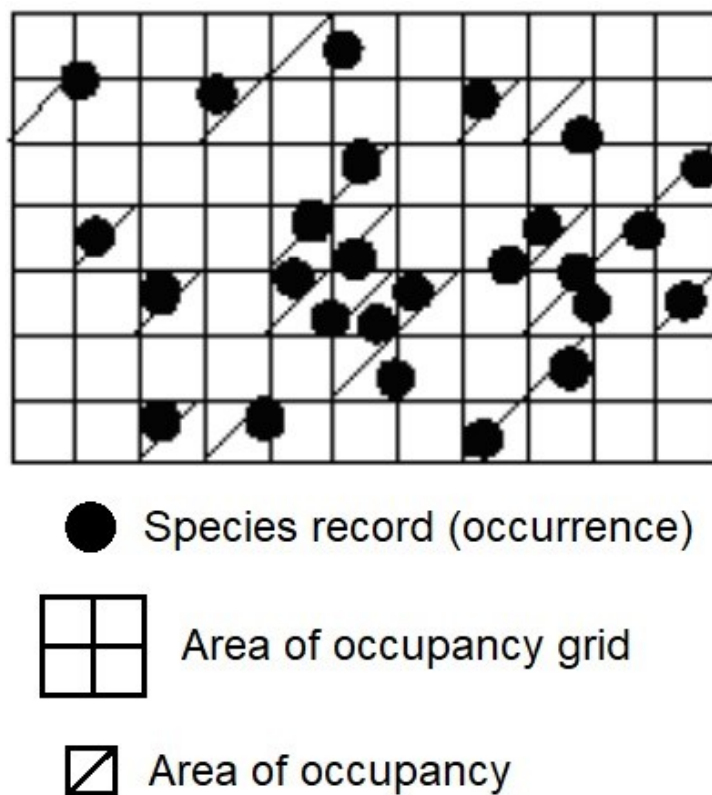


Figure 8. Calculation of the Area of Occupancy (Threatened Species Scientific Committee 2000).

6.4 Appendix 4. Bird species observed during the October 2023 survey

Scientific name	Common name	Conservation status		No of individuals
		Aus	SA	
<i>Acanthagenys rufogularis</i>	Spiny-cheeked Honeyeater			26
<i>Acanthiza chrysorrhoa</i>	Yellow-rumped Thornbill			7
<i>Acanthiza uropygialis</i>	Chestnut-rumped Thornbill			17
<i>Amytornis textilis myall</i>	Western Grasswren	VU	V	24
<i>Anthochaera carunculata</i>	Red Wattlebird			2
<i>Aphelocephala leucopsis leucopsis</i>	Southern Whiteface	VU		16
<i>Artamus cinereus</i>	Black-faced Woodswallow			10
<i>Cacomantis pallidus</i>	Pallid Cuckoo			1
<i>Calamanthus</i> sp.	Calamanthus sp.			1
<i>Certhionyx variegatus</i>	Pied Honeyeater			1
<i>Chalcites basalis</i>	Horsfield's Bronze Cuckoo			1
<i>Coracina novaehollandiae</i>	Black-faced Cuckooshrike			4
<i>Corvus</i> sp.	Crows			7
<i>Cracticus torquatus leucopterus</i>	Grey Butcherbird			6
<i>CUCULIDAE</i> sp.	Cuckoos			1
<i>Eolophus roseicapilla</i>	Galah			32
<i>Epthianura albifrons</i>	White-fronted Chat			3
<i>Falco cenchroides cenchroides</i>	Nankeen Kestrel			8
<i>Gavicalis virescens</i>	Singing Honeyeater			20
<i>Grallina cyanoleuca cyanoleuca</i>	Magpielark			1
<i>Gymnorhina tibicen</i>	Australian Magpie			1
<i>Hirundo neoxena neoxena</i>	Welcome Swallow			12
<i>Malurus assimilis assimilis</i>	Purple-backed Fairywren			29
<i>Malurus leucopterus</i>	White-winged Fairywren			27
<i>Malurus splendens</i>	Splendid Fairywren			14
<i>Manorina flavigula</i>	Yellow-throated Miner			2
<i>Ocyphaps lophotes lophotes</i>	Crested Pigeon			14
<i>Oreoica gutturalis</i>	Crested Bellbird			3
<i>Pachycephala rufiventris rufiventris</i>	Rufous Whistler			1
<i>Petroica goodenovii</i>	Red-capped Robin			5
<i>Pomatostomus superciliosus</i>	White-browed Babbler			38
<i>Pyrrholaemus brunneus</i>	Redthroat			5
TOTAL				340

Conservation status

Aus: Australia (*Environment Protection and Biodiversity Conservation Act 1999*). SA: South Australia (*National Parks and Wildlife Act 1972*). Conservation Codes: VU/V: Vulnerable.

6.5 Appendix 5. Location of Southern Whiteface (*Aphelocephala leucopsis leucopsis*) observed during the October 2023 survey

Date	Easting	Northing	Common Name	Scientific Name	No. Individuals	Activity
4/10/2023	740387	6354304	Southern Whiteface	<i>Aphelocephala leucopsis leucopsis</i>	2	ROT
3/10/2023	739260	6346105	Southern Whiteface	<i>A. l. leucopsis</i>	4	ROT
4/10/2023	739500	6349551	Southern Whiteface	<i>A. l. leucopsis</i>	3	ROS
4/10/2023	740482	6349764	Southern Whiteface	<i>A. l. leucopsis</i>	2	ROT
5/10/2023	741106	6350032	Southern Whiteface	<i>A. l. leucopsis</i>	1	ROS
5/10/2023	741184	6349712	Southern Whiteface	<i>A. l. leucopsis</i>	2	ROS
5/10/2023	739777	6348009	Southern Whiteface	<i>A. l. leucopsis</i>	2	ROS
TOTAL					16	

Activity: ROT = rest on tree. ROS = Rest on Shrub.



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Attachment F Site 1 Ecology Baseline Assessment Report (Jacobs, 2023b)

NOTE: This report was published in March 2024 as Attachment B of the **Hydrogen Jobs Plan** EPBC Referral #2023/09759.



OFFICE OF HYDROGEN POWER SOUTH AUSTRALIA

South Australian Government Renewable Hydrogen Power Station, Electrolysers and Storage Facility

Site 1 and Transmission Line Ecology Baseline Assessment

Jacobs

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South Australian Government Renewable Hydrogen Power Station, Electrolysers and Storage Facility

Site 1 and Transmission Line Ecology Baseline Assessment

Client name:	Office of Hydrogen Power South Australia		
Project name:	Hydrogen Jobs Plan – Site 1 and Transmission Line Envelope		
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Executive summary

The Office of Hydrogen Power South Australia (OHPSA) is progressing the Hydrogen Jobs Plan Project (the HJP Project / the Project), involving the potential development of a site 6.5 kilometres (km) north of Whyalla, South Australia, for the purposes of hosting infrastructure associated with the production of hydrogen.

The HJP Project aims to provide additional grid stability, support the renewable energy market and offer 'firming services' to renewable energy generation facilities through the construction of a hydrogen power station, including 250 Megawatts electric (MWe) of electrolyzers to separate water into hydrogen and oxygen, 200 MW of power generation, a hydrogen storage facility and supporting infrastructure requirements (including transmission network and water supply).

This report relates to the terrestrial ecology assessment of the HJP Project, which includes the site being considered for the main hydrogen infrastructure (the "Site 1 Project Area") and a transmission line and sub-station extending to the north, west of the Lincoln Highway (the "Transmission Line Envelope"). The combined infrastructure component areas are referred to collectively as the "HJP Project Area".

The HJP Project Area occurs within the Eyre Peninsula Landscape Management Region (EP LMR). The desktop assessment and field survey methodologies align with relevant Native Vegetation Council (NVC) requirements for this region, including studies of a five km buffer area from the HJP Project Area (the HJP Study Area) and field assessment using the Bushland Assessment Methodology (BAM) (NVC 2020a, b, d) to collect information to value the vegetation, drive mitigation and enable calculation of Significant Environmental Benefit (SEB) (offsets) when an impact footprint is determined.

Findings suggest there are several ecological constraints associated with potential development of the HJP Project Area, including potential impact to *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) listed species, Western Grasswren (*Amytornis textilis myall*, listed as vulnerable (VU)). The HJP Project Area provides known high-quality habitat for Western Grasswren with a number of individuals seen or heard across the Site 1 Project Area during Jacobs' field surveys and suitable habitat also observed in the Transmission Line Envelope.

The site also provides habitat for EPBC Act listed Southern Whiteface (*Aphelocephala leucopsis*, VU). This species was not observed during the Jacobs surveys, however, previous records indicate presence, albeit the habitat of this species is widespread throughout much of southern Australia.

As the proposed impact footprint/s, nor the infrastructure requirements (and associated area of disturbance for installation), are known at this stage, it is difficult to gauge the potential impacts to threatened species. However, the HJP Project Area contains areas of lower ecological value that likely pose lower impact risk for the Project, and a range of avoidance and mitigation approaches have been and continue to be considered by OHPSA. This includes targeted field surveys, with a focus to identify areas of very high value and areas of lower value based on habitat for EPBC listed species, the abundance of mature trees, floristic and structural diversity and the general condition of vegetation. The results of these surveys are presented in this report.

Vegetation was found to be in good to excellent condition across the HJP Project Area, with degradation exhibited near areas of existing infrastructure and industry, tracks, historical quarries and borrow pits. Overall, for the Site 1 Project Area, the area of highest value vegetation extends downslope from the Whyalla water tanks on all sides, where "Preferred" Western Grasswren habitat was extensive, and vegetation was in excellent condition – i.e., with a high cover of trees and species diversity. Higher value vegetation was also observed in the northwest of the Site 1 Project Area with more heavily wooded and diverse vegetation.

Areas of lower value were observed in the following areas and represent the greatest opportunity to site project infrastructure, whilst reducing impacts to ecological values:

- In the north-east of the Site 1 Project Area and along the existing pipeline track where chenopod shrublands were degraded being more open, with a higher abundance of weeds and evidence of disturbance.

- In the central eastern part of the Site 1 Project Area where a historical excavation / borrow pit supported regenerating vegetation adjacent existing industry.
- In the southern end of the Site 1 Project Area where chenopod shrublands were more open and lower, and old quarries / disturbance sites were scattered throughout. Much of the vegetation in this area is in good condition but is considered to be of lower habitat value.

The Transmission Line Envelope was assessed in less detail than the Site 1 Project Area due to access limitations and time constraints. Much of this area was in good to excellent condition, being positioned in the Whyalla Conservation Park (CP) and in land owned and operated by the Department of Defence (DoD). However, within these areas of high-quality vegetation, there were disturbance corridors, including a track running adjacent (to the west of) the Lincoln Highway for the full extent of the Transmission Line Envelope corridor and disturbance near public access areas. These areas represent preferred locations for linear infrastructure.

East of the Lincoln Highway, within the funnel-shaped land parcel, the chenopod shrubland BAM Site 106 was found to support high value Preferred Western Grasswren habitat, and woodland overstorey providing habitat for Southern Whiteface, whilst BAM 103 was of lower value, lacking tree cover and being classed as Atypical Western Grasswren habitat, with lower, more open chenopods (although still containing *Maireana pyramidata*).

In addition to Preferred Western Grasswren habitat, more heavily wooded areas were considered of higher value providing habitat for Southern Whiteface and if removed, would take longer to regenerate.

The HJP Project also poses a potential risk of impact to protected areas, with the Site 1 Project Area being positioned on the eastern boundary (and overlapping with) Heritage Agreement (HA) 1588 and SEB Area 2007_2001 (approximately 34.5 hectares (ha) of overlap); in addition to abutting the Whyalla CP along the northern boundary. Part of the Transmission Line Envelope west of the Lincoln Highway is also positioned within the Whyalla CP. Clearance of vegetation in protected areas is subject to additional SEB offsets requirements.

Matters of National Environmental Significance (MNES)

The EPBC Act Protected Matters Search Tool (PMST) highlighted a single EPBC Act Threatened Ecological Community (TEC) as potentially occurring within the HJP Study Area, *Subtropical and Temperate Coastal Saltmarsh* (Vulnerable). The HJP Project Area is away from the coast, with no tidal connection, and therefore this community would not (and does not) occur.

The EPBC Act Protected Matters Search Tool (PMST) highlighted three threatened flora species as potentially occurring within the HJP Study Area - *Frankenia plicata* (Sea Heath) (E), *Pterostylis xerophila* (Desert Greenhood) (V) and *Swainsona pyrophila* (Yellow Swainson-pea) (V). None of the three identified flora species have records within the HJP Study Area, and all three are considered unlikely to occur given the lack of potential habitat, lack of records and as they were not observed during the survey (noting Desert Greenhood may have been outside its visible life phase).

The PMST highlighted 18 EPBC Act listed fauna species as potentially occurring in the HJP Study Area (excluding oceanic or marine species), including 16 birds, one mammal and one reptile. The outcomes of a likelihood assessment found:

- Two Vulnerable species are considered known to occur within the HJP Project Area:
 - Western Grasswren (*Amytornis textilis myall*). There were numerous (>10) Western Grasswren detected during Jacobs surveys in the Site 1 Project Area, mostly in the area to the southwest of the Whyalla water tanks (BAM 29, 44, 58), but also a single detection on the eastern border of the Site 1 Project Area (BAM 22). Most of the vegetation present across the HJP Project Area is considered highly suitable for this species, but habitat of highest quality was observed near the Whyalla water tanks (BAM 22, 29, 58) and in the far north of the Transmission Line Envelope (both sides of the

Lincoln Highway) in BAM 61 and 106. Valuable (Atypical) habitat also occurs throughout much of the HJP Project Area including in the Whyalla CP.

- Southern Whiteface (*Aphelocephala leucopsis*). Southern Whiteface was not observed during the surveys but there are two previous records for the species in the HJP Project Area and multiple records nearby in the Whyalla CP, in addition to records in the adjacent Heritage Agreement (HA) 1588 and Significant Environmental Benefit (SEB) 2007_2001. Woodlands and tall shrublands are expected to provide the most valuable habitat for the species including BAM 7, 23, 29, 32, 44, 52, 57, 59, 60, 61, 62 and 81.

Two Vulnerable bird species are considered as possible occurrences within the HJP Project Area, including:

- Grey Falcon (*Falco hypoleucos*). Grey Falcon may occasionally fly over or perch in the area.
- Blue-winged Parrot (*Neophema chrysostoma*). Open chenopod and open woodlands in the HJP Project Area may be suitable, during periods of inland migration, but the species has not been observed, nor known to breed within, the HJP Study Area.

Other EPBC listed species identified in the PMST search and recorded within the HJP Study Area are all shorebirds / coastal birds and would be unlikely to utilise habitat in the HJP Project Area, except possibly for overfly (rarely).

Other species identified in the PMST are all considered unlikely to occur, including the targeted Malleefowl (*Leipoa ocellata*), Sandhill Dunnart (*Sminthopsis psammophila*, E), Flinders Ranges Worm-lizard (*Aprasia pseudopulchella*, VU) and Diamond Firetail (*Stagonopleura guttata*). This is due to a lack of records, suitable habitat and / or the HJP Project Area occurs outside of the known range of the species.

In addition, the PMST identified 16 migratory birds (excluding threatened Migratory birds and Marine species) that may potentially use the HJP Project Area or HJP Study Area. The outcomes of the likelihood assessment suggest that one species is considered as possible to occur as a flyover, Fork-tailed Swift (*Apus pacificus*), while the remainder are considered unlikely to occur. Most of the migratory species highlighted are wetland or coastal birds, for which there is no suitable habitat in the HJP Project Area.

Other General Findings

Five broad vegetation communities and 22 BAM Sites (vegetation associations) have been mapped across the HJP Project Area, the most prevalent being Low open woodlands of Western Myall over Chenopod shrub understorey and Low open woodlands with Western Myall and Blackoak over Chenopod shrub understorey.

Following detailed surveys in September 2023, the HJP Project Area was stratified into the 22 BAM sites (previously nine) to provide additional differentiation between vegetation types, vegetation condition and habitat quality. Broad communities in the HJP Project Area are assembled into three major vegetation groups based on major landform and floristic characteristics. The communities present support more than 90 native flora species and 16 introduced species were recorded opportunistically or at BAM Sites.

All five broad vegetation communities occur within the Myall Plains Interim Biogeographic Regionalisation for Australia (IBRA) Sub-region and dissect two IBRA Associations: Red Rock and Tregolana; in addition to bordering the Whyalla IBRA Association directly to the south. Being positioned close to the junction of three IBRA Associations is a relatively uncommon occurrence likely leading to the somewhat variable landform and range of vegetation communities, including the unique tall shrubland in BAM 23 – which was not observed in any other location in the HJP Project Area.

No EPBC Act listed, or State-listed flora species were observed in the HJP Project Area during the field surveys.

Seventeen native fauna species were observed or detected during the surveys, including 15 birds and two reptiles. One species is listed as threatened, the EPBC Act listed Western Grasswren (*Amytornis textilis*, VU).

Three flora species listed under the National Parks and Wildlife Act (NPW Act) since 1995 (excluding EPBC listed flora) were identified in the Biological Database of South Australia (BDBSA) search, including *Acacia pendula* (Weeping Myall, vulnerable (V)), *Orobanche cernua* var. *australiana* (Australian Broomrape, rare (R)) and *Santalum spicatum* (Sandalwood, V) – none of which were observed within the HJP Project Area during survey. *Acacia pendula* is a widely planted species therefore the record may represent a planted specimen.

There are previous records within the HJP Study Area for 28 bird species listed under the NPW Act (excluding those considered threatened or Migratory under the EPBC Act). Most records are within Whyalla Salt pans, wetlands and foreshore/beach. However, there are two BDBSA records for Slender-billed Thornbill (*Acanthiza iredalei*, rare (R)) in the HJP Project Area, one in the north-west of the Site 1 Project Area and one in the Transmission Line Envelope; in addition to two records within 5km to the west.

Other NPW Act listed species recorded nearby in the Whyalla CP include Gilberts Whistler (*Pachycephala inornata*, R), Restless Flycatcher (*Myiagra inquieta*, R), Little Eagle (*Hieraaetus morphnoides*, V), Elegant Parrot (*Neophema elegans*, R) and Rock Parrot (*Neophema petrophila zietzi*, R). There is also a record for wetland species Wood Sandpiper (*Tringa glareola*, R) east of the Lincoln Highway, opposite the Whyalla CP, and a record for Musk Duck (*Biziura lobata menziesi*, R) in the Whyalla CP. It is considered that all terrestrial birds could potentially occur in the HJP Project Area, but noting a detailed likelihood assessment has not been undertaken for State listed species.

Based on BDBSA records, ten Declared Plants under the *Landscape South Australia Act, 2019* (LSA Act) have been observed with the HJP Study Area, including two Weeds of National Significance (WoNS). Of these, two WoNS (also Declared Plants) were observed, being African Boxthorn (*Lycium ferosissimum*) and Prickly Pear (*Opuntia stricta*). Two Declared Plants (not WoNS) were also observed; Carrion Flower (*Orbea variegata*) and Salvation Jane (*Echium plantagineum*). In addition, 12 other exotic flora species were observed in the HJP Project Area. Movement or increased weed invasion / regeneration during planning and construction is considered a risk requiring mitigation.

This report has been prepared on behalf of, and for the exclusive use of, Jacobs' Client; the Office of Hydrogen Power South Australia and is subject to, and issued in accordance with, the provisions of the contract between Jacobs and the Office of Hydrogen Power South Australia. Jacobs accepts no liability or responsibility whatsoever for, or in respect of, any use of, or reliance upon, this report by any third party.

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The sole purpose of this report and the associated services performed by Jacobs is to provide desktop and field results of flora and fauna studies to inform project location options, project planning, and any required environmental approvals for the Hydrogen Jobs Plan Project. The report is based on a desktop review of available data and documents, as well as field surveys. The scope of services, as described in this report, was developed with Office of Hydrogen Power South Australia.

In preparing this report, Jacobs has relied upon, and presumed accurate, any information (or confirmation of the absence thereof) provided by Infrastructure SA and the Office of Hydrogen Power South Australia and/or from other sources. Except as otherwise stated in the report, Jacobs has not attempted to verify the accuracy or completeness of any such information. If the information is subsequently determined to be false, inaccurate or incomplete then it is possible that our observations and conclusions as expressed in this report may change.

Jacobs collected and reviewed data and information sourced from Office of Hydrogen Power South Australia and/or available in the public domain at the time or times outlined in this report. The passage of time, manifestation of latent conditions or impacts of future events may require further examination of the project and subsequent data analysis, and re-evaluation of the data, findings, observations and conclusions expressed in this report. Jacobs has prepared this report in accordance with the usual care and thoroughness of the consulting profession, for the sole purpose described above and by reference to applicable standards, guidelines, procedures and practices at the date of issue of this report. For the reasons outlined above, however, no other warranty or guarantee, whether expressed or implied, is made as to the data, observations and findings expressed in this report, to the extent permitted by law.

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Acronyms and abbreviations

ALA	Atlas of Living Australia
ARU	Autonomous recording units
BAM	Bushland Assessment Methodology
BAM Sample Point	BAM one hectare sample quadrat assessment site (point data)
BAM Site	Level 3 detailed vegetation association using the BAM (polygon data).
BCM	Bushland Condition Monitoring
BDBSA	Biological Databases of South Australia
BOM	Bureau of Meteorology
Broad Vegetation Community	Level 2 vegetation community grouping.
CP	Conservation Park
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DEW	Department for Environment and Water
E	<i>National Parks and Wildlife Act, 1972</i> - Endangered species
EIS	Environmental Impact Statement
EN	<i>Environment Protection and Biodiversity Conservation Act</i> – Endangered species
EP	Eyre Peninsula
EPBC / EPBC Act	<i>Environment Protection and Biodiversity Conservation / Environment Protection and Biodiversity Conservation Act</i>
IBRA	Interim Biogeographic Regionalisation for Australia
Ha / ha	Hectares
HJP	Hydrogen Jobs Plan
HJP Project Area	Entire Hydrogen Jobs Plan Project Area a used for the ecological assessment, including Site 1 and the Transmission Line Envelope. This is slightly larger than the project area described in the referral and significant impact assessment as the area has been further refined since the ecological assessment was undertaken. Reference should be made to the EPBC referral for the current proposed project area.
HJP Study Area	Five kilometre buffer database search area for matters of National and State significance
Km / km	Kilometres
LMR	Landscape Management Region
LSA Act	<i>Landscape South Australia Act 2019</i>
MAJOR Vegetation Group	Level 1 major vegetation grouping based on major vegetation features and landform (highest level)
MNES	Matters of National Environmental Significance
NPW	<i>National Parks and Wildlife Act 1972</i>
NW / NWSP	Northern Water / Northern Water Supply Project
NV Act	<i>Native Vegetation Act 1991</i>

NVC	Native Vegetation Council
OHPSA	Office of Hydrogen Power South Australia
PDI Act	<i>Planning, Development and Infrastructure Act 2016</i>
PBHEH	Port Bonython Hydrogen Export Hub
PMST	Protected Matters Search Tool
R	<i>National Parks and Wildlife Act, 1972</i> - Rare species
RA	<i>Environment Protection and Biodiversity Conservation Act</i> - Rare species
NW Project	Northern Water Project (Infrastructure South Australia)
SEB	Significant Environmental Benefit
Site 1 Project Area	Area being considered for siting the main hydrogen infrastructure
SPRAT	Species Profile and Threats Database
TEC	Threatened Ecological Community
Transmission Line	Area being considered for the transmission line and substation
TSSC	Threatened Species Scientific Committee
UBS	Unit Biodiversity Score (BAM)
V	<i>National Parks and Wildlife Act, 1972</i> – Vulnerable Species
VU	<i>Environment Protection and Biodiversity Conservation Act</i> - Vulnerable Species

1. Introduction

The Office of Hydrogen Power South Australia (OHPSA) is progressing the Hydrogen Jobs Plan Project (the HJP Project / the Project), involving the potential development of a site north of Whyalla, South Australia (Figure 2-1), for the purposes of hosting infrastructure associated with the production of hydrogen.

The HJP Project will see the construction of a hydrogen power station, including 250 MWe of electrolyzers to separate water into hydrogen and oxygen, 200 MW of power generation, a hydrogen storage facility and supporting infrastructure requirements including a transmission network, water supply and substation.

The operation of the electrolyzers will provide additional grid stability by utilising the State's abundant renewable energy generated from large-scale wind and solar farms, in turn supporting a market for more renewable energy generators to come online. In addition, hydrogen power will offer 'firming services' to renewable energy generation facilities (such as wind and solar farms) located in the State.

Jacobs was engaged to undertake a terrestrial ecological assessment for the HJP Project, and other nearby projects, including the Port Bonython Hydrogen Export Hub (PBHEH) and the Northern Water (NW) Project.

The intent of the assessment was to inform alignment and infrastructure location options, project planning, mitigation and other required environmental approvals for the projects, including identifying any Matters of National Environmental Significance (MNES) under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) relevant to the project areas and to collect information to inform an assessment under the *Native Vegetation Act 1991* (NV Act) and *Native Vegetation Regulations 2017* (NV Regulations).

This report outlines the methodology and results of the desktop assessment and field surveys undertaken; in addition to highlighting potential ecological constraints associated with the HJP Project Area, such as high value vegetation which should be avoided where practicable, to enable OHPSA to inform project planning to best avoid and minimise impacts to ecological values. The report consolidates findings from several surveys including addressing gaps and opportunities identified in the previous report for the Site 1 Project Area (Jacobs 2023) and in discussions with OHPSA.

Opportunities for mitigation have been an ongoing consideration of infrastructure placement and potential avoidance and impact minimisation but are not discussed further in the current report which focuses on the ecological values and condition of the HJP Project Area.

The landscape context and broad natural features of the HJP Project Area is described in Section 4.1 (Desktop Results) and Section 5 (Field Results).

2. Background

2.1 Project Areas

This section describes the HJP Project Area used for the ecological assessment. This is slightly larger than the project area described in the referral and significant impact assessment as the area has been further refined since the ecological assessment was undertaken. Reference should be made to the EPBC referral for the current proposed HJP Project Area.

2.1.1 Site 1 Project Area

The Site 1 Project Area is located approximately 6.5 kilometres (km) north of the Whyalla township and is estimated to be 649 hectares (ha) in size (Figure 2-2).

The Site is bordered by the Whyalla CP to the north and Lincoln Highway to the east and borders and overlaps with Heritage Agreement (HA) 1588 and SEB Area 2007_2001 along the western boundary.

The Site supports widespread native vegetation and a range of infrastructure, including a water distribution pipeline, water storage tanks, solar array and electricity transmission infrastructure. A number of tracks run through the Site 1 Project Area, particularly in the central section, adjacent the main cluster of existing infrastructure and industry. The Site 1 Project Area also appears to be used as an informal recreation area, with trails (walking, possibly motorbikes also) in some areas and members of the public were witnessed utilising the site during the survey.

2.1.2 Transmission Line Envelope

The proposed Transmission Line Envelope extends 5.2 km from the north-eastern corner of the Site 1 Project Area in a 115 m wide corridor west of the Lincoln Highway to a broader envelope extending from approximately 2.6 km west of the Lincoln Highway to 630 metres east of the Highway (Figure 2-2) – to accommodate a sub-station and associated transmission lines and infrastructure.

The proposed Transmission Line Envelope is positioned partly within the Whyalla Conservation Park (CP) and is approximately 427 ha in size.

2.1.3 HJP Project Area

The HJP Project Area comprises the Site 1 Project Area and the Transmission Line Envelope, collectively comprising approximately 1076 ha, and referred herein as the “HJP Project Area”.

The HJP Project Area is located within (wholly or partly) the allotments listed in Table 2-1.

Table 2-1. Site 1 subject allotments

Project component	Parcel number	Volume / Folio	Existing Use ¹ (existing elements)
Site 1	D79748 A 1000	6144 / 358	Recreation / Reserves (access tracks)
	F7887 A1	6045 / 133	Utilities / Industry (comprising water storage tanks)
Transmission line envelope	D56203 A1	CT/5852/367	Whyalla Conservation Park
	H560300 S14	CR/6253/73	Whyalla Conservation Park

¹ According to SAPPA (<https://sappa.plan.sa.gov.au/>), 'Land Use Generalised 2022' layer, viewed 30 June 2023

Project component	Parcel number	Volume / Folio	Existing Use ¹ (existing elements)
	D93251 A67	CL/6253/233	Department of Defence land
	D125055 Q1	CR/6252/999	Council Reserve
	H560300 S35	CT/5983/544	Railway Corridor
	Lincoln Highway Road reserve	NA	Lincoln Highway and shoulder

2.2 Study Area

The 'HJP Study Area' refers to a 5 km buffer placed on the HJP Project Area (refer Figure 2-2).

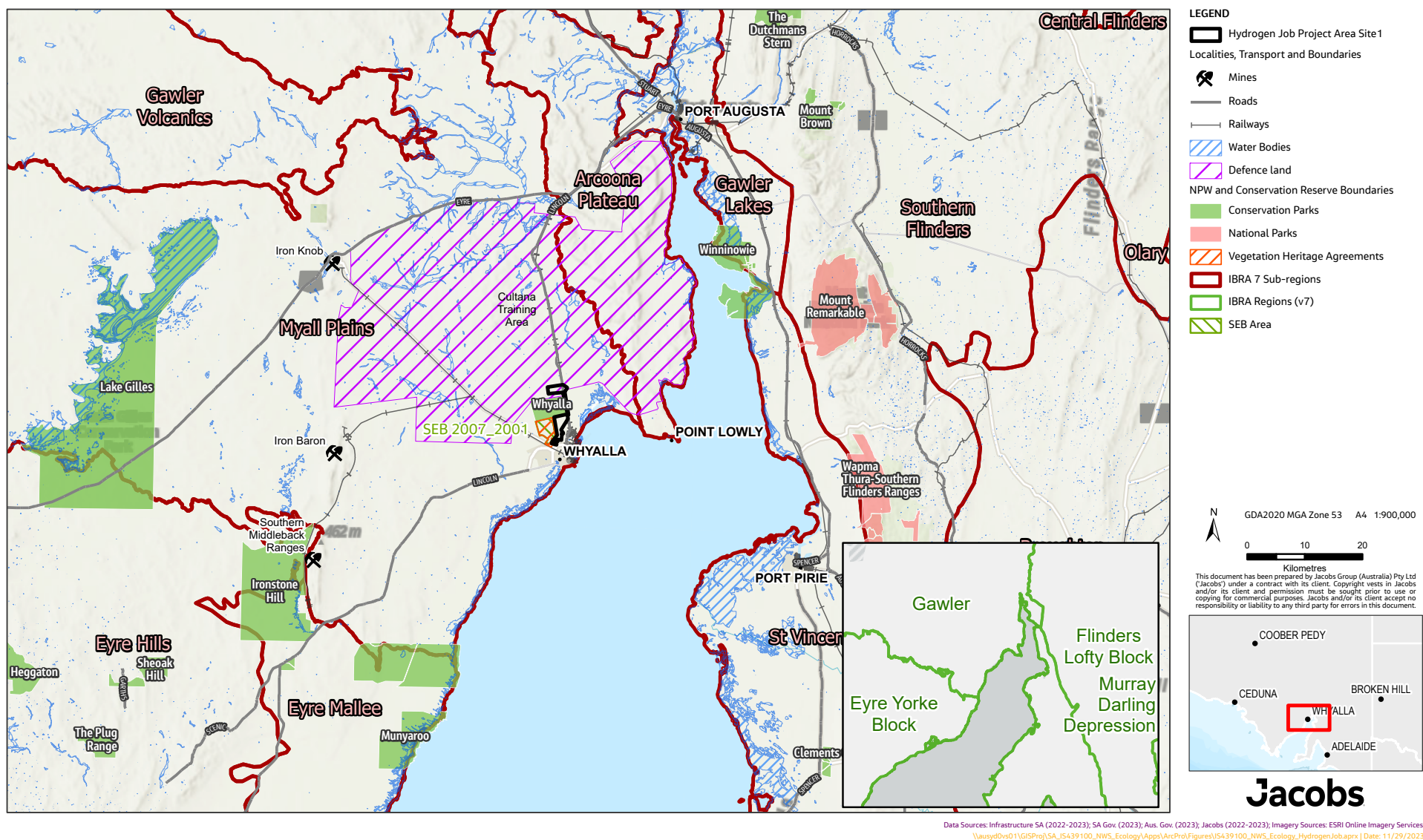


Figure 2-1. Broad location of the Hydrogen Jobs Plan Project Area. Also includes Conservation Parks, including the IBRA Regions (inset) and IBRA Sub-regions (V7)

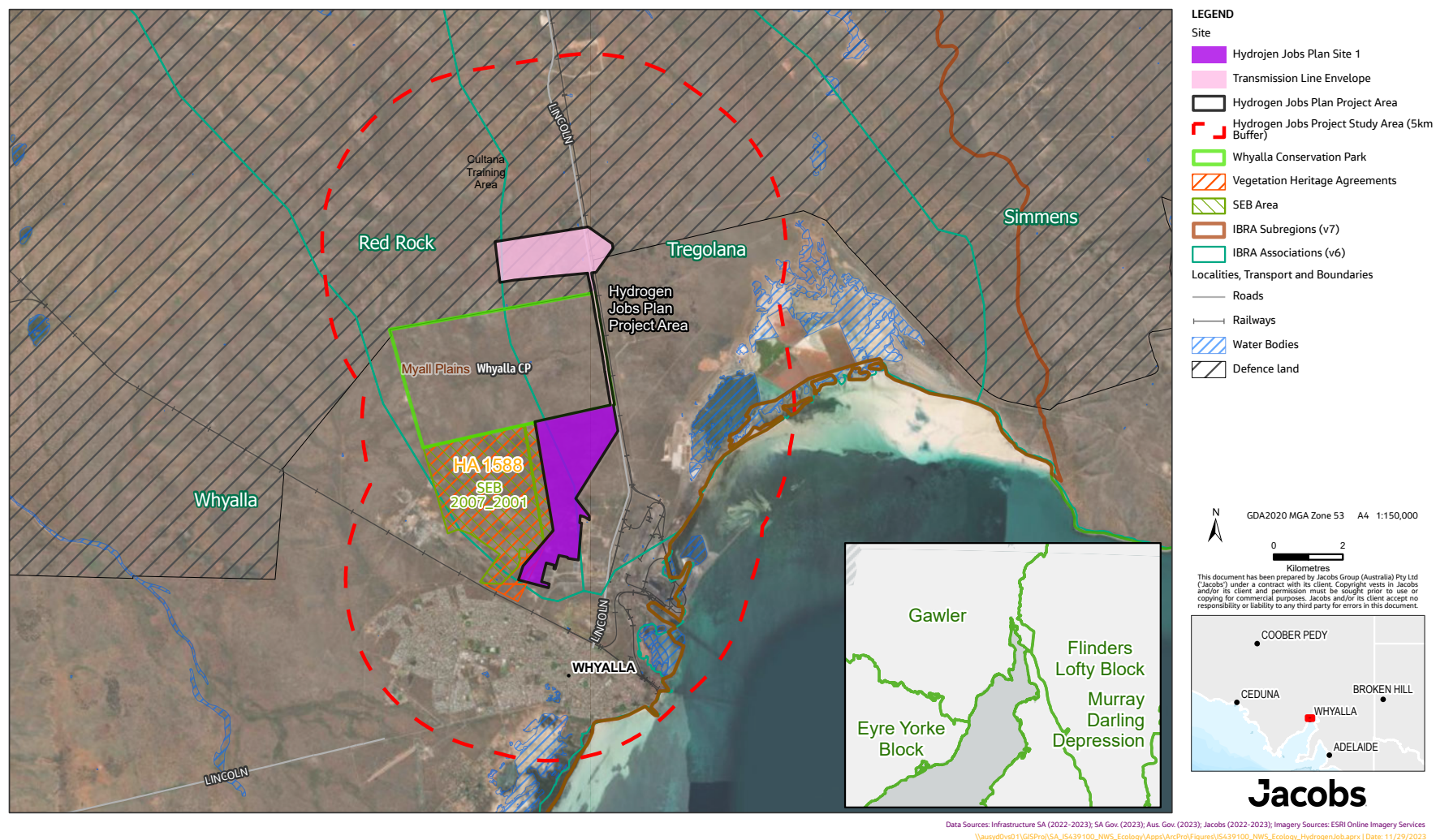


Figure 2-2. HJP Project Area including the Site 1 Project Area component (provided by OHPSA February 2023) and the Transmission Line Envelope (provided by JBS&G November 2023).

(The 5km Study Area for database searches in relation to threatened species, communities and features of interest is also included). IBRA Regions are shown on the inset, whilst IBRA Sub-regions (V7) and IBRA Associations (V6) are shown on the map.)

2.3 Legislative Context

Legislation relevant to ecological aspects of the Project is summarised below.

2.3.1 Environment Protection and Biodiversity Conservation Act 1999 (Cth)

The EPBC Act is the Australian Government's central piece of environmental legislation. It provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities and heritage places — defined in the EPBC Act as Matters of National Environmental Significance (MNES).

The nine MNES identified in the EPBC Act are:

- world heritage properties
- national heritage places
- wetlands of international importance (listed under the Ramsar Convention)
- threatened species and ecological communities
- migratory species as listed under international agreements
- Commonwealth marine areas
- the Great Barrier Reef Marine Park
- nuclear actions (including uranium mining); and
- a water resource, in relation to coal seam gas development and large coal mining development.

If an action has the potential to have a significant impact on an MNES, the proposed action must be referred to the Department of Climate Change, Energy, the Environment and Water (DCCEEW) to determine the requirement for formal assessment and approval under the EPBC Act. Actions that are likely to have a significant impact on an MNES are identified as 'controlled actions' and cannot be undertaken without approval under the EPBC Act.

Desktop assessment and field survey contributed to understanding implications of the Project on MNES with several species identified as occurring or potentially utilising habitat in the HJP Project Area.

Other planning related matters not related to ecology (e.g. any action proposed on Commonwealth Land) are not within the scope of this report.

2.3.2 South Australian Native Vegetation Act 1991 and Regulations 2017

In South Australia, clearance of native vegetation requires approval from the Native Vegetation Council (NVC) (or Delegate in the Department for Environment and Water (DEW)) under the NV Act and Regulations.

The NV Act and Regulations outline incentives, education measures, and assistance to landowners in relation to the preservation and enhancement of native vegetation and acts to control the clearance of native vegetation. Under the NV Act, legal clearance of native vegetation may be permissible through one of two mechanisms: either by an application to the NVC, or under exemptions contained within the Regulations.

Based on desktop assessment and field survey, remnant native vegetation is present within the HJP Project Area and will require clearance to accommodate the Project. Remnant vegetation is depicted on Figure 4-1 (DEW NatureMaps 2023). Vegetation mapped during field survey is depicted on Figure 5-1, Figure 5-2, Figure 5-3, Figure 5-4 and Figure 5-5.

It is expected that vegetation clearance for the Project will be applicable under *Regulation 12(34) – Infrastructure* of the NV Regulations. Clearance under this Regulation is explained in the *NVC Guide to the Native Vegetation Regulations* (NVC 2020e).

Clearance under *Regulation 12(34)* requires establishment of a Significant Environmental Benefit (SEB) to offset removal of the vegetation. The SEB is quantified via assessment using the NVC Bushland Assessment Methodology (NVC 2020b) in the Eyre Peninsula Landscape Management Region (EP LMR) which includes a desktop assessment and on ground field survey, with the SEB determined based on factors such as landscape context, vegetation condition, potential habitat for threatened species and the cost to replace vegetation in that location. A similar methodology called the Rangeland Assessment Methodology (RAM) is applicable in the South Australian Arid Lands (SAAL) Landscape Management Region and is more targeted at grazing impact and landform features and disturbance.

2.3.3 Landscape South Australia Act 2019

The *Landscape South Australia Act 2019* (LSA Act) replaced the *Natural Resources Management Act 2004* as the key framework promoting the sustainable and integrated management of the State's natural resources (land, water, biodiversity) and for the management of pest plants and animals. Under the LSA Act, South Australia is divided into eight regional Boards, of which the Project falls within the Eyre Peninsula Landscape Board, managed by the Government of South Australia. Each Board develops its own Regional Plan designed to meet the needs of the local regions and contribute to state level planning.

In the context of the Project, the LSA Act will guide biodiversity management (including management of pests, exotic flora and fauna) and as mentioned in section 2.3.2 the location of assessment areas influences the method of vegetation assessments (in this case BAM applies) required for any proposed impacts to native vegetation and associated approvals.

2.3.4 Planning, Development and Infrastructure Act 2016

The *Planning, Development and Infrastructure Act 2016* (PDI Act) and *Planning, Development and Infrastructure Regulations 2017* (PDI Regulations) governs the planning system in SA and sets out the process and pathways for granting development approvals, including Crown Development.

Projects being undertaken by Crown agencies such as OHPSA are subject to the processes applying to a Crown development under section 130 or 131 of the PDI Act. It should be noted that a draft Bill for new legislation, namely the *Hydrogen and Renewable Energy Act* (see section 2.3.5) has been drafted by the South Australian State government. It is expected this Act will provide a new legislative pathway for future hydrogen and renewable energy projects. However, due to the approval timeframe, it is expected the HJP Project will be lodged and assessed under the PDI Act.

The HJP Project will be considered as a Crown development and essential infrastructure. The Crown Development and Essential Infrastructure assessment pathways under Sections 130 and 131 of the PDI Act provide a dedicated assessment process for State agency development and essential infrastructure proposals, where the Minister for Planning is the decision maker (Plan SA 2023). Applications for Crown and Essential Infrastructure applications are made through the PlanSA Development Application Processing (DAP) system (Plan SA 2023).

2.3.5 Hydrogen and Renewable Energy Act

The Bill for the *Hydrogen and Renewable Energy Act* has been drafted by the South Australian State government.

The proposed *Hydrogen and Renewable Energy Act* aims to introduce a 'one window to government' licencing and regulatory system for the lifecycle of large-scale hydrogen and renewable energy projects in South Australia.

Under the proposed Act:

- Government owned land and waters where renewable energy projects can be hosted will be identified by the South Australian Government
- Companies will compete for licences to access government owned land and waters to deliver these projects
- New, fit for purpose licensing arrangements will be established for projects across all land types, enabling regulation of the whole project life cycle
- First Nations people's rights and interests will be considered early and throughout the regulatory processes
- A framework will ensure that developments are delivered with net environmental benefit
- Requirements will be put in place to ensure land is rehabilitated and returned to pre-existing conditions; and
- Multiple land use provisions will be sought to deliver fair outcomes for landowners, communities and other pre-existing land rights holders.

Whilst not expected, it is possible the approval pathway for any or all elements for the Project may fall under the *Hydrogen and Renewable Energy Act*.

3. Methods

Application of the NVC BAM was used to assess the condition of vegetation protected under the NV Act (NVC 2020a,b,c,d). Data collected using the BAM can be used to calculate SEB requirements (offset) once an impact footprint has been determined.

3.1 Desktop Assessment

Initial database searches were undertaken in Spring 2022 prior initial surveys. Combined with regional knowledge, the database survey results were used to highlight specific species to be targeted during field survey (Western Grasswren and Malleefowl) and to undertake likelihood of occurrence assessment for threatened flora and fauna species (with results presented in the Terrestrial Hydrogen Jobs Project Site 1 Terrestrial Ecology Assessment (Jacobs 2023)).

In March 2023, several species were added as threatened under the EPBC Act including Diamond Firetail (*Stagonopleura guttata*), Blue-winged Parrot (*Neophema chrysostoma*) and Southern Whiteface (*Aphelocera leucopsis*). In addition, the Transmission Line Envelope was added to the HJP Project Area and was subsequently broadly re-surveyed in Spring 2023. As such, new database searches were undertaken in Spring 2023 for the Hydrogen Site 1 and Transmission Line Envelope Areas combined with the results presented in the current report as detailed below.

The desktop assessment for the Project included the following:

- An EPBC Act Protected Matters Search Tool (PMST) data output using a 5 km buffer from the boundary of the HJP Project Area (Appendix A1, extracted November 2023).
- A Biological Database of South Australia (BDBSA) records search using a 5 km buffer from the boundary of the HJP Project Area (Recordset: DEWNRBDBSA231024-2 – extracted October 2023 and superseding the previous output extracted in September 2022 (Record set DEWNRBDBSA220921-1).
- Review of Atlas of Living Australia (ALA) (2023) records where there is a paucity of information, or where extra justification was required.
- Review of publicly available literature, including the Species Profile and Threats Database (SPRAT), species recovery plans and Threatened Species Scientific Committee (TSSC) notes.
- Review of DEW's NatureMaps Tool to identify vegetation communities mapped for the area and identify any ecologically significant features that may occur within the HJP Project Area or surrounds.
- Liaison with local stakeholders (e.g. DEW) to obtain updated information about the region.

Results of the desktop assessment were also used, in part, to inform field assessment preparation including BAM site selection and target areas.

3.1.1 Likelihood of Occurrence Assessment

A likelihood of occurrence assessment was undertaken for the threatened communities and threatened and migratory species highlighted in the EPBC PMST output as potentially occurring within the HJP Study Area. The likelihood assessment used findings of the desktop assessment (previous records – BDBSA / Birdlife) and field surveys (species observations, habitat mapping) to identify the likelihood status (unlikely, possible, likely or known to occur in the HJP Project Area) for each of the highlighted species or communities based on the criteria provided in Table 3-1 below.

Table 3-1. Species likelihood of occurrence criteria used in this study

Likelihood Category	Criteria
Unlikely	<ul style="list-style-type: none"> No recent (since 1995) and reliable (< 1 km) BDBSA records within 5 km of the project area, not observed during surveys and survey effort to rule out is considered adequate; or Limited (< 10) historical (<1995) BDBSA records within 5 km of the project area, not observed during surveys, no suitable habitat is known to occur in the project area; or Project area is outside of known range of the species / records are geographically separated, or Multiple (> 10) recent and reliable BDBSA records within 5 km, but the species is migratory with specific habitat requirements that are not available in or directly adjacent the project area (e.g. coastal, wetland), and all records occur within specific habitat areas (e.g. salt pans, beach area) that are in the study area.
Possible	<ul style="list-style-type: none"> No recent and reliable BDBSA records within 5 km of the project area, not observed during surveys, but the species has specific habitat requirements which occur in the project area (i.e. habitat detected during survey); or Few (<10) recent and reliable BDBSA records within 5 km of the project area, not observed during surveys, the species does not have highly specific habitat needs, but suitable habitat is present.
Likely	<ul style="list-style-type: none"> Multiple (>10) recent and reliable BDBSA records within 5 km of the project area, not observed during surveys, the species does not have highly specific habitat needs, but suitable habitat is present; or Few (<10) recent and reliable BDBSA records within 5 km of the project area, not observed during surveys, the species has highly specific habitat requirements which occur in the project area (i.e. habitat detected during survey).
Known	<ul style="list-style-type: none"> Multiple (>10) recent and reliable BDBSA records within the project area and / or within approximately ~ 1 km; the species does not have highly specific habitat needs, but suitable habitat in good condition is present in the project area; or Species has been recorded within the project area during the current surveys

3.2 Field Assessment

To date, six field assessments have been undertaken by Jacobs for large scale infrastructure projects (HJP Project, Port Bonython Hydrogen Export Hub Project and Northern Water Project) in the north-east of the Eyre Peninsula, which has informed this assessment and contributed to vegetation community numbering. The date and high-level description of each survey is described below:

- Survey 1, spring 2021 (5-7 October): A vehicular and foot survey by Jacobs' ecologists was undertaken as part of pre-feasibility planning for the NW Project (Jacobs and GHD in 2021). The survey was undertaken in spring to highlight ecological constraints and provide data for broad mapping of vegetation groups, potential threatened species habitat and potential land management issues. (Included areas near, but not within the HJP Project Area). The findings of this survey are included in this report where relevant.
- Survey 2, spring 2022 (5-13 October): vegetation survey (BAM) and targeted EPBC listed species and communities habitat survey (Western Grasswren, Malleefowl), bird surveys, Song Meter deployment – and included areas within and adjacent the Site 1 Project Area;

- Survey 3, summer 2022 (5-9 December): Follow up 'broad gap fill' vegetation and habitat survey, bird surveys, Song Meter deployment – and included areas within and adjacent the Site 1 Project Area.
- Survey 4, summer 2023 (21-22 February): Broad 'gap-fill' vegetation and habitat survey. (Included areas near, but not within the HJP Project Area).
- Survey 5, spring 2023 (25-26 September): detailed vegetation and habitat mapping of target areas within the Hydrogen Site 1 Project Area and broad assessment of the Transmission Line Envelope.
- Survey 6, spring 2023 (November 5): brief assessment of the proposed sub-station location in the Transmission Line Envelope.

Each field team included two ecologists, including a minimum of one (sometimes two) experienced NVC accredited consultants to undertake assessment under the NV Act, including vegetation assessment and mapping, general fauna observations and habitat classification.

In addition, specialised fauna experts undertook targeted fauna survey including bird surveys, ground searches, call play-back and deployment of Song Meters in relevant locations targeting Western Grasswren.

In spring 2023, more intensive survey of the Site 1 Project Area was undertaken to map vegetation and Western Grasswren habitat potential to a finer scale to assist in mitigation and planning. In addition, the proposed Transmission Line Envelope west of the Lincoln Highway (including the substation east of the highway) was broadly re-assessed.

An indication of the survey effort for BAM sites, Bird Survey sites and Songmeter installation locations is provided in Figure 3-1. with further explanation below.

3.2.1 Vegetation Assessment and classification

Vegetation was assessed in line with the BAM to determine vegetation composition and condition across the HJP Project Area to assist in valuing vegetation, driving mitigation and calculating SEB once infrastructure footprints are known. The BAM enables determination of a Unit Biodiversity Score (UBS) per hectare which is then used with other factors to determine the required value of the SEB.

Following recent more detailed survey, the HJP Project Area has been stratified into 22 BAM Sites, 14 of these being added during recent survey and two additional sample points being installed for existing BAM sites (vegetation associations) to enable more accurate UBS calculation (Figure 3-1, Figure 5-2, Figure 5-3 and Figure 5-4).

BAM Sites have been grouped into broad communities based on broader features and habitat value (Figure 5-1), whilst broad communities are further combined into Major Vegetation Groups based on high level vegetation communities and landform features. Table 4-1 lists the BAM Sites (vegetation associations), Broad Vegetation Communities and Major Vegetation Groups relevant to the HJP Project Area. Major Vegetation Groups were stratified based on major floristic features and landform applicable to arid communities including consideration of the Bushland Condition Monitoring (BCM) manual for EP SA (Milne et al 2008).

During field survey, vegetation was mapped using ESRI "Field Maps" with 'stop and start mapping (rapid assessment)' supported with one or two, one hectare BAM Sample Point intensive assessments in each BAM Site vegetation association. In addition, vegetation was mapped on hard copy aerial photographs. At rapid vegetation/mapping points, vegetation was allocated to an existing BAM site or a new one was established. Photographs were taken and a bird survey may have been undertaken. At BAM Sample Point one hectare quadrats, the following information /data was collected:

- Detailed vegetation description, including structural features such as woodland, open woodland, low open shrubland.
- Photo(s) and coordinate.
- Flora species (exotic and native) and cover / abundance.

- Consideration of fauna habitat characteristics (e.g. hollows, litter level, presence of preferred vegetation as habitat). (See targeted EPBC listed fauna for further detail).
- Consideration of the presence of the Threatened Ecological Community (TEC) Subtropical and Temperate Coastal Saltmarsh in coastal areas.
- Opportunistic identification of the presence of National (EPBC Act) and State (NPW Act) listed flora species and / or suitable habitat through the extent of the surveyed areas.
- Key weeds, areas of disturbance were collected opportunistically throughout the surveyed areas.
- Live data was collected predominantly using ESRI “Field Maps” on phones or *ipads*, supported with collection of data using handheld GPS, cameras and hard copy maps.

Figure 3-1 illustrates the location of the BAM sites and rapid vegetation mapping points across the project area.

3.2.2 Targeted Threatened Fauna Surveys

Threatened fauna targeted surveys focused on two EPBC species, listed as Vulnerable, identified as potentially occurring across the HJP Study Area – Western Grasswren (*Amytornis textilis myall*) and Malleefowl (*Leipoa ocellata*).

Southern Whiteface were not included as a target species for surveys (given their listing under the EPBC Act post bird survey completion), however, the Song Meter method is considered suitable for this species (along with the other bird species recently listed under the EPBC Act), but the species was not recorded. Suitable habitat for this species was considered when collating desktop information and in field surveys post-EPBC Act listing.

Targeted surveys involved:

- Broad high-level habitat suitability assessment and mapping aligned with vegetation mapping;
- Opportunistic and targeted surveys (for individuals, signs of presence);
- Song Meter deployment, for Western Grasswren detection only.

Each of these methods is discussed further below, as well as further assumptions / criteria considered for the different target fauna to date.

In addition, following the surveys and desktop assessment, there are several species that have received EPBC listing following initial desktop assessment and some survey campaigns. Desktop data and survey data has been re-reviewed to inform the likelihood of occurrence assessment for these species.

Bird survey locations are shown in Figure 3-1.



Figure 3-1. Bushland Assessment Methodology (BAM) one hectare Sample Points, Bird survey sites and Song Meter (SM) deployment locations.

3.2.2.1 Bird Surveys

Formal / targeted bird surveys involved one to two surveyors conducting a roaming survey from the chosen location, usually aligning with a BAM assessment sample point or rapid vegetation/mapping point. Surveys were undertaken for a minimum of 20-25 minutes per site for each observer.

Bird surveys were undertaken at two fauna survey sites within the Site 1 Project Area (BS 26 and 76) and three near the Transmission Line Envelope (BS 16, 17, 18 and 67) (see Figure 3-1).

Call-playback was used to elicit calls from Western Grasswren to assist with detecting their presence, however all birds detected at the site were recorded.

Opportunistic records were also recorded for evidence of other fauna as relevant, including pest fauna and common fauna.

3.2.2.2 Song Meter Deployment

Song Meters were deployed to add value and increase data robustness for detection of Western Grasswren (given this species can be elusive) and to enable sufficient hours of data collection whilst surveyors could move to the sites.

Song Meters were deployed at two sites within the Site 1 Project Area (SM06 and SM07) and one site in the north of the Transmission Line Envelope (SM05). An additional two Song Meters were positioned near the Transmission Line Envelope but on the eastern side of the Lincoln Highway within suitable habitat (within the HJP Study Area) and given mobility of fauna these sites are considered relevant to the Project.

A summary of deployment information is provided in Table 3-2 below and locations of sites where Song Meters were deployed is shown on Figure 3-1.

Five Autonomous Recording Units (ARUs), of the Song Meter Mini Bat model (Wildlife Acoustics, 2022), were fitted with an acoustic stub microphone to enable recording of vocal bird species in the audible frequency range (Professional Trapping Supplies, 2022). They were deployed within areas of habitat considered suitable for Western Grasswren (see 3.2.2.3). ARUs were configured to record in the acoustic mode: for one hour either side of sunset and sunrise. In this configuration, for every 24 hours of deployment, each ARU captured four hours of acoustic recordings.

Each ARU was affixed to a tree or other stable object using cable ties. All cable ties were clipped short to avoid the potential for whistling interference in high winds. This model of ARU is synchronised with the GPS reading from the user's smartphone to correctly set sunrise and sunset times. The location of each deployment was also marked using a conventional GPS unit (*Ipad*).

Sites were chosen based on habitat suitability for Western Grasswren (see Table 3-3) and in an open location away from artificial sounds that may interfere with results. Whilst Southern Whiteface were not included as a target species for surveys (given their listing under the EPBC Act post bird survey completion) the Song Meter method is considered suitable for this species also (along with the other bird species recently listed under the EPBC Act), but the species was not recorded. If common birds were observed / confirmed during bird surveys, they were not tabulated as acoustic data. All records (acoustic) and ground surveys were tabulated for threatened species.

Acoustic Analysis

ARUs recorded all data to Secure Digital (SD) cards. The data was then transferred to a laptop computer and backed-up to internal servers. All recordings were processed using Raven Lite 2 bioacoustics analysis software (K. Lisa Yang Center for Conservation Bioacoustics at the Cornell Lab of Ornithology, 2022).

Analyses for these deployments followed the procedure of analysing all recordings for the presence of any fauna species by first detection using a combination of listening through in real time and high-speed visual spectrogram scanning. All audible taxa were noted in the order in which they appear in recordings. Any

unidentified signals were noted and, if they could not be identified by consultation with other ecologists, were documented in analysis notes.

Table 3-2. Song Meter Summary Details

Song Meter Deployment Number	Date and time of deployment (US date format)	GPS Coordinates	Project Area	Location in project area	Western Grasswren Habitat Type
SM05	2022-10-07 4:53	53H 740190 6354303	Transmission Line Envelope	In the funnel shaped area in the north	Atypical
SM06	07/10/2022 4:53	53H 740190 6354303	Site 1 Project Area	Within the centre of the project area, but towards eastern border. Edge BAM22, perimeter with BAM7	Atypical
SM07	07/10/2022 4:14	53H 739754 6347417	Site 1 Project Area	Within the centre of the project area, BAM22	Atypical
SM08	2022-10-07 4:40	53H 740680 6351455	Transmission Line Envelope	East of the Lincoln Highway opposite BAM 81	Atypical (requires ground-truth)
SM23	2022-12-08 6:27	53H 740612 6352911	Transmission Line Envelope	East of the Lincoln Highway north of BAM 32	Atypical

3.2.2.3 Targeted Species Criteria

3.2.2.3.1 Western Grasswren

For Western Grasswren (*Amytornis textilis myall*), assessment involved assessing vegetation for habitat suitability (and mapping as per section 3.2.2), undertaking bird surveys and deploying Song Meters to detect the species during known periods of activity. This is generally between June and September (as per the survey guidelines for Australia's threatened birds, DEWHA 2010). However, in 2022, given the high rainfall and mild season, detection was expected to extend into the summer months and birds were easily detected during early December.

Western Grasswren potential habitat classifications will vary across the landscape and depend on site specific characteristics (e.g. density and cover of dominant species, presence and height / cover of spiny shrubs). Classifications applied were based on the assumptions presented in Table 3-3.

Survey methods included searches in areas of suitable habitat (detection of calls and sightings of birds) early in the morning and afternoon for detecting presence/absence.

As per 3.2.2.2 above, the Song Meters were deployed within areas of suitable habitat and included five sites for a minimum of 16 continuous hours /day at a site depending on survey logistics, usually at least covering a morning and afternoon session. Opportunistic identification of the presence of Western Grasswren or suitable habitat was also implemented throughout the extent of the surveyed areas.

Table 3-3. Western Grasswren habitat criteria (adapted from Jacobs (2019))

Habitat Suitability	Criteria	Rationale
Preferred Habitat (highly suitable)	<p>Total shrub cover 0 – 1 m > 30%;</p> <p>Cover of spiny shrub > 0.5 m, or other dense tall chenopod shrubs (0.5 – 1 m) represents a high proportion of the total shrub cover;</p> <p>Dominant shrub species include <i>Maireana pyramidata</i> (Blackbush), <i>Lycium australe</i> (Australian Boxthorn), <i>Rhagodia spinescens</i>, <i>Atriplex vesicaria</i>;</p> <p>Can occur with Western Myall, Bullock Bush low woodlands (less typical, includes Spiny Fan Flower);</p> <p>For likelihood of use also consider BDBSA / Jacobs records within 5 km and habitat connectivity within the landscape.</p>	<p>Mean shrub cover of sites surveyed by Black et al (2009) which had Grasswrens was 30.6%.</p> <p>Sites with Grasswrens recorded historically have a high cover of shrubs to ground level, provided by dense chenopod shrubs and / or spiny shrubs.</p> <p>The majority of sites with Grasswren recorded by Black et al (2009) had dense Blackbush and / or <i>Lycium australe</i>, with <i>Rhagodia spinescens</i> or <i>R. ulicina</i> and <i>Atriplex vesicaria</i> commonly recorded, and "were generally confined to drainage lines".</p> <p>Black and Gower (2017) Table 4 – Blackbush and Australian Boxthorn low shrublands or open Western Myall and Bullock-bush low woodlands, less commonly Nitre Goosefoot or other shrublands, rarely mallee; Spiny Saltbush common.</p>
Atypical Habitat (also suitable)	<p>Total shrub cover 0 – 1 m > 20%;</p> <p>Cover of spiny shrub > 0.5 m, or other dense tall chenopod shrubs (0.5 – 1 m) represents a high to moderate proportion of the total shrub cover;</p> <p>Dominant shrub species include <i>Maireana sedifolia</i>, <i>Scaevola spinescens</i>, <i>Dodonaea lobulate</i>, <i>Acacia nyssophylla</i>, <i>Atriplex vesicaria</i> +/- shrubs (e.g. <i>Senna</i> sp.);</p> <p>Can occur with Western Myall, Bullock Bush +/- False Sandalwood low woodlands;</p> <p>May include <i>Casuarina pauper</i> with spiny shrubs present.</p> <p>For likelihood of use also consider BDBSA / Jacobs records within 5-10 km and/or habitat connectivity within the landscape.</p>	<p>Black et al. (2009) recorded Grasswrens at a lesser number of sites, described as "atypical", which displayed these characteristics.</p> <p>These sites were not in drainage lines and did not contain Blackbush and/or Australian Boxthorn as dominants (i.e. can occur) but did have a "high cover" of dense spiny shrubs.</p> <p>Jacobs assessment of records versus habitat based on DEW mapping in atypical habitats.</p>
Low Potential (potentially suitable, buffer areas)	<p>Spiny shrubs and/or dense chenopod shrubs present, but at low cover or < 0.5 m tall.</p> <p>Consider BDBSA / Jacobs records not within 20 km and limited to no habitat connectivity within the landscape.</p>	<p>Black et al. (2009) found that habitats in which Grasswren were recorded had a high cover of dense shrubs 0 – 1 m tall.</p>
Not Suitable	<p>Total shrub cover 0-1 m is very low; spiny shrubs are not present or <1% cover.</p> <p>Consider BDBSA / Jacobs records not within 20 km and limited to no habitat connectivity within the landscape.</p>	<p>Lack key shrub cover, species mixes and densities of preferred / atypical habitats.</p>

3.2.2.3.2 Malleefowl

For Malleefowl (*Leipoa ocellata*), survey included assessing vegetation for habitat suitability (as per Table 3-4), undertaking bird surveys, and opportunistic detection of Malleefowl mounds. Bird surveys involved area searches in suitable mallee habitat looking for sightings of individuals, tracks and their distinctive active or inactive nest mounds. Detailed Malleefowl transects were not undertaken.

Habitat suitability categories and criteria are summarised in Table 3-4 and are based on vegetation type, leaf litter cover, substrate type and if sand present, depth of sand. With preferred habitat for this species being shrublands and low woodlands (especially those dominated by Mallee and/or Acacias) with sandy deep soils and an abundance leaf litter, which are required for building their mounds / breeding (National Malleefowl Recovery Team, 2019). Over the course of a year the birds may range over one to several square kilometres; home-ranges overlap considerably. Opportunistic identification of the presence of Malleefowl or suitable habitat was also implemented through the extent of the survey area during vegetation assessments.

Table 3-4. Malleefowl habitat criteria

Habitat Suitability	Criteria
Preferred Habitat (nesting and foraging)	Large tracts of long unburnt Mallee with an abundance of leaf litter and deep sandy soils for nesting (creation of Malleefowl mounds) and foraging
Suitable Habitat (foraging only)	Mosaics of burnt / unburnt mallee and adjacent habitats over sand or limestone substrates. Diversity of flora species for foraging. Adjacent areas of Mallee suitable for nesting.
Not suitable	Distant from Mallee or known records

3.3 Assessment limitations

Limitations related to the desktop and field assessments are as follows:

- The likelihood assessment is based on data available at the time of the assessment in addition to the team's professional knowledge and expertise. However, it is possible there are inaccuracies with the available data and/or that species occur that have not been identified. However, most/all species that could occur in the vicinity have been considered;
- Additional bird species were added to the EPBC Act on 31 March 2023, post completion of the bird surveys. Whilst these species would have been detected through Song Meter recordings, bird surveys (if present at those sites) and opportunistically, they were not initially considered as potential target species for surveys and / or habitat mapping.
- Vegetation was surveyed on ground where feasible, but given the very large scale and linear nature of the Project, a range of techniques were applied to vegetation and habitat mapping including on-ground vegetation survey (BAM), rapid point sampling and factors such as review of DEW vegetation mapping / review of aerial imagery / site knowledge and species distribution to predictive map. (The Site 1 Project Area is considered to have relatively high-level ground-survey validation. However, the Transmission Line Envelope was subject to only broad survey with targeted sampling in accessible areas in the timeframe, therefore BAM site stratification and habitat mapping is expected to have limitations through this area. Regardless, it is considered sufficient information was collected to enable calculation of a UBS and broadly quantify habitat suitability for target species.)

4. Desktop Results

4.1 Landscape context and natural features of the Hydrogen Jobs Plan Project Area

4.1.1 Regional Context and land use

The Site 1 Project Area and parts of the Transmission Line Envelope outside of the Whyalla CP occur within land mapped and described as being used for 'Production from Relatively Natural Environments – Grazing native vegetation' (NatureMaps 2023). Land use within the portion of the Transmission Line Envelope that occurs within the Whyalla CP is defined as 'Conservation and Natural Environments'. East of the Lincoln Highway in the area broadly surveyed but not included in the current HJP Project Area, land use is a combination of 'Production from Relatively Natural Environments – Grazing native vegetation' and 'Conservation and Natural Environments'. Two large water tanks are located on a stony calcrete rise in the south of the Site 1 Project Area used as a reference point in this report and referred to as the "Whyalla water tanks". South east of the HJP Project Area is an area of intensive industry including manufacturing and industrial production.

Land in the Transmission Line North of the Whyalla CP is also combined Tregolana Pastoral Lease used for grazing in addition to being part of the DoD Cultana training area. To the west of Tregolana is the Roopena and Myola/Iron Baron Pastoral Leases.

Directly west of (and marginally within) the Site 1 Project Area is Heritage Agreement 1588 which is also an SEB under the NV Act (SEB 2007_2001) which both extend to just west of the Whyalla water tanks (Figure 4-1).

There are no other protected areas within 20 km of the project area. Lake Gilles Conservation Park and Ironstone Hill Conservation Park occur approximately 70 km west and 48 km south-west of the HJP Project Area respectively.

4.1.2 IBRA Bioregions

The Interim Biogeographic Regionalisation for Australia (IBRA) was developed in 1993 as a key tool for identifying land for conservation under Australia's Strategy for the National Reserve System (Thackway and Creswell 1995). The IBRA stratifies Australia into 89 bioregions and 419 subregions (DCCEEW 2023a).

Each bioregion is a distinct area characterised by a combination of characteristics such as geology, landform patterns, climate, ecological features, and plant and animal communities. The HJP Project Area occurs across a single IBRA Region, Gawler (GAW); and a single IBRA Sub-region (Myall Plains (Figure 4-1). It should be noted that IBRA Sub-regions are stratified further into IBRA Associations driven by geology, landform and vegetation communities which have not been updated for the most recent version of IBRA classification (Version 7) but are used calculating SEB requirements under the NV Act. As such, the previous version of the IBRA Associations (Version 6) is used to describe land features and will be used to calculate SEB requirements for the HJP Project Area once the impact is known. Figure 4-1 indicates the IBRA regions (inset) and the IBRA Sub-regions (V7) and IBRA Associations (V6) in the HJP Project Area.

The Site 1 Project Area is positioned just north of the junction of three IBRA Associations: Red Rock to the west and including the western half of the Site 1 Project Area, Tregolana to the east including the Transmission Line Envelope, and Whyalla south of the Site 1 Project Area. This unusual junction of three IBRA Associations (and therefore three distinct landforms) has resulted in the HJP Project Area supporting a diverse range of landforms and floristic communities.

The IBRA regions, Sub-regions and IBRA Associations Version 6 are described further below.

4.1.2.1 Gawler IBRA Bioregion

The Gawler IBRA Bioregion is characterised by semi-arid to arid flat topped to rounded hills, rocky quartzite hills, sandstone plateaus, depositional plains, gibber plains and salt-encrusted lake beds. Typical vegetation includes open woodlands of Blackoak and Myall, open mallee scrub, chenopod shrublands (Bluebush / Saltbush) and tall Mulga shrublands. The native vegetation across the area is generally relatively intact, but in some areas, particularly near stock watering points, it is highly disturbed.

The environment of the region has been influenced by pastoral activities and infrastructure (e.g. sheep and cattle stations) and mining operations, as well as the construction and operation activities of the Woomera Rocket Range. Grazing by livestock and rabbits has led to extensive habitat modification across the region and coupled with the introduction of predators such as foxes and cats, has resulted in the extinction of many small to medium sized mammals. Weeds are present in the region, primarily in disturbed areas.

Other landscape features incorporated in the Gawler classification include (NatureMaps 2023):

- Erosional, depositional or volcanic landtypes, with depositional plains
- Plains broken by hills and ridges, some dune tracts, saline flats, clay pans, seasonal swamps
- Lakes ringed on the eastern margins by lunettes
- Brown calcareous earths, siliceous sand, loamy soils with weak pedologic development, and
- Geology of the bioregion as sand mantle with minimal soil development, dune sands, outcrops of bare rock; clay silt and sand in alluvial and seasonal swampy lowlands, gypsum and halite deposits, some kopi dunes, silcrete & ferricrete development and deeply weathered Palaeozoic basement.

4.1.2.1.1 Myall Plains IBRA Sub-region

The HJP Project Area occurs in the Myall Plains IBRA Sub-region. The Sub-region is characterised by vast plains of chenopod shrubland with emergent trees tending to lower chenopod shrublands in coastal areas and a narrow coastal strip with samphire low open shrubland encroaching on tidal areas and mangrove forests in tidal areas.

The Sub-region also supports mixed open woodlands of Western Myall, Blackoak and False Sandalwood and smaller patches of mallee on plains and low sand dunes.

Particular vegetation communities within the Myall Plains Sub-region provide the predominant habitat for Nationally Vulnerable Western Grasswren. Some Mallee communities also provide habitat for Nationally Vulnerable Malleefowl. Broad vegetation communities found in this sub-region include:

- Sandy loam plains with *Acacia papyrocarpa* (Western Myall) / *Myoporum platycarpum* (False Sandalwood) / *Casuarina pauper* (Blackoak) low open woodland over Chenopod low open shrubland (some communities with taller spiny shrubs and / or with *Maireana pyramidata* providing habitat to Western Grasswren); Chenopod shrublands of *M. pyramidata* (Black Bluebush), *M. sedifolia* (Pearl Bluebush) and *Atriplex vesicaria* (Bladder Saltbush) with emergent trees (some communities with taller spiny shrubs providing habitat to Western Grasswren)
- Low dunes and sand plains with *Eucalyptus oleosa* (Red Mallee) / *E. gracilis* (White Mallee) / *E. socialis* (Summer Red Mallee) open mallee over Chenopod shrubs with and without *Triodia* spp. (Spinifex) (some communities providing habitat to Malleefowl)
- Low open chenopod shrublands of *M. sedifolia*, *A. vesicaria* and *Tecticornia medullosa* (Samphire) in coastal areas or in small patches on tableland landforms
- Saline clay plains subject to tidal inundation with *Tecticornia* spp. (Samphires) low open shrubland (some areas may represent EPBC listed Coastal Saltmarsh)
- Low coastal dunes and sandplains with *Olearia axillaris* (Coastal Daisy) / *Alyxia buxifolia* (Sea Box) open shrubland
- Tidal channels with *Avicennia marina* ssp. *marina* (Grey Mangrove) tall shrubland (minor occurrence).

4.1.2.1.1.1 Red Rock IBRA Association

The Red Rock IBRA Association is described as Hills on conglomerate with long dissected footslopes with dense brown loams, hard pedal red duplex soils and crusty red duplex soils supporting Low open woodland of myall and myall and black oak" (DEW spatial dataset 2022). During field survey it was found this Association supported stony hills with low open shrublands of *Maireana sedifolia*, tall diverse shrublands on stony hills and plains of chenopod shrublands with *M. sedifolia* (Pearl Bluebush), *M. pyramidata* (Black Bluebush) with patches of *Myoporum platycarpum* (Sugarwood) woodland tending to *Acacia papyrocarpa* (Western Myall) and *Casuarina pauper* (Blackoak) open woodlands north of the Whyalla water tanks.

4.1.2.1.1.2 Tregolana IBRA Association

The Tregolana Association is described as supporting "Undulating plains with occasional low sand dunes and pans and some samphire or mangrove flats with sand, gravel and alluvium with red calcareous earths, reddish sands, crusty red duplex soils and grey calcareous loams supporting low woodland of Myall and Black oak, chenopod shrubland of saltbush and bluebush, chenopod shrubland of samphire and low woodland of mangroves" (DEW spatial dataset 2022). In the HJP Project area, this Association was found to support level plains of chenopod shrubland of *Maireana sedifolia* or *M. pyramidata* and open woodlands of *Acacia papyrocarpa* and *Casuarina pauper*.

4.1.2.1.1.3 Whyalla IBRA Association.

The Whyalla Association is described as "Easterly sloping calcrete plain with occasional hills on outcropping conglomerate, and with mangrove flats along the coastal margin with Calcrete, conglomerate, silts, metasediments and sands on Red calcareous earths, dense brown loams, grey calcareous loams and whitish calcareous sands supporting Low open woodland of black oak and myall sometimes with false sandalwood, low woodland of mangrove and chenopod shrubland of samphire" (DEW spatial dataset 2022). This association occurred south of the HJP Project Area, but in this location was found to support undulating plains of *Maireana pyramidata* and level plains of *Acacia papyrocarpa* over *M. sedifolia* and *M. pyramidata*.

4.1.3 Native vegetation

The majority of the HJP Project Area is mapped as remnant native vegetation based on the DEW vegetation mapping layers (Native Vegetation Cover, SA Vegetation, NatureMaps 2023). The location and extent of the vegetation associations from this layer are summarised in Table 4-1 and shown in Figure 4-1.

Table 4-1. Vegetation communities present within the project area (NatureMaps layer)

Vegetation Community	General Location in the project area
Acacia Woodland	Occurring as a single patch covering most (70%) of the project area, particularly through the middle of the project area.
Chenopod Shrubland	Remainder (30%) of the project area, occurring as patches around the large Acacia Woodland area.

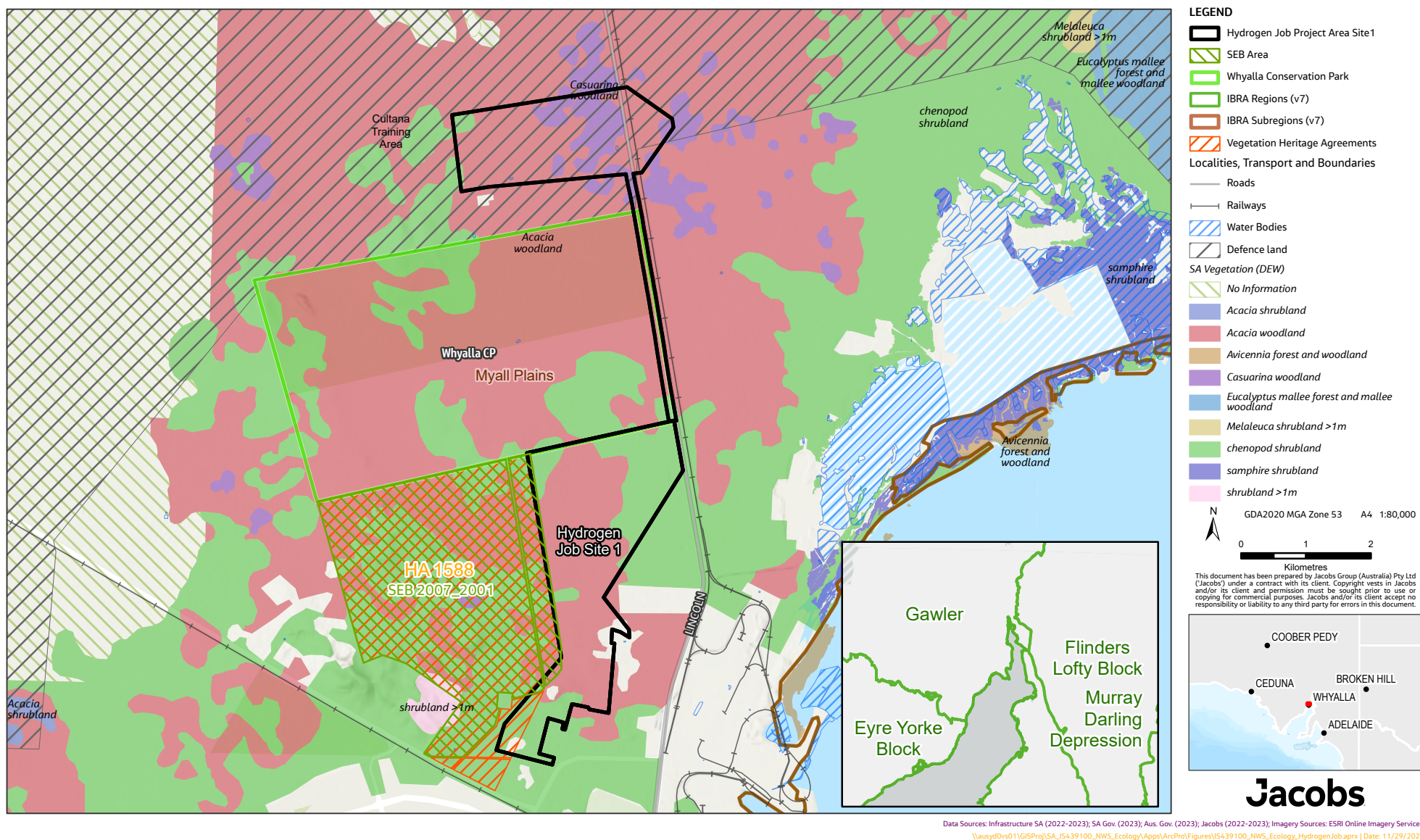


Figure 4-1 Department for Environment (DEW) remnant vegetation mapping in the HJP Project Area and surrounds (DEW / NatureMaps 2023)

4.1.4 Surface water

A few minor drainage lines are present across the centre and south-west sections of the HJP Project Area. To the east, in False Bay, there are a number of perennial and an intermittent lakes where samphire shrubland occurs adjacent the evaporating ponds, and includes land subject to tidal inundation. There is also land subject to inundation along the coast south of Whyalla. Water features are included in Figure 4-1.

4.1.5 Climate

The EP LMR experiences a semi-arid climate, with fairly low annual rainfall (201-300 mm, NatureMaps 2023). Mean annual rainfall is around 266-276 mm (Whyalla Norrie (018103)) and Whyalla Aero stations (018120) and average monthly rainfall is similar across the year.

Annual rainfall has been stable, while rainfall in autumn and spring months has been decreasing since 1988 (Bureau of Meteorology (BOM) 2023). Mean minimum annual temperature is 13°C and maximum 23.3°C, with coolest temperatures experienced in July (5-7°C min and 17 °C max) and warmest in January/February (around 18 °C min and 30 °C max).

Figure 4-2 summarises the climate data for the Whyalla Aero station.

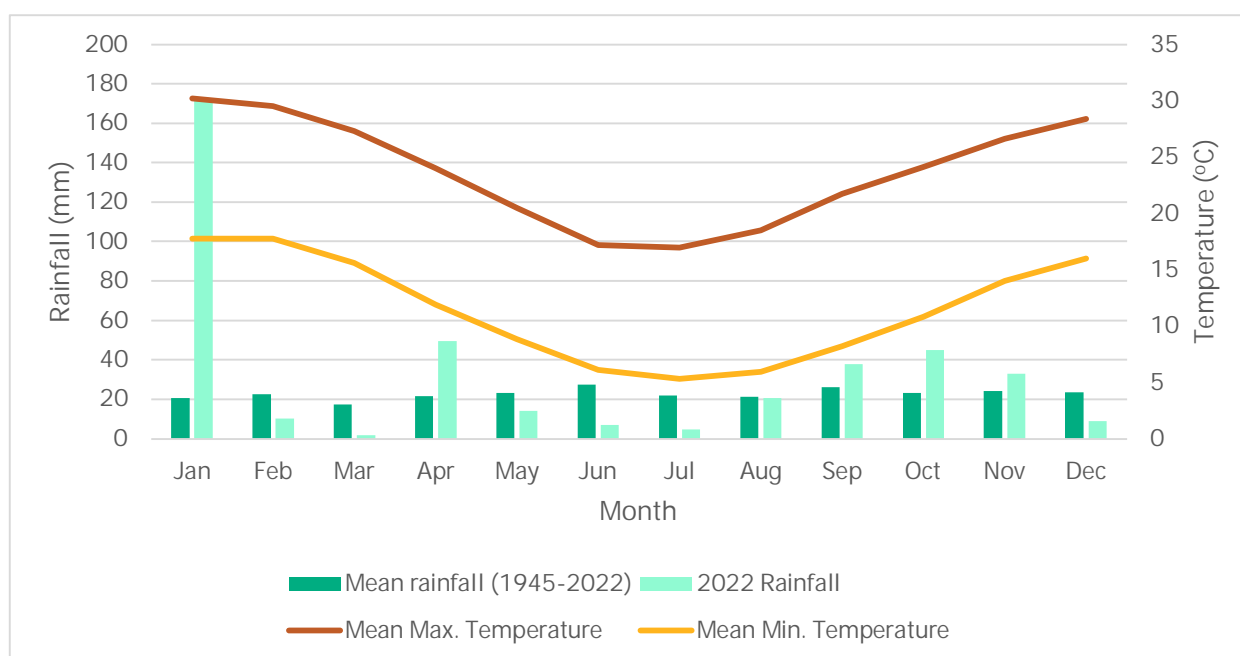


Figure 4-2. Climate data showing mean maximum and minimum temperatures and rainfall for the project area. Whyalla Aero meteorological station (station 18120) (BOM 2023)

4.2 Matters of National Significance

The EPBC PMST search, extracted November 2023, highlighted a number of threatened communities, flora and fauna species with potential to occur within the HJP Study Area (refer Appendix A). A summary of the PMST output is provided below, along with a likelihood of occurrence assessment for these species.

4.2.1 Threatened Ecological Communities

The EPBC PMST highlighted a single Threatened Ecological Community (TEC) as likely to occur within the project area, *Subtropical and Temperate Coastal Saltmarsh* (VU) (Table 4-2). The Subtropical and Temperate Coastal Saltmarsh community is dominated by salt-tolerant vegetation including grasses, herbs, sedges, rushes and shrubs generally less than 0.5m in height (DSEWPC, 2013).

The community occurs within a narrow margin of the Australian coastline, in areas under regular or intermittent tidal influence or in areas that have groundwater connectivity to tidal water bodies. It is noted that areas that are 'stranded' are not considered to form part of the ecological community (refer page 17 of Conservation Advice DSEWPC, 2013). The HJP Project Area is away from the coast and therefore this TEC is not relevant to the site.

The samphire / mangrove areas associated with Coastal saltmarsh would provide habitat for shorebirds (buffers to core tidal areas), but it is not anticipated that the Project would impact these areas given the level of separation.

Table 4-2. Threatened Ecological Communities highlighted by the PMST

Community Name	EPBC Rating ¹	Likelihood Assessment	Justification
Subtropical and Temperate Coastal Saltmarsh	VU	Unlikely	PMST suggests likely to occur in project area. Closest areas of Coastal Saltmarsh occur >2.5 km from the project area (E/NE and SE along the coast). The project area is separated from these saltmarsh areas by conservation land, Whyalla township, the Lincoln Highway, and areas used for industry and recreation/culture.

¹EPBC Act status: Endangered (E); Critically Endangered (CE); Vulnerable (VU).

4.2.2 Threatened flora

The PMST highlighted three threatened EPBC listed flora species as potentially occurring within the HJP Study Area based on a 5 km query. There are no recent and reliable records within the HJP Study Area for these species and based on habitat preferences and known records it is deemed that all three highlighted flora species are considered unlikely to occur within the HJP Project Area. The EPBC PMST output and BDBSA data results, along with the likelihood assessment are included in Table 4-3.

Table 4-3. Likelihood of occurrence of threatened flora species highlighted by the PMST as potentially occurring in the project or study area

Species	EPBC Rating ¹	NPW Rating ²	Likelihood of Occurrence	Justification
<i>Frankenia plicata</i> Sea Heath	E	V	Unlikely	Small shrub known from a limited number of scattered records from a variety of environments in run-on areas across the arid zone of SA (DEWHA 2008, ALA 2023). Grows in a range of habitats, in a wide range of vegetation communities that have good drainage (Neagle, 2002). The SA Herbarium has undertaken review of lodged specimens that were mis-identified given the difficulty in separating this species from the common <i>F. serpyllifolia</i> . The SA Flora database and MNES distributions will be updated to reflect this. PMST highlighted as may occur in the project area. There are no previous records within 5 km of the project area. Was not detected during surveys.
<i>Pterostylis xerophila</i> Desert Greenhood	VU	V	Unlikely	Distribution is restricted to isolated populations across the Mediterranean zone from Eyre Peninsula (SA) to western Victoria (ALA 2023, Hutchinson et al. 2005). It is difficult to detect as tubers remain dormant below ground until years with favourable rainfall and growing season only lasts a few months.

Species	EPBC Rating ¹	NPW Rating ²	Likelihood of Occurrence	Justification
				<p>Has been located within areas mapped as <i>Eucalyptus incrassata</i> mid mallee woodland (BDBSA 2022, NatureMaps 2023). However, it is more typically associated with <i>Melaleuca uncinata</i> (Broombush) tall shrubland over <i>Babingtonia behrii</i> +/- <i>Calytrix involucreata</i> low shrubs over <i>Triodia irritans</i> +/- <i>Hibbertia</i> sp (DJ Whibley 9012), typically associated with granite outcropping (cited in JBSG 2022).</p> <p>PMST highlighted as may occur in the project area.</p> <p>There are no previous records within 5 km of the project area. Was not detected during surveys and there is no suitable habitat within the project area.</p>
<i>Swainsona pyrophila</i> Yellow Swainson-pea	VU	R	Unlikely	<p>Grows in mallee scrub on sandy or loamy soil. Has been recorded within <i>Eucalyptus brachycalyx</i> mallee woodland on plains and on areas mapped as <i>E. incrassata</i> mallee woodland. Occurs across a wide variety of habitats and is known to respond favourably to disturbance (GHD 2004, Badman 2004) and after fire and subsequent rain (Jeanes 1996; Tonkinson & Robertson 2010).</p> <p>PMST highlighted as may occur in the project area.</p> <p>There are no previous records within 5 km of the project area. Was not detected during surveys, and there is no suitable habitat within the project area.</p>

¹EPBC Act status: Endangered (E); Critically Endangered (CE); Vulnerable (VU).

²South Australian National Parks and Wildlife Act 1972 status: Endangered (E); Vulnerable (V); Rare (R).

Records from Biological Databases of SA. Recordset number: DEWNRBDBSA231024-2, only recent (since 1995) and reliable (< 1km) records included. Record distances presented are approximate, based on the project alignment provided in February 2023.

4.2.3 EPBC Threatened fauna

The PMST highlighted 38 threatened fauna species as potentially occurring within the HJP Project Area, of these 19 are oceanic or marine species that are excluded and not considered further (11 birds (Albatross, Petrels or Prions), two mammals (whale, sea-lion), two fish, three turtles and one shark). The remaining 18 species were considered further by a likelihood assessment, including 16 birds, one mammal and one reptile.

There are previous recent and reliable records for eight of the EPBC threatened bird species within 5 km, including two records within the HJP Project Area for Southern Whiteface (*Aphelocephala leucopsis*, VU), one north of the Whyalla water tanks and another in the north of the Transmission Line Envelope. There are no historical records for Western Grasswren (*Amytornis textilis myall*, VU) in the HJP Project Area, but there are multiple records in the adjacent Whyalla CP. Further, the species was observed during the current surveys and is therefore considered known to occur.

Other species with records within 5 km include coastal and wetland species Curlew Sandpiper (*Calidris ferruginea*, CE MW), Nunivak Bar-tailed Godwit, (*Limosa lapponica baueri*, VU), Eastern Curlew (*Numenius madagascariensis*, CE MW), Australian Fairy Tern (*Sternula nereis*, VU), all of which were observed at the Whyalla salt pans, wetlands, old rubbish dump, boat ramp and beach. There was also one observation of Grey Falcon (*Falco hypoleucos*, VU), 3km west of the Transmission Line Envelope in the Whyalla CP (2011). An observation of Malleefowl (*Leipoa ocellata*, VU) within 5 km has been disregarded as it was recorded in the centre of Whyalla with poor spatial reliability of 1-10 km. Furthermore, there is no suitable habitat for this species in the HJP Project Area. There are no records for any EPBC listed mammals or reptiles within 5 km.

Following the likelihood assessment it is considered that two species, Western Grasswren and Southern Whiteface are known to occur within the HJP Project Area.

Western Grasswren were seen and heard a number of times in the HJP Project Area during the surveys, particularly near the Whyalla water tanks (BAM 29, 58, 44) and north along the pipeline track (BAM 22). Western Grasswren habitat is widespread through and discussed more in Table 4-4 and Section 5.5. Habitat mapping provided on Figure 5-6 and Figure 5-7 indicates existing database records and new records of the species observed, heard or recorded during Jacobs surveys.

Two records of Southern Whiteface occur in the HJP Project Area and there are multiple records nearby in the Whyalla CP, in addition to records in the adjacent HA 1588 and SEB 2007_2001 (see Figure 5-7) with habitat preferences for the species described further in Table 4-4 and Section 5.5.

Two bird species are considered as possible occurrences in the HJP Project Area, including Grey Falcon (*Falco hypoleucos*, VU) and Blue-winged Parrot (*Neophema chrysostoma*, VU). Newly listed Diamond Firetail (*Stagonopleura guttata*) were considered in the likelihood assessment and but the nearest records are in the Flinders Ranges in different habitat and 65km away on EP, therefore this species is considered unlikely to occur.

All other remaining fauna species included in the assessment are considered unlikely to occur, including the targeted Malleefowl and several wetland / coastal / shorebirds due to a lack of suitable habitat and/or lack of records near the HJP Project Area. However, some species may fly over the site occasionally. The one mammal species, Sandhill Dunnart (*Sminthopsis psammophila*, E) and one reptile species, Flinders Ranges Worm-lizard (*Aprasia pseudopulchella*, VU), identified in the PMST search, are also considered unlikely as the HJP Project Area occurs outside of the known range of the species, and due to a lack of suitable habitat and records.

The EPBC PMST output and BDBSA data results, along with the likelihood assessment are included in Table 4-4. EPBC listed Threatened Fauna species for the HJP Project Area are displayed on Figure 5-7 along with Western Grasswren observation sites (during Jacobs surveys).

Table 4-4. Likelihood of occurrence of threatened fauna species highlighted by the PMST as potentially occurring in the HJP Project Area of HJP Study Area

Species ⁴	EPBC rating ¹	NPW Rating ²	Likelihood of Occurrence	Justification ³
Birds				
<i>Amytornis textilis myall</i> Western Grasswren (Gawler Ranges)	VU	V	Known	<p>PMST suggests known to occur in HJP Project Area.</p> <p>Prefers low shrublands, chiefly comprising Blackbush (<i>Maireana pyramidata</i>) and Australian boxthorn (<i>Lycium australe</i>), however they also inhabit low woodlands, mostly comprising Western Myall (<i>Acacia papyrocarpa</i>) (Black et al., 2009). Preferred habitats are on drainage lines, low rocky hills and semi-arid woodlands.</p> <p>BDBSA: 42 records (2006-2019) including one within 1 km, off Iron Knob Road and numerous in Whyalla CP and HA 1588.</p> <p>Birdlife: 26 records (1999-2019), Whyalla CP.</p> <p>Habitat throughout the project area is considered preferred to atypical (suitable) for Western Grasswren (see Figure 5-6). Those areas with taller chenopod shrubs (<i>M. pyramidata</i>) are particularly suitable (BAM 22, BAM 57, BAM 29), while those with lower chenopods (<i>M. sedifolia</i>) and sparser shrub cover such as in the south of the project area (BAM 21), the north-east of the (BAM 54, BAM 55, BAM 51 part) and on higher areas and slopes are less suitable.</p> <p>This species was detected during surveys, with a number of individuals (>10) either heard or observed near the Whyalla water tanks (western side) associated with BAM sites 29, 44, 58.</p>

Species ⁴	EPBC rating ¹	NPW Rating ²	Likelihood of Occurrence	Justification ³
				An individual was also heard at WGW14 along the Eastern boundary of project area (near SM07, in BAM22).
<i>Aphelocephala leucopsis</i> Southern Whiteface	VU	-	Known	<p>PMST suggests known in the HJP Project Area.</p> <p>Species was added to the threatened fauna list under the EPBC Act on 31 March 2023 - population has declined substantially by an estimated 30 to 50% every ten years since 1999, with no indication that the declines are slowing (Ehmke et al. 2021, cited in DCCEEW 2023c).</p> <p>Occurs across Australia from the coast of central Western Australia to the coast of central New South Wales, including most of South Australia (north-eastern corner is occasional range (Readers Digest 1977, Davies et al. 2022). Previously common on the edge of dusty country roads with trees nearby, foraging on the ground, preferably where there is less grass cover, feeding on seeds and insects. Nearby trees are used for roosting, perching and avoiding predators (e.g. cats). They are sedentary, occurring in small family groups up to flocks of 20 and often with thornbills (Readers Digest 1977, Menkhorst et al. 2017). Whilst the species is widespread, their distribution is patchy in woodlands and tall shrublands with grassy / low shrub layers (Menkhorst et al. 2017).</p> <p>BDBSA: 13 records (2011-2021) including two in the HJP Project Area (2011, BAM 22) and 11 within 5 km of the project area (Whyalla CP, HA1588, Cultana Training Area).</p> <p>Birdlife: 22 records (1999-2020) within 5 km of project area, all in Whyalla CP.</p> <p>There is suitable habitat in the project area in the woodland and tall shrubland areas. This species was not observed during recent surveys in the project area and study area. However, it was observed more broadly in the project area for the Northern Water Supply Project and is known from the region.</p>
<i>Calidris canutus</i> Red Knot, Knot	E, MW	E (ssp. <i>rogersi</i>)	Unlikely	<p>PMST suggests known to occur in HJP Project Area.</p> <p>Migratory bird, which does not breed in Australia (breeds in Siberia). When in Australia (Sept/Oct – March/April) occurs on extensive intertidal mud flats and rarely ventures inland (Geering et al. 2008).</p> <p>No previous records within 5 km of the project area. No suitable habitat within or directly adjacent the project area.</p>
<i>Calidris ferruginea</i> Curlew Sandpiper	CE, MW	E	Unlikely	<p>PMST suggests known to occur in HJP Project Area.</p> <p>This migratory shorebird prefers coastal or inland mudflats but will also visit artificial dams and inland water habitats, freshwater and brackish wetlands (Simpson & Day 2019, Menkhorst et al. 2017).</p> <p>A common summer migrant widespread across Australia, in spring and summer, but does not breed in Australia (Geering et al. 2008, ALA 2023). Juveniles remain in Aus for first Austral Winter (2 years old) (Menkhorst et al. 2017).</p>

Species ⁴	EPBC rating ¹	NPW Rating ²	Likelihood of Occurrence	Justification ³
				<p>It is most common in the far south-east and north-west of Australia.</p> <p>BDBSA: Three records (2000-2019) and three previous Birdlife records (2005-2006) within 5 km of the project area in Whyalla saltpans and beach.</p> <p>No suitable habitat within or directly adjacent the project area.</p>
<i>Calidris tenuirostris</i> Great Knot	CE, MW	E	Unlikely	<p>PMST suggests known to occur in the HJP Study Area.</p> <p>Migratory bird that does not breed in Australia. Prefers sheltered coastal habitats, with large intertidal mudflats or sandflats, including natural environments along and close to the coast, and artificial environments such as ponds in saltworks (Geering et al. 2008; DCCEEW 2023b).</p> <p>No previous records within 5 km of the project area. No suitable habitat within or directly adjacent the project area.</p>
<i>Charadrius leschenaultia</i> Greater Sand Plover, Large Sand Plover	VU, MW	R (ssp. <i>leschenaultia</i>)	Unlikely	<p>PMST suggests likely to occur in the HJP Project Area.</p> <p>Early migratory bird that visits Australia (Aug-March) and remains in Aus for first austral winter. Occurs in tidal flats and roosts on beaches at high tide (Menkhorst et al. 2017).</p> <p>Occurs in a range of natural environments along and close to the coast, and artificial environments such as ponds in saltworks (DCCEEW 2023b).</p> <p>No previous records within 5 km of the project area. No suitable habitat within or directly adjacent the project area.</p>
<i>Falco hypoleucos</i> Grey Falcon	VU	R	Possible	<p>PMST suggests known to occur in the HJP Project Area.</p> <p>A rare pale falcon. Preferred habitat includes open plains and treed watercourses in arid inland areas. When not actively hunting roosts in shady trees or communications towers (Menkhorst et al. 2017).</p> <p>The species has a widespread, but sparse distribution across Australia (ALA 2023).</p> <p>Birdlife: One previous record 3 km west of the Transmission Line Envelope in Whyalla CP (2011).</p> <p>No preferred 'tree -lined' watercourses present in the HJP project Area, but given it is a raptor may occasionally utilise open (chenopod) areas for hunting.</p>
<i>Leipoa ocellata</i> Malleefowl	VU	V	Unlikely	<p>PMST suggests known to occur in the HJP Project Area.</p> <p>Terrestrial ground-dwelling species which makes large conspicuous nesting mounds. Preferred habitat is semi-arid to arid shrublands and low woodlands (especially those dominated by mallee and/or Acacias). Sandy soils and abundance leaf litter are required for breeding.</p> <p>BDBSA: One previous record in the centre of the Whyalla township with poor spatial reliability (1999).</p> <p>There are no previous records within 5 km of the project area. There is no suitable mallee habitat for this species within the</p>

Species ⁴	EPBC rating ¹	NPW Rating ²	Likelihood of Occurrence	Justification ³
				project area and presence of this species (individuals, mounds) was not detected during the surveys.
<i>Limosa lapponica baueri</i> Nunivak Bar-tailed Godwit, Western Alaskan Bar-tailed Godwit	VU	R	Unlikely	PMST suggests may occur in the HJP Project Area. The sub-species occurs in intertidal sandflats and mudflats and forages at the edge of water in soft mud. Rarely far from the coast, restricted to large intertidal sites (Geering et al. 2008). Birdlife: One previous record (2004) within 5 km of the project area at Whyalla Wetlands. No suitable habitat within or directly adjacent the project area.
<i>Neophema chrysostoma</i> Blue-winged Parrot	VU	V	Possible	PMST suggests as likely to occur in the HJP Project Area. Species was added to the threatened fauna list under the EPBC on 31 March 2023 as the population appears to have declined by 30–50% in three generations (DCCEEW 2023d). Blue-winged parrots breed on mainland Australia south of the Great Dividing Range in southern Victoria, and sometimes in the far south-east of South Australia, and the north-western, central and eastern parts of Tasmania. 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 (Higgins 1999 cited in DCCEEW 2023d). Inhabits a range of habitats from coastal, sub-coastal and inland areas, through to semi-arid zones. Favour grasslands and grassy woodlands and are often found near wetlands both near the coast and in semi-arid zones (Higgins 1999; Holdsworth et al. 2021). The species can also be seen in altered environments such as airfields, golf-courses and paddocks. Will also forage on saltmarsh (Davies et al. 2022). The project area occurs within the species occasional range. No previous records within 5 km of the project area. There is no preferred habitat within the project area. However, open chenopod areas may be suitable, during periods of inland migration. This species was not observed during the surveys of the project and study area.
<i>Numenius madagascariensis</i> Eastern Curlew, Far Eastern Curlew	CE, MW	E	Unlikely	PMST suggests known to occur in the HJP Project Area. Migratory wader / large shorebird. Breeds in NE Asia, Siberia and is a spring migrant to Australia where it is found in all states. Within Australia, has a primarily coastal distribution, with very few inland records. Its preferred habitat is coastal lakes, inlets, bays and estuaries where it occupies intertidal mudflats, particularly exposed seagrass beds. One BDBSA record (2006) within 5 km of the project area in the Whyalla old rubbish dump. Two Birdlife records within 5 km (2000-2006). No suitable habitat within or directly adjacent the project area.

Species ⁴	EPBC rating ¹	NPW Rating ²	Likelihood of Occurrence	Justification ³
<i>Pedionomus torquatus</i> Plains-wanderer	CE,	E	Unlikely	<p>PMST suggests may occur in the HJP Project Area.</p> <p>Plains-wanderers inhabit sparse grasslands with c.50% bare ground, with most vegetation less than 5 cm in height and some widely spaced plants up to 30 cm high (Garnett et al., 2011). The main threat to plains-wanderers is cultivation of native grassland which, even if left to recover, remains unsuitable for decades (Garnett et al., 2011). Cultivation has all but eliminated the species from southern South Australia and Victoria and is increasing across the NSW Riverina (Garnett et al., 2011).</p> <p>The species is incredibly rare with few observations in SA and only three on the EP, two from the 1980, the nearest being 153.3 km to the south west (1982) and the most recent at Venus Bay in 2002. few observations. There are no records for the species within 5 km of the Project Area.</p> <p>Given the lack of suitable habitat and the rarity of the species, it is considered unlikely to occur.</p>
<i>Rostratula australis</i> Australian Painted Snipe	E	E	Unlikely	<p>PMST highlighted as may occur in the HJP Project Area.</p> <p>This elusive bird occurs in freshwater wetland habitats with dense reeds and rushes/ well vegetated margins (Simpson and Day 2010, Menkhorst et al. 2017).</p> <p>Has a widespread distribution across eastern and northern Australia (ALA 2023).</p> <p>No previous records within 5 km of the project area. No suitable habitat within the project area.</p>
<i>Stagonopleura guttata</i> Diamond Firetail	VU	V	Unlikely	<p>PMST highlighted as may occur within the HJP Project Area.</p> <p>Species was added to the threatened fauna list under the EPBC on 31 March 2023 as the population has declined by an estimated 30–50% over the last ten years (DCCEEW 2023e).</p> <p>Diamond firetails occur on the south-east mainland of Australia from south-east Queensland to Eyre Peninsula, South Australia, and about 300 km inland from the sea (Higgins et al. 2007, cited in DCCEEW 2023e).</p> <p>Diamond firetails occur in Eucalypt, Acacia or Casuarina woodlands, open forests and other lightly timbered habitats, including farmland and grassland with scattered trees (Higgins et al. 2007). They prefer areas with relatively low tree density, few large logs, and little litter cover but high grass cover (DCCEEW 2023e).</p> <p>No previous records within 5 km of project area.</p> <p>Nearest records in the Flinders Ranges and 65km away on EP. Although some habitat may be suitable it is deemed unlikely the species would occur.</p>
<i>Sternula nereis</i>	VU	E	Unlikely	<p>PMST highlighted known to occur in HJP Project Area.</p>

Species ⁴	EPBC rating ¹	NPW Rating ²	Likelihood of Occurrence	Justification ³
Australian Fairy Tern				<p>Occurs along coasts and estuaries, and breeds on sandy beaches or pits (Simpson & Day 2019). Along the coast, this sub-species generally nests on sandy beaches and banks above the high tide line and below vegetation. Will roost on jetty structures.</p> <p>The sub-species' distribution extends along the coasts of South Australia, Tasmania, and central Western Australia (ALA 2023).</p> <p>Three Birdlife records (2006-2011) within 5 km of the HJP Project Area one BDBSA record (2019). Whyalla salt pans and boat ramp.</p> <p>No suitable habitat within or directly adjacent the project area.</p>
<i>Thinornis cucullatus</i> Eastern Hooded Plover, Eastern Hooded Plover	VU	V	Unlikely	<p>PMST highlighted as known to occur in the HJP Study Area.</p> <p>This sub-species mainly occurs on wide beaches backed by dunes, in creeks or inlet entrances. The sub-species is known to occur on many South Australian beaches, including some with human activity presence.</p> <p>No previous records within 5 km of the project area. No suitable habitat within or directly adjacent the project area.</p>
Mammals				
<i>Sminthopsis psammophila</i> Sandhill Dunnart	E	V	Unlikely	<p>PMST highlighted likely to occur in the HJP Project Area.</p> <p>Occurs in spinifex hummock (<i>Triodia</i> species) grasslands between 8 to 20 years post fire (Churchill 2001). Given the history of vegetation clearance, habitat on Eyre Peninsula is likely to be more limited.</p> <p>Distribution is restricted predominantly to the Great Victoria Desert and Eyre Peninsula (Churchill 2001).</p> <p>No previous records within 5 km of the project area. There is no suitable habitat within or adjacent to the project area.</p>
Reptiles				
<i>Aprasia pseudopulchella</i> Flinders Ranges Worm-lizard	VU	-	Unlikely	<p>PMST suggests may occur in the HJP Study Area.</p> <p>Project area occurs outside of the known / suggested distribution of the species (DCCEE 2023b).</p> <p>The Flinders Ranges Worm-lizard burrows freely in loose sand and soil, under rocks and litter (EBS 2008, cited in DCCEE 2023b). The species occurs in open woodland, native tussock grassland, riparian habitats and rocky isolates (Cogger et al. 1993).</p> <p>No previous records within 5 km of the project area.</p> <p>Given there is no preferred habitat in the project area and the project area occurs outside of the known range for this species, it is considered unlikely to occur.</p>

¹EPBC Act status: Migratory Wetland (MW); Endangered (E); Critically Endangered (CE); Vulnerable (VU). Migratory species that are threatened are discussed under this section and not repeated under Migratory species.

²South Australian National Parks and Wildlife Act 1972 status: Endangered (E); Vulnerable (V); Rare (R).

Species ⁴	EPBC rating ¹	NPW Rating ²	Likelihood of Occurrence	Justification ³
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Records from Biological Databases of SA. Recordset number: 2209211, only recent (since 1995) and reliable (< 1km) records included. Record distances presented are approximate, based on the project alignment provided in February 2023.

³All records are based on a 5km study area

⁴Threatened Marine species excluded from likelihood assessment include

- 11 birds including two Endangered species Southern Giant Petrel (*Macronectes giganteus*) and Shy Albatross (*Thalassarche cauta*); and nine Vulnerable species: Antipodean Albatross (*Diomedea antipodensis*), Southern Royal Albatross (*Diomedea epomophora*), Wandering Albatross (*Diomedea exulans*), Sooty Albatross (*Phoebastria fusca*), Indian Yellow-nosed Albatross (*Thalassarche carteri*), Campbell Albatross (*Thalassarche impavida*), Black-browed Albatross (*Thalassarche melanophris*), White-capped Albatross (*Thalassarche steadi*), and Northern Giant Petrel (*Macronectes halli*);
- Two Endangered mammals Australian Sea Lion (*Neophoca cinerea*) and Southern Right Whale (*Eubalaena australis*);
- Three reptiles including two Endangered species Loggerhead Turtle (*Caretta caretta*) and Leatherback Turtle (*Dermochelys coriacea*) and one Vulnerable species Green Turtle (*Chelonia mydas*);
- Two fishes Southern Bluefin Tuna (*Thunnus maccoyii*) and Blue Warehou (*Seriotelella brama*); and
- One Vulnerable Shark Great White Shark (*Carcharodon carcharias*).

4.2.4 Migratory fauna

The PMST highlighted 45 migratory species as potentially utilising the HJP Project Area, of these 23 are oceanic or marine species that are excluded and not considered further (13 Albatross, Shearwater or Petrels, four Whales, one Dolphin, three turtles and two sharks). A further six species were discussed under Threatened Fauna above. The remaining 16 migratory birds were considered further by a likelihood assessment. There are previous recent reliable records within 5 km of the HJP Project Area for seven of these 16 migratory species.

Based on the outcomes of the likelihood assessment it is considered that no migratory species are known or likely to occur. One species, Fork-tailed swift (*Apus pacificus*) is considered possible as a flyover and was recorded 3.8km from the HJP Project Area in 1996. Although there are previous records within 5 km of the project area for some of the coastal / wetland / shorebirds, these records occur in nearby specific habitat such as beach areas, salt pans or wetlands. There is no suitable habitat for these species in, or directly adjacent the HJP Project Area and they are therefore considered unlikely to occur. However, if there are large standing areas of water following heavy rainfall events, presence of some of these species would need to be reconsidered.

The EPBC PMST output and BDBSA data results, along with the likelihood assessment are included in Table 4-5.

Table 4-5. Likelihood of occurrence of protected migratory fauna highlighted by the PMST as potentially occurring in the project or study area

Species ⁴	Migratory Category ¹	NPW Rating ²	Likelihood of Occurrence	Justification ³
Birds				
<i>Actitis hypoleucos</i> Common Sandpiper	MW	R	Unlikely	<p>PMST highlighted as known in the HJP Project Area.</p> <p>This migratory shorebird occurs in a variety of habitats, including a wide range of coastal and inland wetlands with varying levels of salinity. It is mostly found around muddy margins or rocky shores and rarely on intertidal mudflats. The species also occurs on steep sided sewage ponds, dams, muddy habitats, the shallow edges of inland farm dams, and mangrove-lined inlets.</p> <p>This species has a widespread distribution across Australia, in late July to March (Simpson and Day 2019, ALA 2023).</p> <p>BDBSA: Four records (2016-2019), plus one historical record (1981) in Whyalla Wetlands, nearby beach and Salt pans.</p>

Species ⁴	Migratory Category ¹	NPW Rating ²	Likelihood of Occurrence	Justification ³
				<p>Birdlife: 13 records (2000-2020) within 5 km of the project area in the Whyalla wetlands south of Whyalla.</p> <p>No suitable habitat within or directly adjacent the HJP Project Area.</p>
<i>Apus pacificus</i> Fork-tailed Swift	MM	-	Possible as overfly species	<p>PMST highlighted as likely in the HJP Project Area.</p> <p>This species is highly mobile, almost entirely aerial, and rarely recorded on the ground.</p> <p>The species has a widespread distribution across Australia, in summer (ALA 2023).</p> <p>BDBSA: two BDBSA records (1996, 2018), one at Whyalla wetland, the other 3.4 km west of the northern part of the Transmission Line Envelope.</p> <p>Birdlife: Four records (2010-2018) within 5 km of the project area in the Whyalla Wetlands and nearby coastal areas.</p>
<i>Arenaria interpres</i> Ruddy Turnstone	MW	R ssp. <i>interpres</i>	Unlikely	<p>PMST highlighted as known in the HJP Study Area.</p> <p>Breeds in Siberia and Alaska. When in Australia prefers rocky coastlines, coral and sand islands, less common on intertidal mudflats (Geering et al. 2008).</p> <p>Range includes coastline of Australia except Great Australian Bight (Davies et al. 2022).</p> <p>No previous records within 5 km of the project area since 1995 (one historical 1981). No suitable habitat within or directly adjacent the HJP Project Area.</p>
<i>Calidris acuminata</i> Sharp-tailed Sandpiper	MW	-	Unlikely	<p>PMST highlighted as known in the HJP Project Area.</p> <p>Migratory shorebird occurs in coastal and inland areas but prefers non-tidal fresh or brackish wetlands, damp grasslands, will also utilise dams. Coastal populations will use tidal flats (Geering et al. 2008, Simpson & Day 2019, Mehkhorst et al. 2017).</p> <p>Breeds in Siberia, migrates to New Guinea and Australia (summer). This species has a widespread distribution across Australia when present (ALA 2023).</p> <p>BDBSA: Five records (2000-2019) plus historical records (1980's). Whyalla Wetlands, Saltpans, Pistol Club.</p> <p>Birdlife: 15 records (2005-2019) within 5 km of project area in Whyalla Wetlands, beach and coastal areas.</p> <p>No suitable habitat within or directly adjacent the HJP Project Area.</p>
<i>Calidris alba</i> Sanderling	MW	R ssp. <i>alba</i>	Unlikely	<p>PMST highlighted as likely in project the HJP Study Area.</p> <p>This migrant from the high Arctic usually prefers ocean beaches and occasionally intertidal mudflats.</p> <p>No previous records within 5 km of the project area. No suitable habitat within or directly adjacent the HJP Project Area.</p>

Species ⁴	Migratory Category ¹	NPW Rating ²	Likelihood of Occurrence	Justification ³
<i>Calidris melanotos</i> Pectoral Sandpiper	MW	R	Unlikely	<p>PMST highlighted as known in the HJP Project Area.</p> <p>This migratory shorebird occurs in freshwater or brackish wetlands, grassy or lightly vegetated coastal and inland swamps (Geering et al. 2008).</p> <p>Is widespread across southeast Australia (ALA 2023). Usually occurs solitarily or in small flocks, range does not include inland South Australia (Geering et al. 2008; Menkhorst et al. 2017).</p> <p>No previous records within 5 km of the HJP Project Area. No suitable habitat.</p>
<i>Calidris ruficollis</i> Red-necked Stint	MW	-	Unlikely	<p>PMST highlighted as known in the HJP Study Area.</p> <p>Migrant from arctic tundra, in Aus August to Nov.</p> <p>Primarily occurs on tidal flats, but also uses open beaches (with wrack); will occur in a range of sparsely vegetated brackish and freshwater inland with muddy / sandy areas for foraging.</p> <p>BDBSA: Three recent records (2000 - 2019) in Whyalla Salt pans, plus historical records (1980's).</p> <p>Birdlife: Ten records (1999-2014) within 5 km of project area at Whyalla foreshore/beach, wetlands.</p> <p>No suitable habitat within or directly adjacent the HJP Project Area.</p>
<i>Charadrius veredus</i> Oriental Plover, Oriental Dotterel	MW	-	Unlikely	<p>PMST highlighted may occur in the HJP Project Area.</p> <p>This species occurs in both coastal habitats (e.g. estuarine mudflats and sandbanks, sandy or rocky ocean beaches or nearby reefs, or in near-coastal grasslands) and flat, open, semi-arid or arid grasslands (DCCEEW 2023b).</p> <p>Has a widespread distribution throughout Australia (ALA 2023).</p> <p>No previous records within 5 km of the project area. No suitable habitat within or directly adjacent the HJP Project Area.</p>
<i>Gallinago hardwickii</i> Latham's Snipe, Japanese Snipe	MW	R	Unlikely	<p>PMST highlighted may occur in the HJP Project Area.</p> <p>Prefers tussock grass and low dense sedges surrounding freshwater wetland, permanent and ephemeral wetlands. Can also occur in habitats with saline or brackish water.</p> <p>The species has a widespread distribution throughout eastern Australia (ALA 2023). Study area is outside known core range in Australia, in SA range includes South East, not EP (Menkhorst et al. 2017).</p> <p>No previous records within 5 km of the HJP Project Area.</p>
<i>Gallinago stenura</i>	MW	-	Unlikely	<p>PMST highlighted as known in the HJP Study Area.</p> <p>Uncommon, elusive migratory species, that does not breed in Australia (Geering et al. 2008).</p>

Species ⁴	Migratory Category ¹	NPW Rating ²	Likelihood of Occurrence	Justification ³
Pin-tailed Snipe				<p>Occur in freshwater wetlands of coastal plains of northern Western Australia and Northern Territory (Menkhorst et al. 2017, Davies et al. 2022). Study area is outside of known range.</p> <p>No previous records within 5 km of the HJP Project Area.</p>
<i>Limosa lapponica</i> (Bar-tailed Godwit)	MW		Unlikely	<p>PMST highlighted as known to occur in the HJP Project Area.</p> <p>BDBSA: One historical record in the Whyalla salt pans.</p> <p>Birdlife: One record (2004) in the Whyalla wetlands.</p>
<i>Motacilla cinerea</i> Grey Wagtail	MT	-	Unlikely	<p>PMST highlighted may occur in the HJP Project Area.</p> <p>This uncommon migratory wagtail (DOE 2015) favours fast-flowing streams and rivers often in forested areas, in addition to lowland watercourses (BOTW 2023). Occasionally occurs in waterfalls, fast flowing rocky waterways of Nth Australia (Kimberly, WA, Top End, NT, Wet Tropics).</p> <p>Known range is considered to be northern coastal Australia (Davies et al. 2022).</p> <p>No previous records within 5 km of the HJP Project Area.</p>
<i>Motacilla flava</i> Yellow Wagtail	MT	-	Unlikely	<p>PMST highlighted may occur in the HJP Project Area.</p> <p>Has undergone taxonomic revision, this race is now <i>M. tschutschensis</i>. Uncommon migratory wagtail. Occurs in a variety of damp or wet habitats including marshes and bogs. Forages in damp grassland or on bare ground at the edge of rivers, lakes and other wetlands (BOTW 2023).</p> <p>This species has a widespread distribution around the coast of Australia, in spring and summer (Pizzey and Knight 2012, ALA 2023).</p> <p>No previous records within 5 km of the HJP Project Area.</p>
<i>Pandion haliaetus</i> Osprey	MW	E ssp. <i>cristatus</i>	Unlikely	<p>PMST highlighted as known in the HJP Study Area.</p> <p>Coastal Raptor, feeds on fish. Breeding along coastal South Australia, occurs in small and fragmented locations, including Kangaroo Island (Dennis 2007a). Occur on the west coast and southern tip of Eyre Peninsula.</p> <p>BDBSA: One record (2016) Whyalla Pistol Club.</p> <p>Birdlife: one record south-east of Whyalla near the beach (2005)</p> <p>No suitable habitat within the HJP Project Area</p>
<i>Philomachus pugnax</i> Ruff (Reeve)	MW	-	Unlikely	<p>PMST highlighted as known in the HJP Study Area.</p> <p>Migrants occur in variety of open moist habitats, grasslands and agricultural lands but freshwater wetland habitats are preferred in Australia (Menkhorst et al. 2017).</p> <p>Known range includes Eastern NSW through Vic, Lower SE SA to Yorke Peninsula, excludes EP and inland SA (Davies et al 2022).</p>

Species ⁴	Migratory Category ¹	NPW Rating ²	Likelihood of Occurrence	Justification ³
				No previous records within 5 km of the HJP Project Area.
<i>Tringa nebularia</i> Common Greenshank, Greenshank	MW	-	Unlikely	<p>PMST highlighted as known in the HJP Project Area.</p> <p>Migratory shorebird, occurs in intertidal mudflats, fresh and saltwater wetlands along the coast or inland (Geering et al. 2008). Also occupies artificial habitats.</p> <p>Has a widespread distribution throughout Australia, in summer (Geering et al. 2008, ALA 2023). In Australia from Aug to Oct / Nov (Menkhorst 2017), does not breed in Aus.</p> <p>BDBSA: five records (2000-2019) within 5 km of project area at Whyalla Wetlands, Saltpans and Shoreline.</p> <p>Birdlife: 33 records (1998-2020) within 5 km of project area at Whyalla wetlands, beach, foreshore, old rubbish dump and throughout the township.</p> <p>No suitable habitat within or directly adjacent the HJP Project Area.</p>
<i>Tringa stagnatilis</i> Marsh Sandpiper, Little Greenshank	MW	-	Unlikely	<p>PMST highlighted as known in the HJP Study Area.</p> <p>Migrant, breeds in N Hemisphere, Arrives in Australia Sep / Nov (Menkhorst et al. 2007). Range includes Eastern and northern half of, Australia, only coastal areas of study area (Menkhorst et al. 2017, Davies et al. 2022).</p> <p>Prefer shallow fresh or brackish inland wetlands, rivers, water meadows, sewage farms, drains, lagoons and swamps. Also on tidal flats when arrives (mehkhorst et al 2017).</p> <p>Birdlife: two records (2005, 2017) at Whyalla wetlands and beach.</p> <p>BDBSA: One record (2000) Whyalla Saltpan</p> <p>No suitable habitat in the HJP Project Area.</p>

¹EPBC Act status: Migratory Wetland (MW); Migratory Marine (MM); Migratory Terrestrial (MT).

²South Australian National Parks and Wildlife Act 1972 status: Endangered (E); Vulnerable (V); Rare (R).

Records from Biological Databases of SA. Recordset number: 2209211, only recent (since 1995) and reliable (< 1 km) records included. Record distances presented are approximate, based on the project alignment provided in February 2023.

³All records are based on a 5 km study area

⁴Migratory species that are threatened under the EPBC Act are not included in this table but are include under threatened species.

Migratory species excluded from likelihood assessment include:

- Birds: Fleshy-footed Shearwater (*Ardenna carneipes*), Sooty Shearwater (*Ardenna grisea*), Antipodean Albatross (*Diomedea antipodensis*), Southern Royal Albatross (*Diomedea epomophora*), Wandering Albatross (*Diomedea exulans*), Sooty Albatross (*Phoebastria fusca*), Indian Yellow-nosed Albatross (*Thalassarche carteri*), Shy Albatross (*Thalassarche cauta*), Campbell Albatross (*Thalassarche impavida*), Black-browed Albatross (*Thalassarche melanophris*), White-capped Albatross (*Thalassarche steadi*), Southern Giant Petrel (*Macronectes giganteus*) and Northern Giant Petrel (*Macronectes halli*).
- Mammals: Humpback Whale (*Megaptera novaeangliae*), Pygmy Right Whale (*Caperea marginata*), Dusky Dolphin (*Lagenorhynchus obscurus*) and Bryde's Whale (*Balaenoptera edeni*).
- Sharks: Mackerel Shark (*Lamna nasus*)

4.3 State Threatened Species

4.3.1 State Listed Flora

Five threatened flora species have been recorded within 5 km, including three since 1995 and two historically (*Acacia rhigiophylla* (Dagger-leaf Wattle, R) in 1983 and *Austrostip plumigera* (Spear-Grass, R) in 1952). The three species recorded since 1995 include *Acacia pendula* (Weeping Myall, V), *Orobancha cernua* var. *australiana* (Australian Broomrape, R) and *Santalum spicatum* (Sandalwood, V) (Table 4-6). None of these species were observed within the HJP Project Area during the surveys. *Santalum spicatum* could potentially occur but it was not observed during the survey. *A. pendula* is a widely planted species therefore the record may represent a planted specimen.

Table 4-6. State threatened flora species previously recorded within 5 km of the HJP Project Area

Species	Common Name	NPW Rating ¹	Previous Records ²
<i>Acacia pendula</i>	Weeping Myall	V	1 (2018) Whyalla Super School Project. Frequently planted species.
<i>Acacia rhigiophylla</i>	Dagger-leaf Wattle	R	No recent records. One historical record from 1983.
<i>Austrostipa plumigera</i>		R	Historical records only (1952)
<i>Orobancha cernua</i> var. <i>australiana</i>	Australian Broomrape	R	Five records 1995-2016, Whyalla Foreshore
<i>Santalum spicatum</i>	Sandalwood	V	Two records (1998, 2020) Whyalla CP

¹South Australian National Parks and Wildlife Act 1972 status: Rare (R), Vulnerable (V).

Records from Biological Databases of SA. Recordset number: 2209211, only recent (since 1995) and reliable (< 1 km) records included.

Record distances presented are approximate, based on the project alignment provided in February 2023

²Records are based on the 5 km HJP Study Area

4.3.2 State Listed Fauna

There are previous records within 5 km of the HJP Project Area for 28 bird species listed under the NPW Act (Table 4-7), excluding those considered threatened or Migratory under the EPBC Act which are discussed in previous sections.

Most records are within Whyalla saltpans, wetlands and foreshore/beach. However, there are two BDBSA records for Slender-billed Thornbill (*Acanthiza iredalei*, R) in the HJP Project Area, one in the north-west of the Site 1 Project Area and one in the Transmission Line Envelope.

Other terrestrial birds recorded nearby in the Whyalla CP include Gilberts Whistler (*Pachycephala 46nornate*, R), Restless Flycatcher (*Myiagra inquieta*, R), Little Eagle (*Hieraaetus morphnoides*, V), Elegant Parrot (*Neophema elegans*, R) and Rock Parrot (*Neophema petrophila zietzi*, R). There is also a record for wetland species Wood Sandpiper (*Tringa glareola*, R) just east of the Lincoln Highway opposite the Whyalla CP and a record for Musk Duck (*Biziura lobata menziesi*, R) in the Whyalla CP.

It is considered that all terrestrial birds could potentially occur in the HJP Project Area, but noting a detailed likelihood assessment has not been undertaken.

Table 4-7. State threatened fauna species previously recorded within 5 km of the HJP Project Area

Species	Common Name	NPW Rating ¹	Previous Records ²
<i>Acanthiza iredalei iredalei</i>	Slender-billed Thornbill (western)	R	Six BDBSA (2011-2019, 18 Birdlife (2016-2021) Whyalla CP, Cultana Training Area. One in project area (2011)

Species	Common Name	NPW Rating ¹	Previous Records ²
<i>Actitis hypoleucos</i>	Common Sandpiper	R	Four BDBSA, 13 Birdlife (2016-2019), Whyalla Saltpans and wetlands
<i>Anhinga novaehollandiae</i>	Australasian Darter	R	One Birdlife (2009) Hummock Hill
<i>Ardea intermedia plumifera</i>	Plumed Egret	R	One BDBSA (2001) Whyalla Wetlands
<i>Ardeotis australis</i>	Australian Bustard	V	Two BDBSA (2003-2005) Whyalla Golf Course
<i>Biziura lobata menziesi</i>	Musk Duck	R	Three BDBSA, 15 Birdlife (2000-2019) Whyalla Saltpans and wetlands
<i>Bubulcus ibis coromandus</i>	Eastern Cattle Egret	R	Two BDBSA, one Birdlife (2006-2019)
<i>Calidris pugnax</i>	Ruff	R	Historical only (1978-1981)
<i>Cladorhynchus leucocephalus</i>	Banded Stilt	V	Five BDBSA, six Birdlife (2000-2019) Whyalla Saltpans and wetlands plus historical records (1980's)
<i>Egretta garzetta nigripes</i>	Little Egret	R	Eight BDBSA, 22 Birdlife (2000-2020) Whyalla Saltpans and wetlands
<i>Falco peregrinus macropus</i>	Peregrine Falcon	R	Three BDBSA (2015-2019), Whyalla Saltpans and Pistol Club, one Birdlife (2011)
<i>Haematopus fuliginosus</i>	Sooty Oystercatcher	R	13 BDBSA (1999-2013) Whyalla Foreshore/ beach
<i>Haematopus longirostris</i>	Pied Oystercatcher	R	One recent BDBSA record (2018), five Birdlife (1999-2009) Whyalla Foreshore and boat ramp. Also historical records (1980's)
<i>Haliaeetus leucogaster</i>	White-bellied Sea Eagle	E	One BDBSA record (2018) and three Birdlife records (2000-2018) Whyalla Foreshore and Saltpans
<i>Hieraaetus morphnoides</i>	Little Eagle	V	One Birdlife record 2012 in Whyalla CP
<i>Hylacola cauta</i>	Shy Heathwren	R	One record (2021) Cultana Training Area
<i>Myiagra inquieta</i>	Restless Flycatcher	R	One BDBSA record (2015), 1 Birdlife record (2015) Whyalla CP
<i>Neophema elegans</i>	Elegant parrot	R	One Birdlife (2012)
<i>Neophema petrophila zietzi</i>	Rock Parrot	R	One Birdlife (2011)
<i>Pachycephala inornata</i>	Gilbert's Whistler	R	One BDBSA (2020), one Birdlife (2018) Whyalla CP
<i>Pandion haliaetus cristatus</i>	Eatsren Osprey	E	One BDBSA (2016), one Birdlife (2005)

Species	Common Name	NPW Rating ¹	Previous Records ²
<i>Plegadis falcinellus</i>	Glossy Ibis	R	One BDBSA (2017), one Birdlife (2013) Whyalla Wetlands
<i>Podiceps cristatus australis</i>	Great Crested Grebe	R	One BDBSA, one Birdlife (2016, 2019) Whyalla Salt pans
<i>Spatula rhynchotis</i>	Australasian Shoveler	R	One Birdlife (2006) Whyalla Wetlands
<i>Sterna hirundo longipennis</i>	Common Tern	R	Two Birdlife (2000-2010) Whyalla Salt pans
<i>Stictonetta naevosa</i>	Freckled Duck	V	Four BDBSA (2003-2017), nine Birdlife (2003-2018) Whyalla Wetlands
<i>Tringa glareola</i>	Wood Sandpiper	R	Four Birdlife (2014-2019) Whyalla Wetlands
<i>Zapornia tabuensis</i>	Spotless Crake	R	Three BDBSA (1999-2019), two Birdlife (2006-2014) Whyalla Wetlands and Salt pans

¹South Australian National Parks and Wildlife Act 1972 status: Endangered (E); Vulnerable (V); Rare (R).

Records from Biological Databases of SA. Recordset number: 2209211, only recent (since 1995) and reliable (< 1 km) records included. Record distances presented are approximate, based on the project alignment provided in February 2023.

²Records are based on the 5 km HJP Study Area

4.4 Weeds

There are previous records (since 1995, with < 1 km reliability) within 5 km of the HJP Project Area for ten Declared weed species under the LSA Act, two of which are also WoNS (Table 4-8). Additional information on weeds observed during the surveys is described in Section 5.3 and Table 5-7. Weed database records and field survey opportunistic sightings are indicated on Figure 5-5.

Table 4-8. Weeds of National Significance and Declared Weeds with records within 5 km of the HJP Project Area

Species	Common Name	Declared ¹	WoNS ²	Previous Records	Observed in the HJP Project Area
<i>Cenchrus ciliaris</i>	Buffel Grass	✓		14 (2011-2018)	No
<i>Cenchrus setaceus</i>	Fountain Grass	✓		1 (2014)	No
<i>Diplotaxis tenuifolia</i>	Lincoln Weed	✓		5 (2002-2004)	No
<i>Echium plantagineum</i>	Salvation Jane	✓		19 (2002-2004)	Yes
<i>Euphorbia terracina</i>	False Caper	✓		1 (2002)	No
<i>Gazania linearis</i>	Gazania	✓		2 (2018)	No
<i>Lycium ferosissimum</i>	African Boxthorn	✓	✓	None	Yes
<i>Marrubium vulgare</i>	Horehound	✓		3 (2002-2004)	No
<i>Orbea variegata</i>	Carrion-flower	✓		1 (2004)	Yes

Species	Common Name	Declared ¹	WoNS ²	Previous Records	Observed in the HJP Project Area
<i>Cylindropuntia prolifera</i>		✓	✓	15 (2007-2018)	No
<i>Opuntia stricta</i>	Erect Prickly Pear	✓	✓	1 (2005)	Yes

¹ under the Landscape South Australia Act 2019

² most problematic (invasiveness, impact) weed species in Australia as determined by the Federal Government

Records from Biological Databases of SA. Recordset number: 2209211, only recent (since 1995) and reliable (< 1 km) records included. Record distances presented are approximate, based on the project alignment provided in February 2023

5. Field Survey Results

This section summarises the results of field assessments including vegetation surveys and bird surveys. The field inputs have been used to develop vegetation descriptions (provided below), inform vegetation and habitat mapping, summarise flora and fauna species observed and broadly describe the habitat features of the HJP Project Area.

5.1 Broad Vegetation Communities

Five broad vegetation communities and 22 BAM Sites (vegetation associations) have been mapped across the HJP Project Area, the most prevalent being Low open woodlands of Western Myall over Chenopod shrub understorey and Low open woodlands with Western Myall and Blackoak over Chenopod shrub understorey.

Broad communities in the HJP Project Area are grouped into three Major Vegetation Groups based on major landform and floristic characteristics (Table 5-1).

The broad communities have been aligned with Bushland Condition Monitoring (BCM) benchmark communities (EP region of SA (Milne et al. 2008) to enable assessment under the NV Act using the BAM and calculation of a Unit Biodiversity Score (UBS) for each BAM site (vegetation associations). These figures are currently under preparation and when complete and an impact footprint is known can be used to calculate the required SEB (offset) to offset the clearance associated with the Project.

The major vegetation groups, broad vegetation communities and vegetation associations (BAM Sites) mapped across the HJP Project Area during the field surveys are summarised in Table 5-1 below with detailed broad community descriptions and photos of each BAM Sample Point BAM provided in Table 5-2 to Table 5-6.

The broad community numbers and names are provided on Figure 5-1, whilst the BAM Site number (vegetation association) and BAM description are presented on Figure 5-2, Figure 5-3 and Figure 5-4. These Figures also indicate the location of the one hectare BAM Sample points with at least one, sometimes two quadrats assessed for each BAM Site. It should be noted that the HJP Project was initially assessed with the main NW Project and therefore uses the same vegetation numbering system meaning that numbers are not sequential and there are gaps in the numbering where these communities don't fall within the HJP Project Area.

5.1.1 Site 1 Project Area

Vegetation in the Site 1 Project Area all occurs in the Myall Plains IBRA Sub-region but incorporates two IBRA Associations also bordering the margin of a third IBRA Association, an uncommon junction of three IBRA Associations leading to variable landform, vegetation and habitat quality (Figure 5-1, Figure 5-2, Figure 5-3, Figure 5-4).

The north-east of the Site 1 Project Area occurs in the Tregolana IBRA Association and was found to comprise flat to gently undulating plains with Low open woodlands of Western Myall with a Chenopod shrub understorey (NWS EP 2.1), Low open woodlands with Western Myall and Blackoak over chenopod shrub understorey (NWS EP 2.2) and Chenopod open shrublands +/- emergent trees (NWS EP 3.3).

Vegetation was generally in good condition but more degraded areas were observed near tracks and disturbance areas (BAM 54, BAM 55 and parts of BAM 51), particularly in the north east of the Site 1 Project Area. This area comprised extensive chenopod shrublands dominated by *Maireana sedifolia* (Pearl Bluebush) with only limited areas dominated by *M. pyramidata* (Black Blue-bush) (BAM 22) representing preferred habitat for Western Grasswren. Further west, tree cover increased (BAM 32, BAM 52) with smaller pockets of more heavily wooded areas of higher value scattered throughout.

The Red Rock IBRA Association in the west and south of the site was generally of higher value supporting more extensive woodlands over *Maireana pyramidata* (BAM 22 and BAM 57) and more diverse vegetation communities with understorey dominated by *M. sedifolia* including BAM 56, BAM 58 and BAM 60 on gently undulating plains with calcrete and diverse sclerophyll shrublands in BAM 23 near the tanks.

A historical borrow pit / excavation occurred near infrastructure in the east (crossing both IBRA) and was dominated by sparse *Scaevola spinescens* (Spiny Fanflower). Evidence of rabbit grazing was significant in this area.

Near the Whyalla water tanks, in BAM 23 and BAM 29, highly palatable species such as *Alectryon oleifolius* (Bullock Bush) were bushy and ungrazed, which is rarely seen in arid communities. As such, these areas appeared to provide valuable habitat for EPBC listed species Western Grasswren with large ungrazed bushes and multiple strata of vegetation available for use (birds were observed perching on larger bushes).

The majority of vegetation across the Site 1 Project Area was found to be in good to excellent condition with good cover of vegetation, floristic composition indicative of low grazing pressure and minimal weeds, but with some areas of poor-quality vegetation.

Overall, it was found very high value vegetation in the Site 1 Project Area occurred directly around the Whyalla water tanks and downslope to the north and south, particularly in BAM 29, BAM 57 and some areas of BAM 22. These areas provided high quality preferred (and known) habitat for Western Grasswren and diverse vegetation communities. More degraded or lower value areas with respect to habitat quality and lower tree cover were observed in the north east of the Site 1 Project Area, along the existing pipeline track (BAM 51, BAM 54, BAM 55), in the historical excavation in the east (BAM 59) and in the southern end of the site west of the solar array (BAM 21).

A number of tracks dissect the site and an increase in weed species was observed near tracks and near existing infrastructure such as the existing pipeline, Whyalla water tanks, solar array and the eastern corner of the site. Increased disturbance was also observed in old quarries in the south – indicated as ‘white patches’ on the aerial photo. These areas which contained calcrete supporting low open *Maireana sedifolia* chenopod shrubland with only very sparse tree cover, were considered of lower value for the EPBC listed species Western Grasswren and Southern Whiteface.

5.1.2 Transmission Line Envelope

Vegetation in the Transmission Line Envelope all occurs in the Myall Plains IBRA Sub-region and the Tregolana IBRA Association (Figure 5-1, Figure 5-2, Figure 5-3, Figure 5-4) and is characterised by Open Woodlands of Western Myall over mixed chenopods with patches of Blackoak and occasional more open areas of *Maireana sedifolia* / *M. pyramidata* shrublands. East of the Lincoln Highway an infrastructure corridor including tracks, an existing pipeline and railway run parallel to the highway resulting in increased disturbance and fragmentation and an increased abundance and cover of weeds. This area was difficult to access and required predictive mapping in some areas, particularly away from the Lincoln Highway. This area is no longer being considered for infrastructure placement but has been retained in vegetation maps for reference.

In the north of the Transmission Line Envelope (in the area being considered for the sub-station), vegetation was found to be in good to excellent condition, with BAM 106 representing preferred Western Grasswren habitat and BAM 103, in the centre of the funnel-shaped land parcel, providing slightly lower quality Atypical habitat with lower bushes also lacking tree cover.

West of the Lincoln Highway, in the Whyalla CP, vegetation was in good to excellent condition, ungrazed and with good floristic and structural diversity for its type. This understorey in this area (BAM 81) was dominated by *Maireana sedifolia* with sparse *Rhagodia ulicina* (Spiny goosefoot) and was classified as Atypical habitat for Western Grasswren, although the species is known to occur in that area.

An existing track runs parallel to the Lincoln Highway in the Whyalla CP representing an area of existing disturbance. In the north of the Transmission Line Envelope, on DoD land, the majority of vegetation was dominated by *Maireana sedifolia* shrubland and Blackoak Woodlands both classified as Atypical Western Grasswren habitat. However, a patch of preferred habitat occurred at the far northern end (BAM 61).

Table 5-1. Summary of vegetation communities surveyed in the HJP Project Area. Vegetation described as major group, broad community and detailed vegetation association (BAM Site).

*Major Vegetation Group	Broad Veg Community Number and Description	BAM Ref	Vegetation Association	IBRA Association	Site 1 Project Area	Transmission Line Envelope	Western Grasswren habitat	**Overall value	Area (ha)
Major Group 2 EP Open Woodlands of Western Myall, Blackoak and Sugarwood	NWS EP 2.1 Low open woodlands of Western Myall with a Chenopod shrub understorey (BCM Affinity 9.1)***	BAM 52	<i>Acacia papyrocarpa</i> low woodland over mixed shrubs over <i>Maireana sedifolia</i>	Tregolana	Yes	No	Atypical	Moderate to high	116.943
		BAM 57	<i>Acacia papyrocarpa</i> low woodland over <i>Maireana pyramidata</i>	Tregolana/Red Rock	Yes	No	Preferred	Extremely high	13.379
		BAM 59	<i>Scaevola spinescens</i> low open shrubland with emergent <i>Acacia papyrocarpa</i> / <i>Myoporum platycarpum</i> on borrow pit (degraded)	Tregolana/Red Rock	Yes	No	Atypical	Low	16.867
		BAM 60	<i>Acacia papyrocarpa</i> / <i>Myoporum platycarpum</i> low woodland over <i>Atriplex vesicaria</i> and mixed shrubs	Tregolana	Yes	No	Atypical	High	11.302
		BAM 61	<i>Acacia papyrocarpa</i> low woodland over <i>Maireana pyramidata</i> / <i>Atriplex vesicaria</i>	Tregolana	No	Yes	Preferred	Very high	39.602
		BAM 62	<i>Acacia papyrocarpa</i> low very open woodland over <i>Maireana sedifolia</i> / <i>Atriplex vesicaria</i> +/- <i>Maireana pyramidata</i>	Tregolana	No	Yes	Atypical	High	145.558
		BAM 81	<i>Acacia papyrocarpa</i> low woodland over <i>Maireana sedifolia</i> +/- <i>Myoporum platycarpum</i>	Tregolana	No	Yes	Atypical	High	64.910
	NWS EP 2.2 Low open woodlands with Western Myall and Blackoak over Chenopod	BAM 7	<i>Acacia papyrocarpa</i> / <i>Casuarina pauper</i> low open woodland over chenopods (<i>Maireana sedifolia</i> / <i>Maireana pyramidata</i> / <i>Atriplex vesicaria</i>) +/- <i>Myoporum platycarpum</i>	Tregolana	No	Yes	Atypical with areas of preferred	High	108.336
		BAM 32	<i>Acacia papyrocarpa</i> low woodland over chenopods with tall mixed shrubs / <i>Myoporum platycarpum</i> / <i>Casuarina pauper</i>	Tregolana	Yes	Yes	Atypical with areas of preferred	High	79.482

*Major Vegetation Group	Broad Veg Community Number and Description	BAM Ref	Vegetation Association	IBRA Association	Site 1 Project Area	Transmission Line Envelope	Western Grasswren habitat	**Overall value	Area (ha)
	shrub understorey (BCM Affinity 9.1)	BAM 106	<i>Acacia papyrocarpa</i> low woodland over <i>Maireana pyramidata</i> / <i>Atriplex vesicaria</i> +/- <i>Casuarina pauper</i>	Tregolana	No	Yes (sub-station)	Preferred	Very High	26.524
	NWS EP 2.3 Low open woodlands of Sugarwood with a Chenopod shrub understorey (BCM Affinity 9.1)	BAM 29	<i>Myoporum platycarpum</i> low very open woodland over <i>Maireana pyramidata</i>	Red Rock	Yes	No	Preferred	Very high	6.401
		BAM 44	<i>Myoporum platycarpum</i> low very open woodland over <i>dense shrubs on stony hill</i>	Red Rock	Yes	No	Low suitable	High	2.208
Major Group EP 3 Chenopod Shrublands (including drainage lines)	NWS EP 3.3	BAM 20	<i>Maireana pyramidata</i> low shrubland over <i>Austrostipa</i> sp. +/- <i>Atriplex vesicaria</i>	Red Rock	Just South	No	Atypical	Moderate	0 (outside Project Area)
	Chenopod open shrublands +/- emergent trees (BCM Affinity 9.2)	BAM 21	<i>Maireana sedifolia</i> low open shrubland on calcrete +/- emergent low shrubs / <i>Myoporum platycarpum</i> / <i>Acacia papyrocarpa</i>	Red Rock	Yes	No	Low suitable to Atypical	Low to moderate	45.896
		BAM 22	<i>Acacia papyrocarpa</i> low very open woodland over <i>Maireana pyramidata</i> / <i>Maireana sedifolia</i> / <i>Atriplex vesicaria</i>	Tregolana	Yes	No	Preferred	Very high	132.731

*Major Vegetation Group	Broad Veg Community Number and Description	BAM Ref	Vegetation Association	IBRA Association	Site 1 Project Area	Transmission Line Envelope	Western Grasswren habitat	**Overall value	Area (ha)
		BAM 51	<i>Maireana sedifolia</i> open shrubland +/- isolated <i>Acacia papyrocarpa</i>	Red Rock / Tregolana	Yes	Yes	Atypical	Moderate	169.973
		BAM 53	<i>Maireana sedifolia</i> low shrubland with clusters of <i>Acacia papyrocarpa</i>	Red Rock / Tregolana	Yes	No	Atypical	Moderate	56.986
		BAM 54	<i>Maireana sedifolia</i> / <i>Atriplex vesicaria</i> low open shrubland	Tregolana	Yes	No	Atypical	Low	5.455
		BAM 55	<i>Maireana pyramidata</i> / <i>Atriplex vesicaria</i> open shrubland +/- <i>Maireana sedifolia</i>	Tregolana	Yes	No	Atypical	Low	1.774
		BAM 56	<i>Maireana sedifolia</i> / <i>Atriplex vesicaria</i> shrubland +/- emergent <i>Acacia papyrocarpa</i>	Red Rock	Yes	No	Atypical	Moderate	3.875
		BAM 58	<i>Maireana pyramidata</i> / <i>Sida petrophila</i> shrubland with emergent <i>Acacia papyrocarpa</i> / <i>Myoporum platycarpum</i>	Red Rock	Yes	No	Atypical	High	10.609
		BAM 103	<i>Maireana pyramidata</i> / <i>Atriplex vesicaria</i> open shrubland +/- <i>Maireana sedifolia</i>	Tregolana	No	Yes	Atypical	Moderate	12.945
Major Vegetation Group EP 5 Inland tall shrublands on calcrete	NWS EP 5.1 Inland tall shrublands on calcrete	BAM 23	<i>Melaleuca lanceolata</i> tall shrubland over <i>Tridodia</i> sp +/- <i>Maireana pyramidata</i> / <i>Maireana sedifolia</i> / <i>Atriplex vesicaria</i>	Red Rock	Yes	No	Atypical	High	18.563

*Major Vegetation Group	Broad Veg Community Number and Description	BAM Ref	Vegetation Association	IBRA Association	Site 1 Project Area	Transmission Line Envelope	Western Grasswren habitat	**Overall value	Area (ha)
<p>*Only includes vegetation types that occur in the HJP Project Area</p> <p>For reference the current very high level vegetation groupings currently are:</p> <ol style="list-style-type: none"> 1. Open Woodlands of Western Myall, Blackoak and Sugarwood 2. Chenopod Shrublands (including drainage lines) 3. Inland tall shrublands on calcrete <p>**Qualitative value based on habitat value for EPBC listed species (Western Grasswren, Southern Whiteface) and density of tree cover – understorey dominated by <i>Maireana pyramidata</i> provides more valuable habitat value for Western Grasswren, more heavily wooded areas may provide increased habitat value for Southern Whiteface and/or provide increased structural diversity and are expected to take longer to replace (e.g. areas with a high density of <i>Acacia papyrocarpa</i> are considered of higher value compared with areas lacking tree cover except where vegetation provides preferred habitat for Western Grasswren).</p> <p>Qualitative value category descriptions:</p> <p>Extremely high = Preferred habitat of very high quality (with or without tree cover).</p> <p>Very High = Preferred habitat (with or without tree cover)</p> <p>High = Atypical habitat with moderate to high tree cover (e.g. more heavily wooded areas of Atypical habitat). Areas of less than two hectares are not included in this category unless they are adjacent a patch of high value/heavily wooded area. Category also includes unique or very diverse vegetation.</p> <p>Moderate = Atypical habitat without tree cover in moderate to good condition</p> <p>Low = degraded and disturbed vegetation of lower value.</p> <p>(***Milne TI, Croft SJ and Pedler JA (2013) Bushland condition monitoring manual: Eyre Peninsula region. Nature Conservation Society of South Australia, Adelaide</p>									

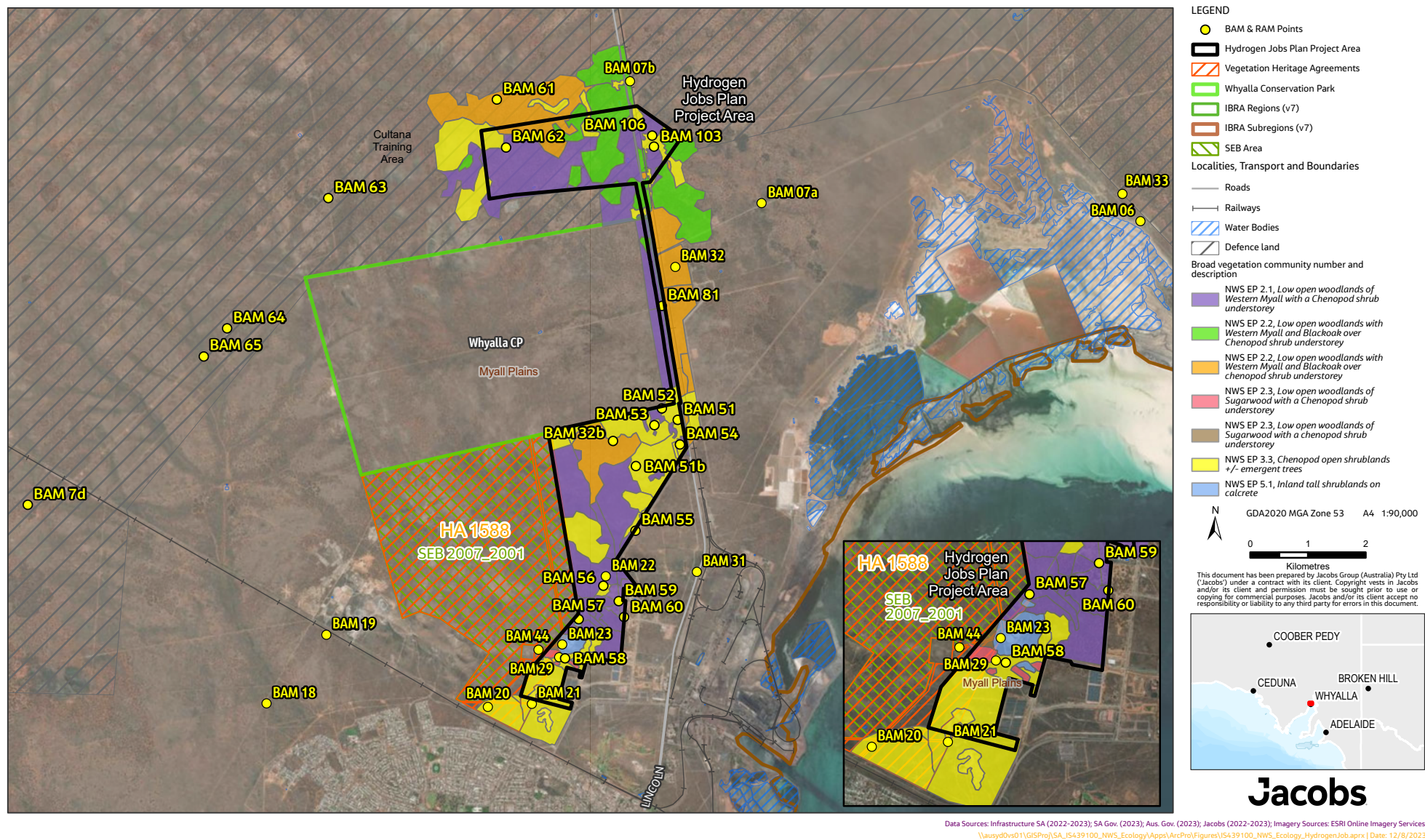


Figure 5-1. Jacobs Broad Vegetation Community mapping (based on field surveys).

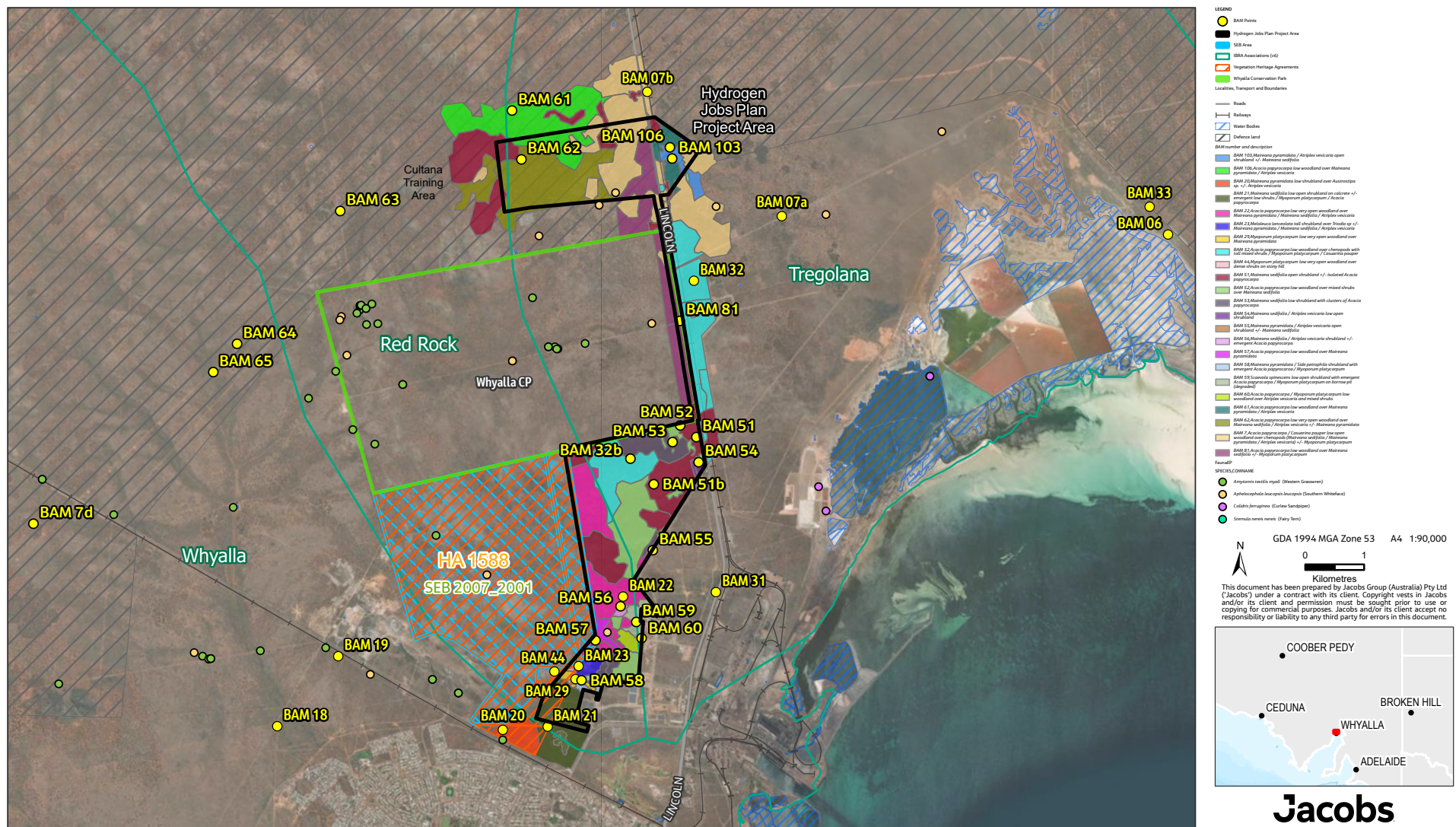


Figure 5-2 Detailed vegetation association (BAM) mapping based on field surveys (Map 1 of 3 (overview Hydrogen Jobs Plan Project Area and surrounds) including IBRA Associations).

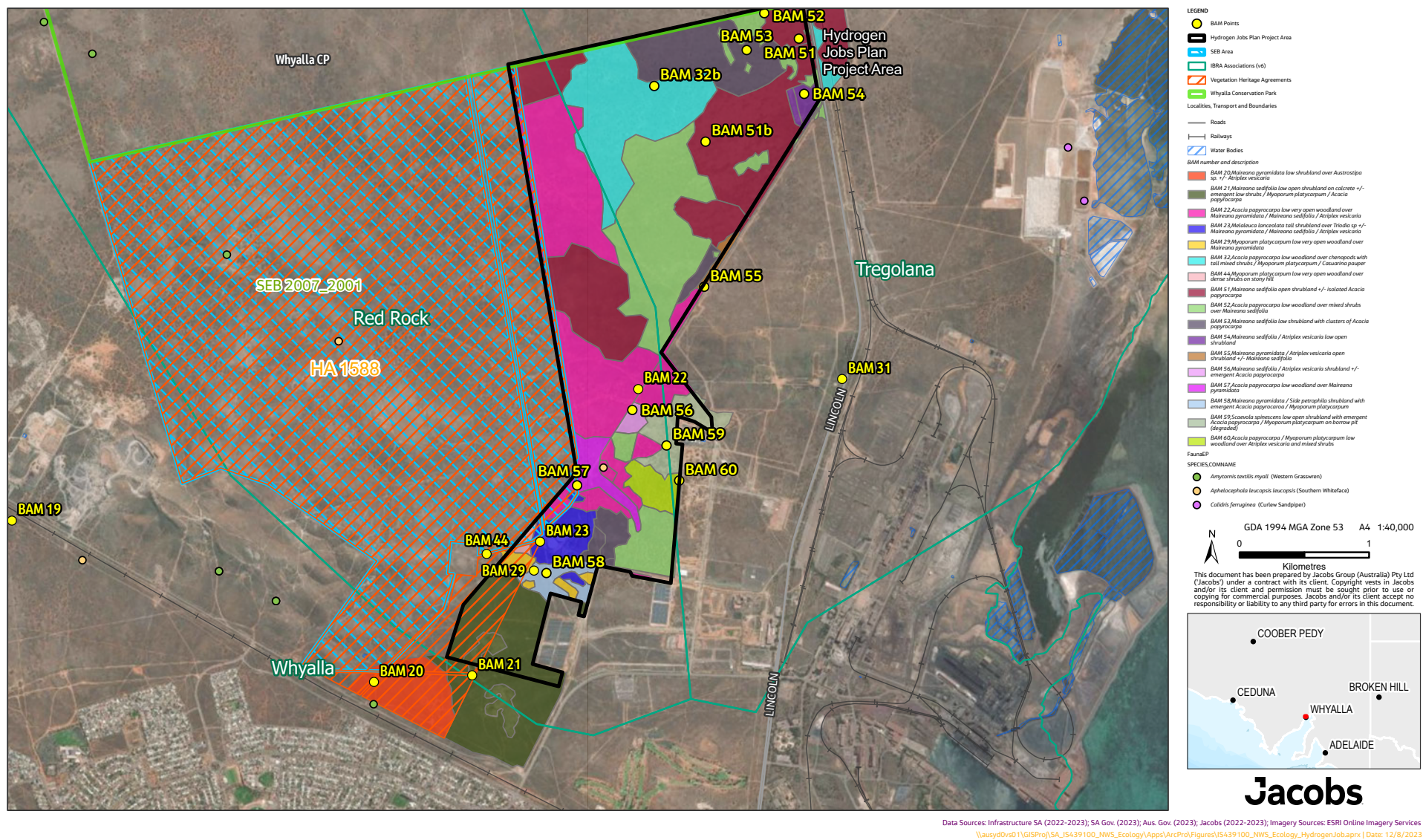


Figure 5-3 Detailed vegetation association (BAM) mapping based on field surveys (Map 2 of 3 Site 1 Project Area and surrounds) including IBRA Associations.

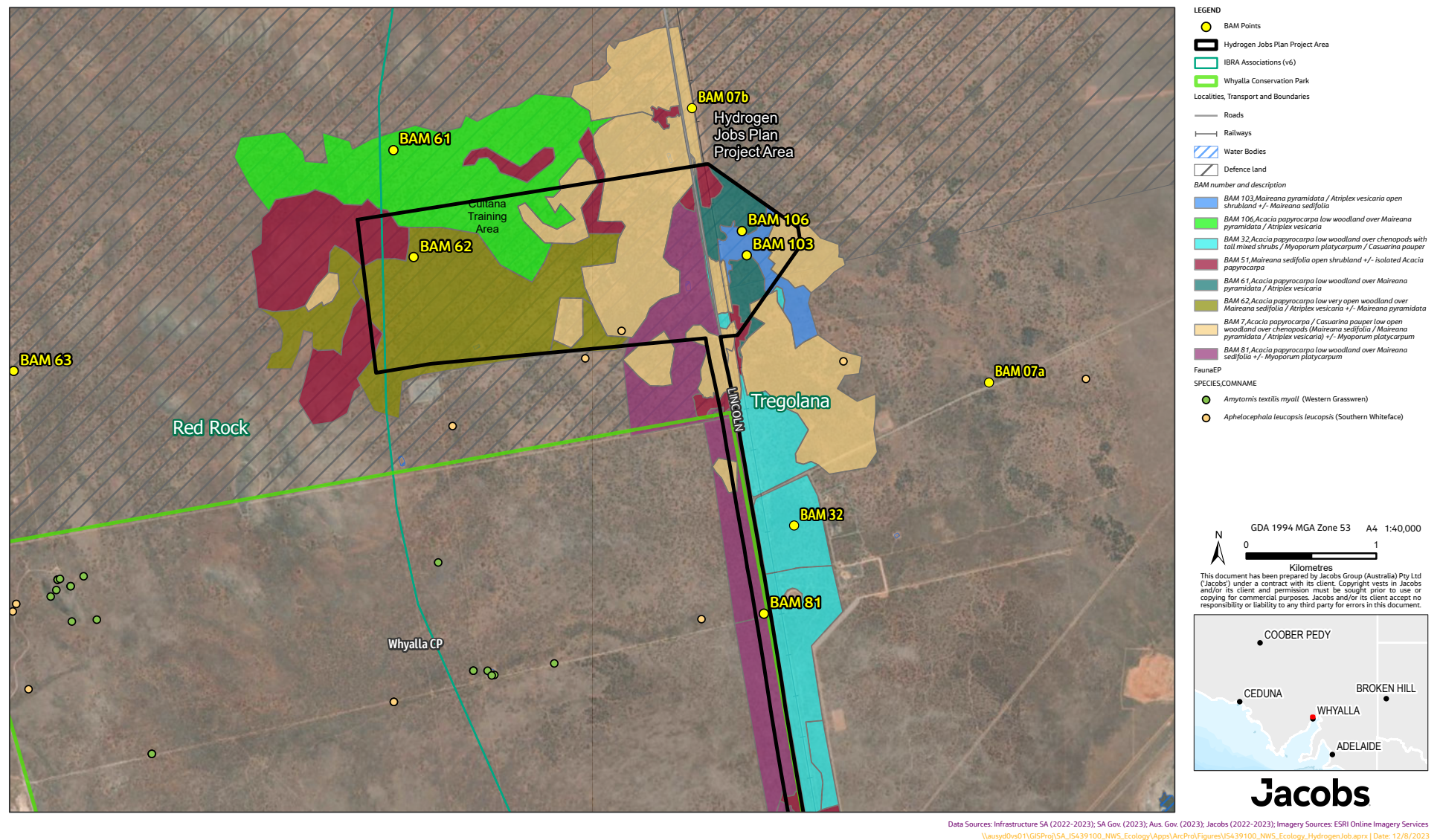


Figure 5-4 Detailed vegetation association (BAM) mapping based on field surveys (Map 3 of 3 Transmission Line Envelope and surrounds) including IBRA Associations.

5.2 Vegetation Descriptions

5.2.1 EP Major Group 2 – Open Woodlands of Western Myall, Blackoak and Sugarwood

Table 5-2. Broad vegetation community NWS EP 2.1 Low open woodlands of Western Myall with a Chenopod shrub understorey

Broad community NWS EP 2.1 Low open woodlands of Western Myall with a Chenopod shrub understorey	
BAM 22	<i>Acacia papyrocarpa</i> low very open woodland over <i>Maireana pyramidata</i> / <i>M. sedifolia</i> / <i>Atriplex vesicaria</i>
BAM 52	<i>Acacia papyrocarpa</i> low woodland over mixed shrubs over <i>Maireana sedifolia</i>
BAM 57	<i>Acacia papyrocarpa</i> low woodland over <i>Maireana pyramidata</i>
BAM 59	<i>Scaevola spinescens</i> low open shrubland with emergent <i>Acacia papyrocarpa</i> / <i>Myoporum platycarpum</i> on borrow pit (degraded)
BAM 60	<i>Acacia papyrocarpa</i> / <i>Myoporum platycarpum</i> low woodland over <i>Atriplex vesicaria</i> and mixed shrubs
BAM 61	<i>Acacia papyrocarpa</i> low woodland over <i>Maireana pyramidata</i> / <i>Atriplex vesicaria</i>
BAM 62	<i>Acacia papyrocarpa</i> low very open woodland over <i>Maireana sedifolia</i> / <i>Atriplex vesicaria</i> +/- <i>Maireana pyramidata</i>
BAM 81	<i>Acacia papyrocarpa</i> low woodland over <i>Maireana sedifolia</i> +/- <i>Myoporum platycarpum</i>
General description	<p>Within the HJP Project Area, this community occurs within the Myall plains Sub-region, across two IBRA Associations (Red Rock and Tregolana) and was assessed at eight BAM sites. Broad community NWS EP 2.1 is the most dominant in the HJP Project Area occurring from the NW corner through the centre and into the southern section of the HJP Project Area.</p> <p>The community comprises flat to gently-undulating plains of <i>Acacia papyrocarpa</i> (Western Myall) open woodland over a chenopod shrubland with dominant species including <i>Maireana pyramidata</i> (Black Bluebush), <i>M. sedifolia</i> (Pearl Bluebush), <i>Atriplex vesicaria</i> (Bladder saltbush) and less often <i>Rhagodia ulicina</i> (Spiny Goosefoot). Other species include <i>Scaevola spinescens</i> (Spiny Fan-flower), <i>Lycium australe</i> (Australian Boxthorn), <i>Lawrencia squamata</i> (Thorny Lawrencia) and emergent tall shrubs <i>Eremophila</i> spp. (Emu-bushes), <i>Geijera linearifolia</i> (Sheepbush) and <i>Senna</i> spp. (Senna's). The community often contains emergent <i>Myoporum platycarpum</i> (False Sandalwood).</p> <p>Condition is variable but overall the community was considered to be in moderate to good condition retaining palatable species and with low to moderate grazing pressure. There are sections of BAM 22 that are considered more disturbed, including in the eastern section of the Site 1 Project Area where there are existing tracks/trails (including walking and potentially motorbike) and where an existing pipeline has been installed.</p> <p>Similar communities containing <i>Casuarina pauper</i> (Blackoak) are separated into broad community EP 2.2 whilst communities comprised of <i>M. platycarpum</i> with no <i>A. papyrocarpa</i> are separated into community EP 2.3. Community has affinity to BCM community 9.1 Open Mallee & Low Open Woodlands with a Chenopod Shrub Understorey.</p>
Threatened species or community and overall value	<p>The community is considered to provide habitat for Nationally threatened Western Grasswren in areas of taller chenopod shrubs, particularly <i>M. pyramidata</i> and areas with spiny shrubs such as <i>S. spinescens</i>, <i>R. spinescens</i> and <i>L. australe</i>. Western Grasswren were heard in this community at Bird Survey site BS 26 near Song Meter site SM07. There is also a record (2011) in this community within the project area for the Nationally Vulnerable Southern Whiteface (BDBSA 2022). State rare Gilberts Whistler was observed in October 2022.</p> <p>Site 1 Project Area</p> <p>In Site 1, Broad Community 2.1 dominated the northern and eastern slopes extending from the Whyalla water tanks through the centre of the Site 1 Project Area, and in small patches scattered through more degraded areas in the northeast of the site. Preferred, good quality Western Grasswren habitat was</p>

observed directly north of the Whyalla water tanks in BAM 22 and an area of particularly high habitat quality was mapped in a drainage line north of the Whyalla water tanks in BAM 57. This community was separated as it appeared to be optimal Western Grasswren habitat with very large *M. pyramidata* and increased cover and structural diversity. BAM 52 (when in larger patches) and BAM 60 were also classified as high value due to their good condition, increased tree cover and high structural and floristic diversity which would take longer to regenerate and may provide increased habitat opportunities for a range of species including EPBC listed Southern Whiteface. BAM 59 was in an old quarry / borrow pit and was of lower quality.

Transmission Line Envelope

In the Transmission Line Envelope broad community 2.1 occurred west of the road in Whyalla CP and on DoD land. Good quality preferred habitat occurred in BAM 61 on DoD land in the far north of the Transmission Line Envelope, west of the Lincoln highway, and east of the Highway in the northern end (with two patches surrounding a treeless patch of lower habitat quality in BAM 103).

BAM 62 and 81 were also considered of high value with good tree cover providing increased habitat opportunities for fauna including EPBC listed Southern Whiteface. BAM 81 occurred in the Whyalla CP and although classified as Atypical Western Grasswren habitat (dominated by *Maireana sedifolia* with occasional low *Rhagodia ulicina*), is in excellent condition being long ungrazed and is known to be utilised by the species.



Plate 5-1. BAM 22 *Acacia papyrocarpa* low open woodland over *Maireana pyramidata* / *M. sedifolia* / *Atriplex vesicaria*, Site 1 Project Area



Plate 5-2. BAM 52 *Acacia papyrocarpa* low woodland over mixed shrubs over *Maireana sedifolia*, Site 1 Project Area



Plate 5-3. BAM 57 *Acacia papyrocarpa* low woodland over *Maireana pyramidata*, Site 1 Project Area



Plate 5-4. BAM 59 *Scaevola spinescens* low open shrubland with emergent *Acacia papyrocarpa* / *Myoporum platycarpum* on borrow pit (degraded), Site 1 Project Area.



Plate 5-5. BAM 60 *Acacia papyrocarpa* / *Myoporum platycarpum* low woodland over *Atriplex vesicaria* and mixed shrubs, Site 1 Project Area.



Plate 5-6 BAM 61a *Acacia papyrocarpa* low woodland over *Maireana pyramidata* / *Atriplex vesicaria*, Transmission Line Envelope.



Plate 5-7 BAM 106 *Acacia papyrocarpa* low woodland over *Maireana pyramidata* / *Atriplex vesicaria*, Transmission Line Envelope



Plate 5-8 BAM 62 *Acacia papyrocarpa* low very open woodland over *Maireana sedifolia* / *Atriplex vesicaria* +/- *Maireana pyramidata*, Transmission Line Envelope



Plate 5-9. BAM 81 *Acacia papyrocarpa* low woodland over *Maireana sedifolia* +/- *Myoporum platycarpum*, Transmission Line Envelope

Table 5-3. Broad vegetation community NWS EP 2.2 Low open woodlands with Western Myall and Blackoak over chenopod shrub understorey

Broad community NWS EP 2.2 Low open woodlands with Western Myall and Blackoak over chenopod shrub understorey	
BAM 7	<i>Acacia papyrocarpa</i> / <i>Casuarina pauper</i> low open woodland over chenopods (<i>Maireana sedifolia</i> / <i>Maireana pyramidata</i> / <i>Atriplex vesicaria</i>) +/- <i>Myoporum platycarpum</i>
BAM 32	<i>Acacia papyrocarpa</i> low woodland over chenopods with tall mixed shrubs / <i>Myoporum platycarpum</i> / <i>Casuarina pauper</i>
BAM 106	<i>Acacia papyrocarpa</i> low woodland over <i>Maireana pyramidata</i> / <i>Atriplex vesicaria</i> +/- <i>Casuarina pauper</i>
General description	<p>Within the HJP Project Area, this community occurs within the Myall Plains Sub-region and occurs almost entirely within the Tregolana IBRA association. It is represented by two BAM sites (associations BAM 7 and BAM 32) much of which were only broadly assessed due to access and time constraints. Broad community 2.1 is the second most abundant community in the HJP Project Area occurring mainly in the northern end of the proposed transmission line. It was most abundant east of the Lincoln Highway outside of the current HJP Project Area, but also occurred in the Transmission Line Envelope in the north on both sides of the highway.</p> <p>Community 2.2 comprises flat to gently undulating plains with open woodlands of both <i>Acacia papyrocarpa</i> and <i>Casuarina pauper</i> (Blackoak) varying in their dominance with or without <i>Myoporum platycarpum</i>. It was found <i>C. pauper</i> increased in frequency of occurrence north of Whyalla including near Whyalla CP and dominated in smaller patches or as scattered individuals. Roadside areas subject to increased run-off, often supported dense regeneration of <i>A. papyrocarpa</i> whilst where the community extended into pastoral land, young specimens were often scarce and hard grazed. The understorey occurring predominantly over chenopod shrublands including <i>Maireana pyramidata</i> (Black Blue-bush), <i>M. sedifolia</i> (Pearl Bluebush), <i>Atriplex vesicaria</i> (Bladder saltbush) and less often <i>Rhagodia ulicina</i>. Tall shrubs were also occasionally present including <i>Eremophila</i> spp. (Emu-bushes), <i>Geijera linearfolia</i> (Sheepbush) and <i>Senna</i> spp. (Sennas), particularly in BAM 32.</p> <p>The community varies in condition but was generally found to be in moderate to good condition retaining palatable species and with low to moderate grazing pressure. Similar communities of <i>A. papyrocarpa</i> without <i>C. pauper</i> are separated into broad community 2.1, whilst communities with <i>M. platycarpum</i> overstorey with no Western Myall or Blackoak are separated into community 2.3. Community 2.2 is considered to have affinity with BCM community 9.1 Open Mallee & Low Open Woodlands with a Chenopod Shrub Understorey.</p>
Threatened species or community and overall value	<p>The community is considered to provide Atypical to Preferred habitat for Western Grasswren, particularly in areas of taller Chenopod shrubs particularly <i>M. pyramidata</i> and areas with spiny shrubs such as <i>S. spinescens</i>, <i>R. spinescens</i> and <i>L. australe</i>. Whilst Western Grasswren were not observed in this community during surveys, the species was observed nearby and is expected to occur. The community is also expected to provide habitat for Southern Whiteface and a range of SA threatened species.</p> <p>Site 1 Project Area</p> <p>One patch (BAM 32) in the north-west of the Site 1 Project Area provides Atypical habitat for Western Grasswren but with smaller isolated patches with <i>Lycium australe</i> providing increased value. This area was floristically diverse with a high cover of trees and is generally considered of high value.</p> <p>Transmission Line Envelope</p> <p>The community occurred predominantly in the north of the Transmission Line Envelope on DoD land and east of the Lincoln Highway outside of the HJP Project Area. The majority has been classified as Atypical Western Grasswren habitat, except for an area east of the Lincoln Highway with understorey dominated by <i>Maireana pyramidata</i> in BAM 32. This community was only broadly assessed due to time constraints and access limitations. However, little of this community falls within the HJP Project Area.</p>



Plate 5-10. BAM 7 *Acacia papyrocarpa* / *Casuarina pauper* low open woodland over chenopods (*Maireana sedifolia* / *M. pyramidata* / *Atriplex vesicaria*) +/- *Myoporum platycarpum*, Transmission Line Envelope



Plate 5-11. BAM 32a *Acacia papyrocarpa* low woodland over chenopods with tall mixed shrubs / *Myoporum platycarpum* / *Casuarina pauper*, east of Transmission Line Envelope, Lincoln Highway



Plate 5-12. BAM 32b *Acacia papyrocarpa* low woodland over chenopods with tall mixed shrubs / *Myoporum platycarpum* / *Casuarina pauper*, north of Site 1 Project Area



Plate 5-13. BAM 106 *Acacia papyrocarpa* low woodland over *Maireana pyramidata* / *Atriplex vesicaria* +/- *Casuarina pauper*
Transmission Line Envelope (east of Lincoln Highway)

Table 5-4. Broad vegetation community NWS EP 2.3 Low open woodlands of Sugarwood with a Chenopod shrub understorey (BAM 29, 44)

Broad community NWS EP 2.3 Low open woodlands of Sugarwood with a Chenopod shrub understorey	
BAM 29	<i>Myoporum platycarpum</i> low very open woodland over <i>Maireana pyramidata</i>
BAM 44	<i>Myoporum platycarpum</i> low very open woodland over dense shrubs on stony hill
General description	<p>Within the HJP Project Area, this community occurs within the Myall Plains Sub-region and entirely within the Red Rock IBRA association. It is represented by two BAM, BAM 29 south of the Whyalla water tanks and BAM 44 west of the Whyalla water tanks and across 8.609 ha and having the most restricted extent of the broad vegetation communities.</p> <p>This broad community occurs on the southern and western slopes near the Whyalla water tanks with an overstorey comprised of <i>Myoporum platycarpum</i> (Sugarwood) without <i>Acacia papyrocarpa</i> (or if present very sparse). The understorey was dominated by <i>Maireana pyramidata</i>, <i>M. sedifolia</i>, <i>Atriplex vesicaria</i>, <i>Rhagodia ulicina</i> and with emergent shrubs (<i>Eremophila</i> spp., <i>Senna</i> spp., <i>Geijera linearifolia</i>). This community was found to be in good condition generally with reasonable diversity and taller chenopod specimens. BAM 44 and 29 extend into the adjacent Heritage Agreement (HA) west of the HJP Project Area. Vegetation was in good condition, floristically diverse with abundant chenopods and taller shrubs.</p> <p>Similar communities with Western Myall without Blackoak are separated into broad community 2.1, whilst communities with Blackoak are classified in community 2.2. The community is considered to align with BCM Community 9.1 – Open Mallee & Low Open Woodlands with a Chenopod Shrub Understorey.</p>
Threatened species or community and overall value	<p>Broad community 2.3 represents important habitat for Western Grasswren which were observed and heard multiple times in this area. Although not strictly optimal habitat, it did appear the increased structural diversity was a factor in the frequency of occurrence for the species. This was also observed west of Whyalla for the NW Project. In addition, large and ungrazed palatable flora was abundant including <i>Maireana pyramidata</i>, <i>Exocarpos aphyllus</i> (Leafless Cherry) and <i>Alectryon oleifolius</i> (Bullock Bush) with foliage to the ground and Western Grasswren observed utilising these species as cover. The community is also expected to provide habitat for Southern Whiteface, Blue-winged Parrott and a range of SA threatened species.</p> <p>Site 1 Project Area</p> <p>All of community 2.3 occurred in the Site 1 Project Area and was in good condition. The area represented by BAM 29 (approx. 6.401 ha) is mapped as Preferred habitat for Western Grasswren. However, within this area the vegetation is considered to be more suitable (preferred) in areas where there is a moderate – dense spiny shrub layer, and less suitable where the vegetation was more open / lower and little or no Blackbush was present (although Western Grasswren were observed in areas with very low chenopod cover but other shrubs with foliage to the ground were present). There were multiple detections (observed and heard) of Western Grasswren within BAM 29 during the survey, near the Whyalla water tanks. BAM 44 (2.208 ha) was considered somewhat less suitable for Western Grasswren and classified as Atypical habitat, but at least three Western Grasswren individuals were heard in this area during the survey regardless.</p> <p>Transmission Line Envelope</p> <p>This community did not occur in the Transmission Line Envelope</p>



Plate 5-14. BAM 29 *Myoporum platycarpum* low very open woodland over *Maireana pyramidata*, Site 1 Project Area. Left BAM 29 Sample point. Right: view of BAM 29 in the distance on southern slopes of the Whyalla water tanks.

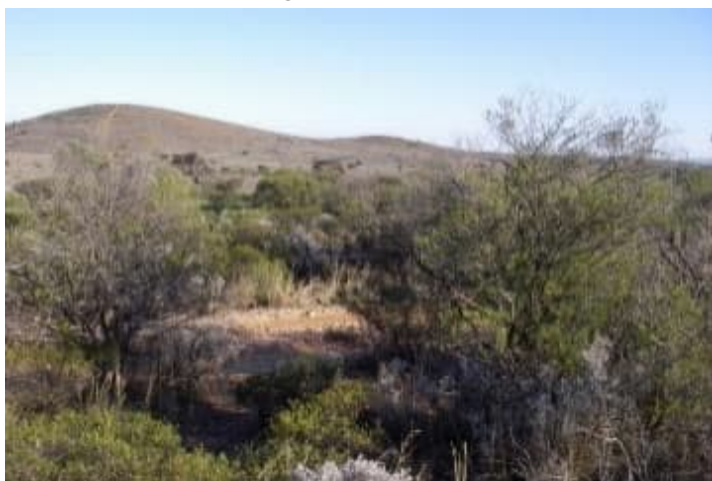


Plate 5-15. Bam 44 *Myoporum platycarpum* low very open woodland over dense shrubs on stony hill, Site 1 Project Area

5.2.2 EP Major Group 3 – Chenopod Shrublands Including Drainage Lines

Table 5-5. Broad vegetation community NWS EP 3.3 Chenopod open shrublands +/- emergent trees

Broad community NWS EP 3.3 Chenopod open shrublands +/- emergent trees	
BAM 21	<i>Maireana sedifolia</i> low open shrubland on calcrete +/- emergent low shrubs / <i>Myoporum platycarpum</i> / <i>Acacia papyrocarpa</i>
BAM 51	<i>Maireana sedifolia</i> open shrubland +/- isolated <i>Acacia papyrocarpa</i>
BAM 53	<i>Maireana sedifolia</i> low shrubland with clusters of <i>Acacia papyrocarpa</i>
BAM 54	<i>Maireana sedifolia</i> / <i>Atriplex vesicaria</i> low open shrubland
BAM 55	<i>Maireana pyramidata</i> / <i>Atriplex vesicaria</i> open shrubland +/- <i>Maireana sedifolia</i>
BAM 56	<i>Maireana sedifolia</i> / <i>Atriplex vesicaria</i> shrubland +/- emergent <i>Acacia papyrocarpa</i>
BAM 58	<i>Maireana pyramidata</i> / <i>Side petrophila</i> shrubland with emergent <i>Acacia papyrocarpa</i> / <i>Myoporum platycarpum</i>
BAM 103	<i>Maireana pyramidata</i> / <i>Atriplex vesicaria</i> open shrubland +/- <i>Maireana sedifolia</i>
General description	<p>Within the HJP Project Area, this community occurs within the Myall Plains Sub-region and in patches between woodlands in across the Red Rock and Tregolana IBRA Associations. It is represented by eight BAM covering total 307.514 ha across the HJP Project Area.</p> <p>This broad community occurs in patches throughout the HJP Project Area in small to large patches between open woodlands. Vast areas of <i>Maireana sedifolia</i> shrubland occurs in the northern half of the Site 1 Project Area. Community NWS EP 3.3 represents Chenopod open shrublands on flat and gently undulating loam and calcareous plains occurring in six areas across the HJP Project Area in the north-east, west and south-west of the Site 1 Project Area. Dominant chenopods are <i>Maireana sedifolia</i>, <i>M. pyramidata</i> which vary in their dominance and often form a mosaic with <i>M. pyramidata</i> dominating in lower lying heavier soils and near water points (given its lower palatability) and <i>M. sedifolia</i> dominating on higher slopes particularly on calcareous rises. <i>Atriplex vesicaria</i> is often co-dominant. The community supports scattered emergent shrubs and trees including <i>Myoporum platycarpum</i>, <i>Geijera linearifolia</i>, <i>Eremophila</i> and <i>Senna</i> in addition to occasional <i>Acacia papyrocarpa</i>, <i>A. tetragonophylla</i> (Dead Finish) and <i>A. oswaldii</i> (Oswald's Wattle). Note, where the community tends to woodland structure it is described under broad community EP 2.1, 2.2 or 2.3 noting that the nature of Western Myall deems it often difficult to describe as a woodland or shrubland. The community is considered to align with BCM Community 9.2.</p>
Threatened species or community and overall value	<p>Broad community 3.3 provides some habitat for Western Grasswren but most birds were seen or heard in open woodlands which were the areas found to contain the most Preferred habitat in the HJP Project Area. In fact, all of community 3.3 was defined as Unsuitable, Low suitable or Atypical Western Grasswren habitat, regardless that it is known the birds occur in some areas. The community is also expected to provide habitat for Southern Whiteface, Blue-winged Parrot and a range of SA threatened species.</p> <p>Site 1 Project Area</p> <p>Predominantly occurred in the far south and far north-east of the Site 1 Project Area. The south was dominated by low open <i>Maireana sedifolia</i> shrubland considered of Atypical habitat for Western Grasswren with old quarries or borrow pits of low suitability. Chenopod shrublands in the northeast of the site were Atypical habitat noting that close to the track are more disturbed areas of lower value.</p> <p>Transmission Line Envelope</p> <p>Patches of Atypical Western Grasswren habitat occurred at the north of the Transmission Line Envelope with a patch of increased <i>Maireana pyramidata</i> and higher value east of the highway. However, even in this location bushes were mostly less than 0.5 m and the site (BAM 103) was classified as Atypical habitat.</p>

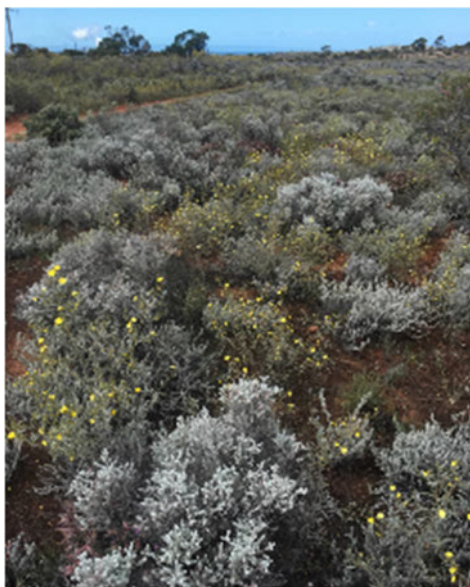


Plate 5-16. BAM 21 *Maireana sedifolia* / *A. vesicaria* low open shrubland with emergent *M. platycarpum*, Site 1 Project Area



Plate 5-17. BAM 51a *Maireana sedifolia* open shrubland +/- isolated *Acacia papyrocarpa*, Site 1 Project Area



Plate 5-18. BAM 51b *Maireana sedifolia* open shrubland +/- isolated *Acacia papyrocarpa*, Site 1 Project Area



Plate 5-19. BAM 53 *Maireana sedifolia* low shrubland with clusters of *Acacia papyrocarpa*, Site 1 Project Area



Plate 5-20. BAM 54 *Maireana sedifolia* / *Atriplex vesicaria* low open shrubland, Site 1 Project Area



Plate 5-21. BAM 55 *Maireana pyramidata* / *Atriplex vesicaria* open shrubland +/- *Maireana sedifolia*, Site 1 Project Area




Plate 5-22. BAM 56 *Maireana sedifolia* / *Atriplex vesicaria* shrubland +/- emergent *Acacia papyrocarpa*, Site 1 Project Area



Plate 5-23. BAM 58 *Maireana pyramidata* / *Sida petrophila* shrubland with emergent *Acacia papyrocarpa* / *Myoporum platycarpum*, Site 1 Project Area

5.2.3 EP Major Group 5 – Inland tall shrublands on calcrete

Table 5-6. Broad vegetation community NWS EP 5.1 Inland tall shrublands on calcrete

Broad community NWS EP 5.1 Inland tall shrublands on calcrete	
BAM 23	<i>Melaleuca lanceolata</i> tall shrubland over <i>Triodia</i> sp +/- <i>Maireana pyramidata</i> / <i>Maireana sedifolia</i> / <i>Atriplex vesicaria</i>
General description	<p>Within the HJP Project Area, this community occurs within the Myall Plains Sub-region and entirely within the Red Rock IBRA association, represented by one BAM 23 around the Whyalla water tanks.</p> <p>This broad community was unique in structure, landform and floristic composition. It occurred on a high rocky calcareous rise near the tanks and was highly diverse with an overstorey of <i>Melaleuca lanceolata</i> (Dryland Tea-tree) over <i>Westringia rigida</i> (Stiff Westringia) and <i>Triodia scariosa</i> (Spinifex) with midstorey layer of <i>Acacia notabilis</i> (notable Wattle), <i>Eremophila alternifolia</i> (Narrow-leaf Emubush), <i>Eremophila longifolia</i> (Weeping Emu-bush) and <i>Exocarpos aphyllus</i>. Chenopods are scattered throughout the rise and increase in abundance downslope tending to preferred Western Grasswren habitat including <i>Myoporum platycarpum</i> and <i>Acacia papyrocarpa</i> Woodlands over Chenopods <i>Maireana pyramidata</i> and <i>M. sedifolia</i> on lower slopes (represented by BAM 29, discussed above).</p> <p>Broad community 5.1 is partially located within Heritage Agreement 1588 and SEB 2007_2001. The area was also noted as being used for community recreation with runners and dog walkers on site.</p>
Threatened species or community and overall value	<p>Broad community is considered to provide Atypical habitat for Western Grasswren, although not 'typical' birds were observed utilising the habitat and chenopod shrublands directly downslope from the habitat. The community is also expected to provide habitat for Southern Whiteface, Blue-winged Parrott and a range of SA threatened species. No threatened flora was observed but it is noted the community represented a unique floristic assemblage for the HJP Project Area (and broader NW Project).</p> <p>Site 1 Project Area</p> <p>Only occurred in the Site 1 Project Area and was in excellent condition.</p> <p>Transmission Line Envelope</p> <p>This community did not occur in the Transmission Line Envelope</p>
	
Plate 5-24. BAM 23 <i>Melaleuca lanceolata</i> tall shrubland over <i>Triodia</i> sp +/- <i>Maireana pyramidata</i> / <i>M. sedifolia</i> / <i>Atriplex vesicaria</i> , Site 1 Project Area	

5.3 Weeds observations

There were 16 exotic species recorded in the HJP Project Area at BAM sites or opportunistically as indicated in Table 5-7.

All weed species were recorded at BAM Sample Points, whilst only weed infestations of note were recorded opportunistically including Declared Plants, WoNS and noxious or isolated environmental weeds. As such, the list does not include a full weed list for the HJP Project Area, rather a representation of the most common and/or noxious species observed. Not represented is the significant increase in weeds near infrastructure corridors east of the Lincoln Highway.

Two WoNS and four Declared plants were observed during the survey as noted in Table 5-7. WoNS and Declared Plant, African Boxthorn (*Lycium ferosissimum*), was observed in several locations and could be scattered throughout the HJP Project Area as isolated individuals, whilst the WoNS / Declared plant, Prickly Pear (*Opuntia stricta*), was observed near the Lincoln Highway and is a conspicuous species easy to detect. Declared Plant, Salvation Jane (*Echium plantaginum*), was observed only once at BAM Sample point 22, whilst Carrion Flower (*Orbea variegata*) was observed in several locations.

The most widespread and commonly observed weeds were Wards Weed (*Carrichtera annua*) and Medic (*Medicago* spp.). Wards Weed was particularly abundant near the north-east of the Site 1 Project Area, including adjacent the track and existing pipeline, contributing to the increased degradation through this area, lessening with increased distance from the track. Other environmental weeds detected include Onion Weed (*Asphodelus fistulosus*), Common Ice Plant (*Mesembryanthemum crystallinum*) and Coastal Galenia (*Aizoon pubescens*).

Figure 5-5 indicates general representative distribution of weeds observed during the field surveys where information was available. This does not represent the extent of infestations or all infestations, only those that were recorded.

Table 5-7. Weeds of National Significance (WoNS) EPBC Act and Declared Weeds (LSA Act) observed in the HJP Project Area.

Species	Common Name	Declared ¹	WoNS ²	Location notes
<i>Aizoon pubescens</i>	Coastal Galenia			BAM Sample Point 60
<i>Asphodelus fistulosus</i>	Onion Weed			BAM Sample Point 7b, 21, 22, 32a, 81
<i>Carrichtera annua</i>	Wards weed			BAM Sample Points 7B, 20, 23, 29, 32a, 32b, 51a, 51b, 52, 53, 54, 55, 56, 57, 58, 60, 61, 62, 81, 06
<i>Carthamus lanatus</i>	Saffron Thistle			BAM Sample Point 62
<i>Echium plantagineum</i>	Salvation Jane	✓		BAM Sample point 22
<i>Limonium companyonis</i>	Sea Lavender			BAM Sample point 56
<i>Lycium ferosissimum</i>	African Boxthorn	✓	✓	BAM Sample point 52, 62
* <i>Medicago</i> sp.	Medic			BAM Sample point 20, 21, 22, 24, 51a, 51b, 53, 58
<i>Mesembryanthemum crystallinum</i>	Ice-Plant			BAM Sample points 22, 32, 51b, 54, 55, 56
<i>Mesembryanthemum nodiflorum</i>	Slender Iceplant			BAM Sample point 7B, 32,
<i>Orbea variegata</i>	Carrion-flower	✓		Widespread but noted near the track in the Site 1 project area and through DoD land. BAM Sample points 56, 60, 62
<i>Opuntia stricta</i>	Erect Prickly Pear	✓	✓	Adjacent the Lincoln Highway

Species	Common Name	Declared ¹	WoNS ²	Location notes
<i>Reichardia tingitana</i>	<i>False Sowthistle</i>			BAM Sample points 29, 51b, 54, 56, 58
<i>Rostraria pumilio</i>				BAM Sample point 62
<i>Rumex vesicarius</i>	Rosy Dock			BAM Sample point 7b
<i>Sisymbrium</i> sp.	Wild Mustard			BAM Sample point 7b, 22, 51a, 51b, 52, 53, 57, 60, 61, 106

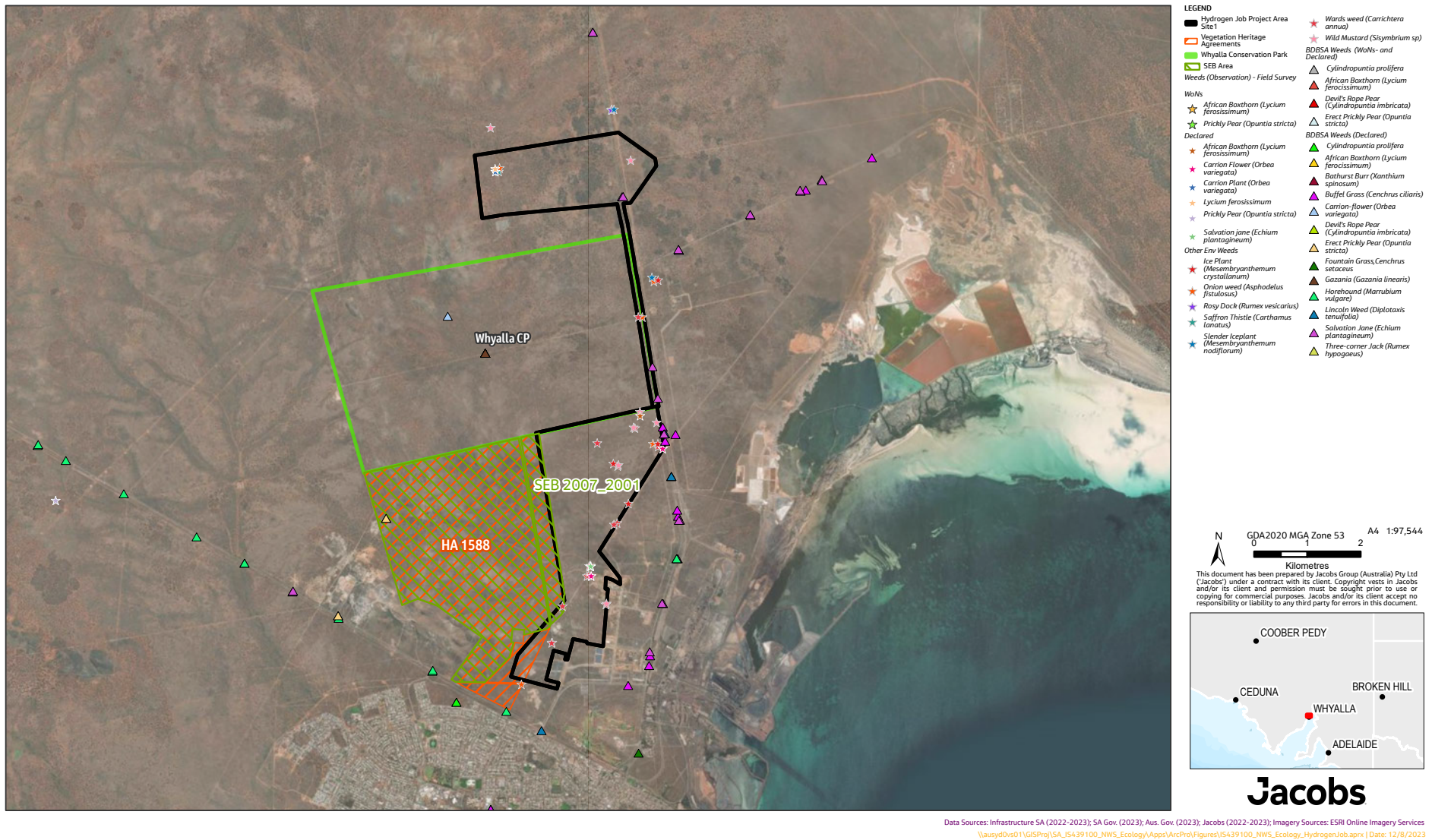


Figure 5-5. Opportunistic Weed observations in the HJP Project Area

5.4 Threatened Ecological Communities (TEC)

As identified above in Section 4.2.1, a single TEC – EPBC Vulnerable Temperate and Sub-tropical Coastal Saltmarsh Coastal Saltmarsh – was highlighted by the PMST as potentially occurring within the HJP Project Area. The field surveys identified there is no samphire vegetation within or directly adjacent the HJP Project Area and it would be impossible for the TEC to occur as the HJP Project Area is away from the coast with no tidal connectivity. None of the vegetation assessed and mapped in the HJP Project Area represents / potentially represents a TEC.

5.5 Habitat for threatened species

The HJP Project Area provides potential habitat for EPBC listed fauna species Western Grasswren and recently listed Southern Whiteface but is not considered to provide habitat for Malleefowl. Suitability of the vegetation present in the HJP Project Area as habitat for these target species is summarised in Table 5-8. The HJP Project Area may be used occasionally by other EPBC listed species, predominantly as an over-fly area for birds of prey and coastal birds.

There is limited habitat present in the HJP Project Area that is suitable for EPBC listed flora species, and no species were detected during surveys to date.

Figure 5-6 shows the location and broad extent of habitat (classified by suitability) for Western Grasswren, along with records for threatened species, whilst Figure 5-7 shows all EPBC listed species observed in the HJP Study Area.

Table 5-8. Habitat suitability for key threatened species.

Threatened Species	Habitat Suitability
Western Grasswren	<p>Vegetation across the majority of the HJP Project Area is considered suitable habitat for Western Grasswren, but the quality and level of habitat suitability varies. Most of the vegetation/habitat is considered Atypical habitat that is still suitable, including approximately 720.2 ha of Atypical habitat and 126.5 ha of Atypical habitat that requires ground-truthing (due to limited survey coverage). Approximately 220.8 ha is considered Preferred habitat (Figure 5-6).</p> <p>Site 1 Project Area</p> <p>There are three main areas of Preferred habitat within the Site 1 Project Area;</p> <ul style="list-style-type: none"> • An extensive area north of the Whyalla water tanks including BAM 22 and BAM 57, representing <i>Acacia papyrocarpa</i> open woodland over <i>Maireana pyramidata</i>. BAM 57 was separated as it occurs in a drainage line and was of particularly high value with large chenopods in excellent condition with increased structural diversity. BAM 22 is more widespread and varies in condition but generally represented high quality habitat. One Western Grasswren was heard in BAM 22 in September 2022 (WGW14, Figure 5-6). • The area south of the Whyalla water tanks in BAM 29 (<i>Myoporum platycarpum</i> low very open woodland over <i>Maireana pyramidata</i>) in which multiple Western grasswren were seen and heard. Birds in this area were observed hopping between <i>M. pyramidata</i>, <i>Exocarpos aphyllus</i> and <i>Alectryon oleifolius</i> bushes with foliage to ground level; in addition to hopping on to taller shrubs and low trees in BAM 29 and adjacent BAM 23 and BAM 58. • An area in the north-west of the Site 1 Project Area, classified previously as BAM 22 and Preferred habitat, but not visited during the more detailed survey in September 2023. <p>These Preferred habitat areas of <i>Acacia papyrocarpa</i> low woodland over chenopods contain taller chenopod shrubs (<i>Maireana pyramidata</i>). Western Grasswren were detected in Preferred habitat (BAM 29) at WGW05 (6-7 individuals detected), WGW07 (1 individual detected), WGW13 (1 individual detected) and heard at WGW14 along the eastern boundary.</p>

Threatened Species	Habitat Suitability
	<p>The majority of the remainder of the Site 1 Project Area was classified as Atypical Western Grasswren habitat dominated by a chenopod shrub-layer of <i>Maireana sedifolia</i> with or without overstorey. Atypical habitat was in variable condition with vegetation of the highest habitat quality located near the Whyalla water tanks on all sides in BAM 58, BAM 60, BAM 56 and in the northwest of the Site 1 Project Area in BAM 32, BAM 52, BAM 53 and parts of BAM 51.</p> <p>Atypical habitat was more degraded in the north-east of the Site 1 Project Area and along the existing pipeline and associated track where shrublands were more open, weeds were more abundant and disturbance areas increased (BAM 55, BAM 54 and the edge of most BAM along the track). Given the condition, this area represents opportunity for the placement of infrastructure for the HJP Project.</p> <p>The southern extent of the Site 1 Project Area in BAM 21 was generally in good condition but less suitable for Western Grasswren with lower <i>Maireana sedifolia</i> and some areas of disturbance in old quarries.</p> <p>Western Grasswren were seen, heard or recorded in Atypical habitat, particularly south of the Whyalla water tanks. In Atypical habitat, Western Grasswren were observed in BAM 58 south of the Whyalla water tanks in October 2022 and September 2023. A Western Grasswren was also heard in BAM 44 in Low Suitable habitat.</p> <p>Small areas of unsuitable habitat occur in the Site 1 Project Area in old quarries and borrow pits in the north east, central east and south of the Project Area.</p> <p>Transmission Line Envelope</p> <p>Preferred Western Grasswren habitat was observed only in the northern extent of the Transmission Line Envelope, west of the Lincoln Highway in BAM 61 and east of the Lincoln Highway in BAM 106. These areas supported <i>Acacia papyrocarpa</i> low woodland over <i>Maireana pyramidata</i> / <i>Atriplex vesicaria</i> (the latter +/- <i>Casuarina pauper</i>).</p> <p>East of the Lincoln Highway BAM 106 (preferred habitat) occurs at the northern and southern end of the funnel-shaped land parcel, but transitions to lower mixed chenopod shrubland in the centre, and classified as Atypical (but noting <i>Maireana pyramidata</i> remains dominant).</p> <p>West of the Lincoln Highway, vegetation transitions from Preferred habitat in BAM 61 to Atypical habitat dominated by <i>Maireana sedifolia</i> further south, noting that much of this area required some level of predictive mapping with on-ground survey focussed near the BAM Sample Points. Another area of Preferred habitat occurs near BAM 32 east of the Lincoln Highway, but outside of this, much of the land east of the Highway had poor on-ground survey coverage.</p> <p>The remainder of the Transmission Line Envelope was classified as Atypical habitat (including some areas classified as "Atypical requires ground truth" where survey coverage was poor). The Whyalla CP was found to be in good to excellent condition (BAM 81, BAM 7), but due to dominant understorey of <i>Maireana sedifolia</i> with only occasional spiny shrubs <i>Rhagodia ulicina</i>, <i>Lycium australe</i> and <i>Maireana pyramidata</i>, the overall classification was Atypical. It is expected that areas within this represent Preferred habitat but in the absence of detailed ground truthing this cannot be confirmed. Regardless, the Whyalla CP is considered known habitat for the species with numerous records of the species within the Conservation Park.</p> <p>In addition to birds observed, heard or recorded during the survey, there are also previous records within 5 km of the project area (BDBSA 2022) predominantly in the Whyalla CP.</p>
Malleefowl	No Mallee habitat was observed within the HJP Project Area nor were any individuals or signs of individuals observed. Overall, the HJP Project Area provides no suitable habitat for this species.
Southern Whiteface	This species was not identified as a target threatened species for field surveys, as it was listed under the EPBC Act 31 March 2023 (post bird survey completion). The most recent survey was targeted vegetation and Western Grasswren habitat mapping over a limited timeframe and did not include targeted Southern

Threatened Species	Habitat Suitability
	<p>Whiteface survey. However, woodlands and tall shrublands with low shrub layers are considered to provide suitable habitat for this species.</p> <p>Site 1 Project Area</p> <p>Suitable habitat in Woodlands including BAM 22, BAM 52, BAM 57, BAM 32, BAM 29, BAM 23 and BAM 44 predominantly occurring around the Whyalla water tanks on all sides and extending north to Whyalla CP, predominantly through the centre and to the north-west, with only smaller patches in the north-east. More open chenopod shrublands with minimal tree cover occur throughout these areas of lesser habitat value. The far south of the Site 1 Project Area is also expected to be of lesser value for the species.</p> <p>There is a previous record from 2011 in the Site 1 Project Area near BAM 57.</p> <p>Transmission Line Envelope</p> <p>The majority of vegetation in the Transmission Line Envelope is expected to provide habitat for Southern Whiteface being dominated by open woodlands including BAM 81, BAM 7, BAM 32, BAM 61, BAM 62 and BAM 106. Smaller areas of open chenopod shrubland are expected to provide lower habitat value (BAM 21, BAM 51, BAM 103).</p> <p>There is one record in the north of the Transmission Line envelope and multiple records outside the envelope but in the Whyalla CP.</p>

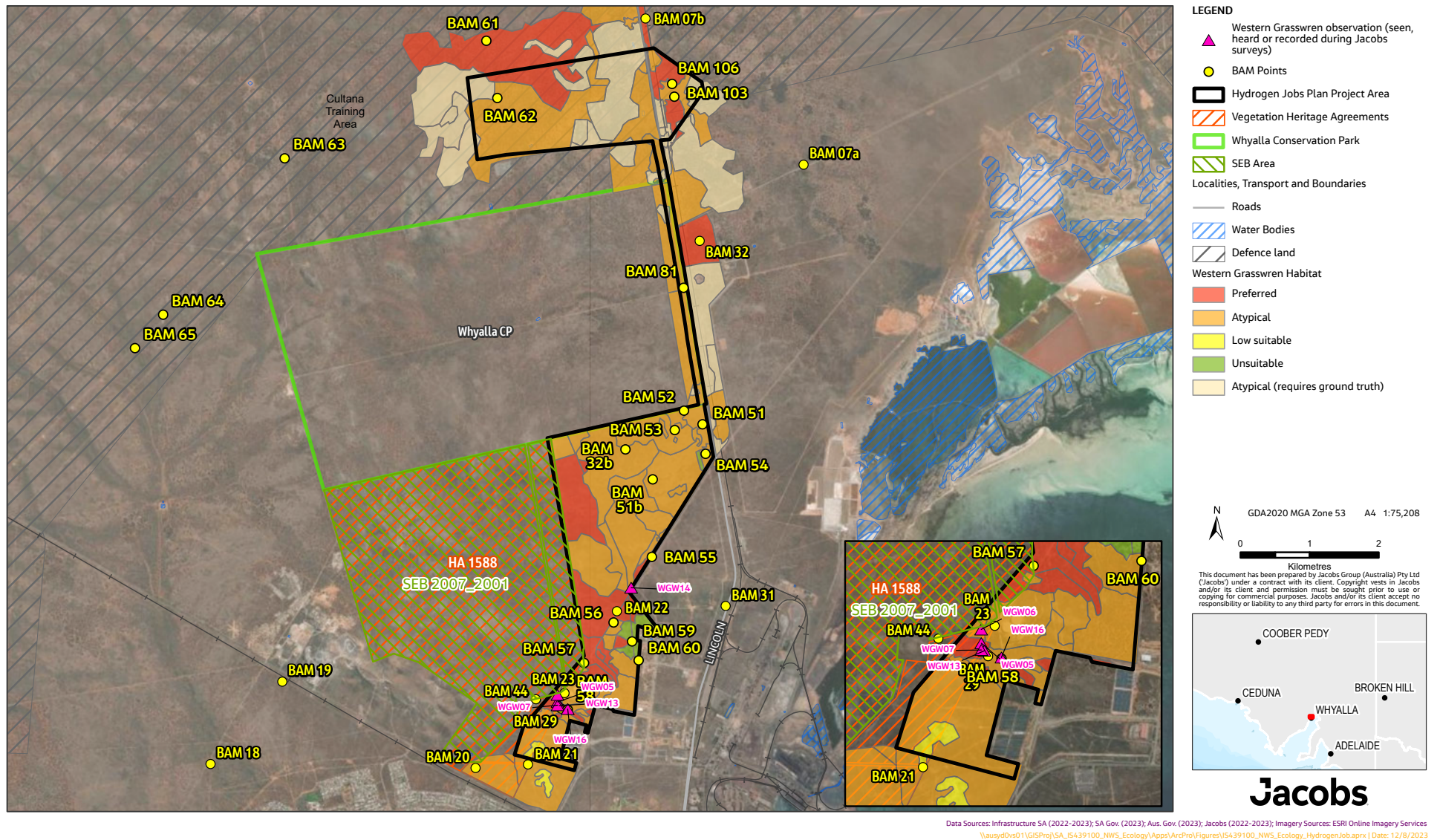


Figure 5-6 Western Grasswren habitat mapping including Western Grasswren observations during Jacobs surveys (seen, heard or recorded).



Plate 5-25. Habitat where Western Grasswren were observed in BAM 58 south of Whyalla water tanks (September 2023)



Plate 5-26. Western Grasswren in BAM 29 (September 2022)

5.6 Fauna Species

A total of 17 native fauna species were observed or detected during the surveys conducted across the five formal survey sites (BS 16, 17, 26, 67 and 76), including 16 birds, and one reptile (not including opportunistic observations). This included one EPBC listed fauna species, Western Grasswren (*Amytornis textilis*) observed / detected at a number of sites within the HJP Project Area (summary details are provided

in Table 5-8 and Table 5-9). EPBC listed species observed are presented on Figure 5-7 (which also indicates BDBSA observations in the HJP Study Area).

A list of observed / detected fauna species within the HJP Project Area is included in Appendix B1.

Table 5-9. Observations of Western Grasswren in the HJP Project Area.

Site Name	Details	General Location	Western Grasswren Habitat Type
WGW05 /WGW06/ WGW07 / BS 26 /BS 76	5-6 individuals observed 1 chased north to others 3 birds heard (conservative)	Whyalla Water Tanks	Preferred (Myall over Black Bluebush, BAM 29) for WGW05 and WGW07 Atypical (BAM 44) for WGW06 but adjacent other sightings in BAM 29
WGW13 / BS 76 / BS 26	Same location as BS 26, 1 bird respond call-play seen / heard	Whyalla Water Tanks	Preferred habitat (BAM 29)
WGW14 near SM07	1 bird, heard	North of Whyalla Water Tanks	Preferred habitat, BAM 22
WGW15 south of water tanks	1 bird seen running in and out of an <i>Exocarpos</i> <i>aphyllus</i> ungrazed with foliage to the ground.	South of Whyalla Water Tanks	Atypical habitat, BAM 58.



Figure 5-7. Western Grasswren observation sites during Jacobs surveys (seen, heard or recorded) and EPBC listed species that have been observed in the HJP Study Area and surrounds

6. Discussion

This report summarises the baseline ecology for the HJP Project Area - including methods and outcomes of the desktop assessment and field assessments. This includes a likelihood of occurrence assessment for Nationally threatened communities and species, broad and detailed vegetation mapping, vegetation descriptions for the HJP Project Area, fauna survey results and high-level habitat mapping for key threatened species of interest.

The Site 1 Project Area has been surveyed in parts across six surveys. Survey 5 included more targeted survey of areas being considered for the HJP infrastructure and survey (survey 6) covered the Transmission Line Envelope.

The field assessments included survey using the BAM assessment (one hectare assessment quadrats) and mapping; in addition to targeted and opportunistic fauna survey and deployment of Song-meters.

The HJP Project Area was stratified into five broad vegetation communities and 22 BAM Sites (vegetation associations), the most prevalent being Low open woodlands of Western Myall over Chenopod shrub understorey and Low open woodlands with Western Myall and Blackoak over Chenopod shrub understorey (Figure 5-1, Figure 5-2, Figure 5-3, Figure 5-4 and Table 4-1). Broad communities in the HJP Project Area are also grouped into three Major Vegetation Groups based on major landform and floristic characteristics (Table 5-1).

6.1 Ecological Constraints

Findings suggest there are several ecological constraints associated with the HJP Project Area and the proposed development of the HJP Project, including potential impact to EPBC listed species (Western Grasswren (VU) and Southern Whiteface (VU)). The HJP Project Area also supports areas with a high abundance of mature trees and is located adjacent and within three areas formally protected for the State, including the Whyalla CP, HA 1588 and SEB 2007_2001.

6.1.1 EPBC Listed Species Habitat

The HJP Project Area has been subject to Western Grasswren habitat mapping across several surveys, with more targeted survey of key areas (where time allowed and access was viable) during September 2023 applying the method developed by Jacobs for a nearby Project (Jacobs 2019).

The value / suitability of habitat for Western Grasswren varies across the HJP Project Area, from highly suitable / high value to medium suitability and value, with several areas that have experienced a high level of disturbance which are considered to be of low quality / value.

The high value / suitability areas include the vegetation associations with less disturbance, taller, more dense shrubs and higher structural diversity. In addition to providing highly suitable habitat for threatened species, the areas of open woodland contain an abundance of mature trees and vegetation that, if disturbed, would take longer to regenerate than Chenopod shrubland areas present in the HJP Project Area. These woodland areas are also considered suitable habitat for recently listed Southern Whiteface.

Black et al (2009) describes Western Grasswren as preferring low shrublands, chiefly comprising *Maireana pyramidata* (Blackbush), *Lycium australe* (Australian boxthorn), noting they also inhabit low woodlands, mostly comprising *Acacia papyrocarpa* (Western Myall) and / or Bullock Bush (Black et al., 2009, Black and Gower 2017). This may include drainage lines, low rocky hills and semi-arid woodlands with preferred vegetation, rarely mallee, commonly with spiny saltbush species (Black and Gower 2017). As the HJP Project Area is almost entirely dominated by Western Myall and Casuarina pauper (Blackoak) woodlands over Chenopod shrublands and Chenopod shrublands without tree cover (or with scattered tree cover), it provides extensive habitat for Western Grasswren.

Although suitable Western Grasswren habitat is widespread through the HJP Project Area, it varies in quality based on the floristic composition and structural features of the vegetation, in addition to disturbance factors

such as historical or current grazing, weed invasion and disturbance due to clearance and proximity to industry.

Optimal (Preferred) habitat in the HJP Project Area (approx. 220 ha) occurred in areas with a shrub layer dominated by large *Maireana pyramidata* bushes, predominantly around the Whyalla water tanks and downslope from the stony rise in the Site 1 Project Area, in addition to patches in the northern extent of the Transmission Line Envelope on both sides of the Lincoln Highway (Figure 5-6). However, in addition to being observed, heard or recorded in Preferred habitat near the Whyalla water tanks, the species was also observed in Atypical habitat dominated by *Maireana sedifolia* near the Whyalla water tanks in areas with large ungrazed *Alectryon oleifolius* (Bullock Bush) and *Exocarpos aphyllus* (Leafless Cherry) with foliage to ground level. These species are highly palatable and rarely observed in such good condition, therefore may not normally provide habitat as they almost always have a high browse line or are hard grazed.

Preferred habitat is also thought to occur in the north-west of the Site 1 Project Area, although this area was not as intensively ground-truthed during targeted surveys. Regardless, the north-west of the Site 1 Project Area is of high value being quite heavily wooded and diverse. The remainder of the HJP Project Area was classified predominantly as Atypical habitat (or Atypical habitat requires ground truth) (approx. 846 ha), with smaller areas classified as Low Suitable and Not Suitable for the species. Within the Atypical habitat occurred smaller unmapped areas of Preferred habitat where Chenopods were taller and composition included *Lycium australe* and *Rhagodia ulicina* which could not be mapped at this scale.

Overall, the Transmission Line Envelope was assessed in less detail than the Site 1 Project Area and Western Grasswren were not observed, heard or recorded. However, all but one Songmeter and Bird survey sites (except BAM sample Points) were positioned east of the Lincoln Highway, and therefore may not provide a reliable indication of the presence or absence of the species (noting fauna are mobile).

One Songmeter was positioned in the funnel-shaped land parcel east of the Lincoln Highway but no Western Grasswren were detected in this location. Regardless, the Whyalla CP provides known habitat for Western Grasswren with numerous historical records. Vegetation in this area was in excellent condition with good diversity and mixed age chenopods but was classified as Atypical habitat as the dominant species was *Maireana sedifolia* with only occasional spiny *Rhagodia ulicina*. A track was noted adjacent the road reserve in the Whyalla CP and although not 'mapped out', the track itself was largely clear of vegetation and of lower value. It was also noted that an underground cable was located near the track with an indicator sign adjacent (east) of the track.

Other valuable areas include Preferred Western Grasswren habitat and woodlands in the far north of the Transmission Line Envelope. In this area, BAM 61 west of the highway in DoD land provided the most valuable (Preferred) Western Grasswren habitat, with areas to the south potentially of less value as they transition to understorey dominance by Chenopod, *Maireana sedifolia*, and lower, more open shrubland (noting the Whyalla CP is considered of very high value). East of the Lincoln Highway, in the funnel-shaped land parcel, BAM 103 and 106 had understorey dominated by *Maireana pyramidata*, however, BAM 106 was considered higher quality habitat as it supported larger / taller shrubs and had an open woodland tree cover also likely to provide increased habitat for Southern Whiteface.

Southern Whiteface was not initially identified as a target species for the 2022 surveys due to its addition as a threatened species under the EPBC Act (on 31 March 2023) occurring post completion of the surveys, however it was included in the desktop assessment and assessed as being known to occur, with one previous record in the Site 1 Project Area and one in the north of the Transmission Line Envelope; in addition to records within the adjacent Whyalla CP and HA.

It was not observed / detected within the HJP Project Area during the surveys, however, there is suitable Open Woodland / Shrubland habitat available. Whilst Southern Whiteface are widespread, their distribution is patchy in woodlands and tall shrublands with grassy / low shrub layers (Menkhorst et al. 2017). They were considered previously common on the edge of dusty country roads with trees nearby, foraging on the ground, preferably where there is less grass cover, feeding on seeds and insects and with nearby trees are used for roosting, perching and avoiding predators (e.g. cats). They are sedentary, occurring in small family groups up to flocks of 20 and often with thornbills (Readers Digest 1977, Menkhorst et al. 2017). Woodlands across the

HJP Project Area are considered to provide the most valuable habitat for this species and could also be considered of high value given the presence of mature slow-growing trees.

Woodlands were also found to be more floristically and structurally diverse with larger chenopods, therefore appeared more suitable for both Western Grasswren and Southern Whiteface. Woodland communities of high value occurred throughout the HJP Project Area but were more prevalent around the Whyalla water tanks (BAM 22, 29, 52, 57, 60) and in the north-west of the Site 1 Project Area (BAM 22, 32 and 52).

In the Transmission Line Envelope, high value woodlands occurred throughout the majority of the envelope (BAM 7, 32, 61, 62, 106 and 81) with some smaller patches of lower value shrublands (BAM 51 and to some degree, BAM 103), noting the latter did have a high abundance of *M. pyramidata*.

Tall shrublands around the Whyalla water tanks were also of high value being floristically diverse and somewhat unique for the local region. Although Atypical to Low suitable habitat for Western Grasswren, the species was observed utilising shrubland habitat in this area (BAM 23, 58 and 44). These communities are also considered suitable habitat for Southern Whiteface.

6.1.2 Conservation Areas

The Site 1 Project Area also adjoins three protected areas, the Whyalla CP to the north (protected under the NPW Act), HA 1588 and SEB 2007_2001 (protected under the NV Act) to the west across the same extent. A portion of these (approximately 34.5 ha) is encompassed by the Site 1 Project Area. The southern area of the Transmission Line Envelope falls within the Whyalla CP but is located adjacent the road and near an internal track.

The intent of Conservation Parks, Heritage Agreements and Significant Environmental Benefit areas is to protect ecological communities and habitat for native flora and fauna, including threatened species, the latter is also associated with offsetting clearance of vegetation in another location. These areas are known to provide habitat for Western Grasswren and Southern Whiteface as well as State threatened (NPW Act) Slender-billed Thornbill (*Acanthiza iredalei*, R), Restless Flycatcher (*Myiagra inquieta*, R), Gilbert's Whistler (*Pachycephala inornata*, R) and *Santalum spicatum* (Sandalwood, V).

In addition to being areas of high value, there are also legal implications relating to encroaching into a protected area and / or causing impact to a protected area.. Every proposal to amend a Heritage Agreement also requires the approval of the NVC, the landholder and the Minister, and will attract a higher SEB (offset) requirement.

Clearance of vegetation within Conservation Parks, Heritage Agreements and other areas established under legislation adopt a loading factor of 100% as part of SEB offset calculations (NVC 2020d). As such, any offset requirements would be double that of vegetation not currently protected under HA. Impacts in Conservation Parks also attract a loading of 100% (x1).

In addition, clearance in SEB areas also attract higher offset requirement in line with NVC policies (noting SEB 2007_2001 occurs west and overlapping the Site 1 Project Area). This includes replacement of the SEB area with a 10% loading for each year to a maximum of ten years (applicable for SEB 2007_2001) in addition to offset for the vegetation clearance itself.

6.2 Opportunities to Minimise Impacts

Areas of lower quality habitat, or areas already disturbed, represent the best opportunities within the HJP Project Area to undertake development of the site whilst avoiding or minimising impacts to the identified ecological values. The lowest quality habitat within the HJP Project Area was observed in previously disturbed areas within old quarries and borrow pits (BAM 59 and parts of BAM 21) and near the existing pipeline and track where chenopod shrubland was more open and degraded (BAM 54, 55 and some parts of BAM 51 near tracks).

The north-east, and the central east of the Site 1 Project Area (BAM 59) presented the most widespread degradation and the lowest quality vegetation and habitat, representing the best option for placement of infrastructure to minimise ecological impacts and loss of habitat for threatened species.

Smaller historical scars also occurred in BAM 21 in the south, and this area was of lower habitat value in general with low and more open *Maireana sedifolia* chenopod shrublands. In addition, a range of tracks dissect the Site 1 Project Area near the Whyalla water tanks, providing existing clear areas that may be suitable for linear infrastructure. These clear areas did not appear to be impacting Western Grasswren occupancy as the species was observed hopping across tracks and utilising bushes near tracks. It was noted the tracks in this area were being utilised by local community for recreational purposes such as walking, running and dog-walking.

Given historical disturbance, the cleared track running adjacent the Lincoln Highway through the Whyalla CP also provides an opportunity to site linear infrastructure.

6.3 Management Considerations

With the exception of Wards Weed and Medic, most weed infestations within the HJP Project Area were isolated with only one or a few individuals. Consideration should be given during planning and construction to avoid spreading weeds (particularly isolated weeds) around the site with particular focus on avoiding introduction of exotic species into protected areas or areas of high value habitat or vegetation. Removal of isolated specimens may also be considered.

Wards Weed also has a tendency to regenerate prolifically following clearance / disturbance and will then spread out from the heavily infested areas and out-compete smaller more herbaceous plants and/or suppress regeneration of perennial shrubs and trees. Consideration of mitigation to reduce the increase and spread of this species during construction and operation would be desirable.

6.4 Conclusion

Vegetation was found to be in good to excellent condition across the HJP Project Area, with degradation exhibited near areas of existing infrastructure and industry, tracks, historical quarries and borrow pits. Overall, for the Site 1 Project Area, the area of highest value vegetation extends downslope from the Whyalla water tanks on all sides, where "Preferred" Western Grasswren habitat was extensive, and vegetation was in excellent condition – i.e., with a high cover of trees and species diversity. Higher value vegetation was also observed in the northwest of the Site 1 Project Area with more heavily wooded and diverse vegetation.

Areas of lower value were observed in the following areas and represent the greatest opportunity to site project infrastructure whilst having lowered impacts to ecological values:

- In the north-east of the Site 1 Project Area and along the existing pipeline track where chenopod shrublands were degraded being more open, with a higher abundance of weeds and evidence of disturbance.
- In the central eastern part of the Site 1 Project Area where a historical excavation / borrow pit supported regenerating vegetation adjacent existing industry.
- In the southern end of the Site 1 Project Area where chenopod shrublands were more open and lower, and old quarries / disturbance sites were scattered throughout. Much of the vegetation in this area is in good condition but is considered to be of lower habitat value.

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Appendix A. PMST output



Australian Government

Department of Climate Change, Energy,
the Environment and Water

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: 23-Nov-2023

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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:	None
Wetlands of International Importance (Ramsar	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	1
Listed Threatened Species:	41
Listed Migratory Species:	45

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:	7
Commonwealth Heritage Places:	None
Listed Marine Species:	80
Whales and Other Cetaceans:	8
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:	3
Regional Forest Agreements:	None
Nationally Important Wetlands:	1
EPBC Act Referrals:	9
Key Ecological Features (Marine):	None
Biologically Important Areas:	2
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

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
Subtropical and Temperate Coastal Saltmarsh	Vulnerable	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			
Amytornis textilis myall			
Western Grasswren (Gawler Ranges) [64454]	Vulnerable	Species or species habitat known to occur within area	In feature area
Aphelocephala leucopsis			
Southern Whiteface [529]	Vulnerable	Species or species habitat known to occur within area	In feature area
Calidris canutus			
Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area	In feature area
Calidris ferruginea			
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Calidris tenuirostris			
Great Knot [862]	Critically Endangered	Species or species habitat known to occur within area	In buffer area only
Charadrius leschenaultii			
Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area	In feature area

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 buffer area only
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat known to occur within area	In feature area
Leipoa ocellata Malleefowl [934]	Vulnerable	Species or species habitat known 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 buffer area only
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In buffer area only
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	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 buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Pedionomus torquatus Plains-wanderer [906]	Critically Endangered	Species or species habitat may occur within area	In feature area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area	In feature area
Stagonopleura guttata Diamond Firetail [59398]	Vulnerable	Species or species habitat may occur within area	In feature area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Species or species habitat known 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 buffer area only
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Thinornis cucullatus cucullatus Eastern Hooded Plover, Eastern Hooded Plover [90381]	Vulnerable	Species or species habitat known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
FISH			
Seriolella brama Blue Warehou [69374]	Conservation Dependent	Species or species habitat likely to occur within area	In buffer area only
Thunnus maccoyii Southern Bluefin Tuna [69402]	Conservation Dependent	Species or species habitat likely to occur within area	In buffer area only
MAMMAL			
Eubalaena australis Southern Right Whale [40]	Endangered	Breeding known to occur within area	In buffer area only
Neophoca cinerea Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat may occur within area	In buffer area only
Sminthopsis psammophila Sandhill Dunnart [291]	Endangered	Species or species habitat likely to occur within area	In feature area
PLANT			
Frankenia plicata [4225]	Endangered	Species or species habitat may occur within area	In feature area
Pterostylis xerophila Desert Greenhood [7997]	Vulnerable	Species or species habitat may occur within area	In feature area
Swainsona pyrophila Yellow Swainson-pea [56344]	Vulnerable	Species or species habitat may occur within area	In feature area
REPTILE			
Aprasia pseudopulchella Flinders Ranges Worm-lizard [1666]	Vulnerable	Species or species habitat may occur within area	In feature area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to 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 buffer area only
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 buffer area only
Ardenna grisea Sooty Shearwater [82651]		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 buffer area only
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Migratory Marine Species			
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area	In buffer area only
Caperea marginata Pygmy Right Whale [39]		Species or species habitat may occur within area	In buffer area only
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Caretta caretta Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area	In buffer area only
Eubalaena australis as Balaena glacialis australis Southern Right Whale [40]	Endangered	Breeding known to occur within area	In buffer area only
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat may occur within area	In buffer area only
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat likely to occur within area	In buffer area only
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat may occur within area	In buffer area only
Migratory Terrestrial Species			
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area	In feature area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area	In feature area
Migratory Wetlands Species			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area
Arenaria interpres Ruddy Turnstone [872]		Species or species habitat known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris acuminata Sharp-tailed Sandpiper [874]	Endangered	Species or species habitat known to occur within area	In feature area
Calidris alba Sanderling [875]		Species or species habitat likely to occur within area	In buffer area only
Calidris canutus Red Knot, Knot [855]		Species or species habitat known to occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Calidris melanotos Pectoral Sandpiper [858]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Calidris ruficollis Red-necked Stint [860]		Species or species habitat known to occur within area	In buffer area only
Calidris tenuirostris Great Knot [862]		Species or species habitat known to occur within area	In buffer area only
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Charadrius veredus Oriental Plover, Oriental Dotterel [882]	Vulnerable	Species or species habitat may occur within area	In feature area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area	In feature area
Gallinago stenura Pin-tailed Snipe [841]		Species or species habitat known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Limosa lapponica Bar-tailed Godwit [844]	Critically Endangered	Species or species habitat known to occur within area	In buffer area only
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]		Species or species habitat known to occur within area	In feature area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area	In buffer area only
Philomachus pugnax Ruff (Reeve) [850]		Species or species habitat known to occur within area	In buffer area only
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat known to occur within area	In feature area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Species or species habitat known to occur within area	In buffer area only

Other Matters Protected by the EPBC Act

Commonwealth Lands [Resource Information]		
The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.		
Commonwealth Land Name	State	Buffer Status
Defence		
Defence - AIRTC WHYALLA [40170]	SA	In buffer area only
Defence - WHYALLA TRAINING DEPOT [40171]	SA	In buffer area only
Defence - WHYALLA TRAINING DEPOT [40172]	SA	In buffer area only
Transport and Regional Services - Australian National Railways Commission		
Commonwealth Land - Australian National Railways Commission [41425]	SA	In buffer area only
Commonwealth Land - Australian National Railways Commission [40934]	SA	In feature area
Commonwealth Land - Australian National Railways Commission [41565]	SA	In feature area

Commonwealth Land Name		State	Buffer Status
Unknown			
Commonwealth Land - [40927]		SA	In buffer area only
Listed Marine Species		[Resource Information]	
Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to 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 buffer area only
Ardenna grisea as Puffinus griseus Sooty Shearwater [82651]		Species or species habitat may occur within area	In buffer area only
Arenaria interpres Ruddy Turnstone [872]		Species or species habitat known to occur within area	In buffer area only
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 known to occur within area	In feature area
Calidris alba Sanderling [875]		Species or species habitat likely to occur within area	In buffer area only
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area overfly marine area	In feature area
Calidris ruficollis Red-necked Stint [860]		Species or species habitat known to occur within area overfly marine area	In buffer area only
Calidris tenuirostris Great Knot [862]	Critically Endangered	Species or species habitat known to occur within area overfly marine area	In buffer area only
Chalcites osculans as Chrysococcyx osculans Black-eared Cuckoo [83425]		Species or species habitat known to occur within area overfly marine area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Charadrius ruficapillus Red-capped Plover [881]		Species or species habitat known to occur within area overfly marine area	In buffer area only
Charadrius veredus Oriental Plover, Oriental Dotterel [882]		Species or species habitat may occur within area overfly marine area	In feature area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area overfly marine area	In feature area
Gallinago stenura Pin-tailed Snipe [841]		Species or species habitat known to occur within area overfly marine area	In buffer area only
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area	In feature area
Himantopus himantopus Pied Stilt, Black-winged Stilt [870]		Species or species habitat known to occur within area overfly marine area	In buffer area only
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In buffer area only
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In buffer area only
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area overfly marine area	In feature area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat likely to occur within area overfly marine area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Onychoprion fuscatus as Sterna fuscata Sooty Tern [90682]		Breeding known to occur within area	In buffer area only
Pachyptila turtur Fairy Prion [1066]		Species or species habitat likely to occur within area	In buffer area only
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area	In buffer area only
Philomachus pugnax Ruff (Reeve) [850]		Species or species habitat known to occur within area overfly marine area	In buffer area only
Phoebastria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Recurvirostra novaehollandiae Red-necked Avocet [871]		Species or species habitat known to occur within area overfly marine area	In buffer area only
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area overfly marine area	In feature area
Sterna striata White-fronted Tern [799]		Migration route may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Sternula nereis as Sterna nereis Fairy Tern [82949]		Breeding known to occur within area	In buffer area only
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Thinornis cucullatus as Thinornis rubricollis Hooded Plover, Hooded Dotterel [87735]		Species or species habitat known to occur within area overfly marine area	In buffer area only
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 buffer area only
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat known to occur within area overfly marine area	In feature area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Species or species habitat known to occur within area overfly marine area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Acentronura australe Southern Pygmy Pipehorse [66185]		Species or species habitat may occur within area	In buffer area only
Filicampus tigris Tiger Pipefish [66217]		Species or species habitat may occur within area	In buffer area only
Heraldia nocturna Upside-down Pipefish, Eastern Upside-down Pipefish, Eastern Upside-down Pipefish [66227]		Species or species habitat may occur within area	In buffer area only
Hippocampus breviceps Short-head Seahorse, Short-snouted Seahorse [66235]		Species or species habitat may occur within area	In buffer area only
Histiogamphelus cristatus Rhino Pipefish, Macleay's Crested Pipefish, Ring-back Pipefish [66243]		Species or species habitat may occur within area	In buffer area only
Hypselognathus rostratus Knifesnout Pipefish, Knife-snouted Pipefish [66245]		Species or species habitat may occur within area	In buffer area only
Kaupus costatus Deepbody Pipefish, Deep-bodied Pipefish [66246]		Species or species habitat may occur within area	In buffer area only
Leptoichthys fistularius Brushtail Pipefish [66248]		Species or species habitat may occur within area	In buffer area only
Lissocampus caudalis Australian Smooth Pipefish, Smooth Pipefish [66249]		Species or species habitat may occur within area	In buffer area only
Lissocampus runa Javelin Pipefish [66251]		Species or species habitat may occur within area	In buffer area only
Maroubra perserrata Sawtooth Pipefish [66252]		Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Notiocampus ruber Red Pipefish [66265]		Species or species habitat may occur within area	In buffer area only
Phycodurus eques Leafy Seadragon [66267]		Species or species habitat may occur within area	In buffer area only
Phyllopteryx taeniolatus Common Seadragon, Weedy Seadragon [66268]		Species or species habitat may occur within area	In buffer area only
Pugnaso curtirostris Pugnose Pipefish, Pug-nosed Pipefish [66269]		Species or species habitat may occur within area	In buffer area only
Solegnathus robustus Robust Pipehorse, Robust Spiny Pipehorse [66274]		Species or species habitat may occur within area	In buffer area only
Stigmatopora argus Spotted Pipefish, Gulf Pipefish, Peacock Pipefish [66276]		Species or species habitat may occur within area	In buffer area only
Stigmatopora nigra Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area	In buffer area only
Stipecampus cristatus Ringback Pipefish, Ring-backed Pipefish [66278]		Species or species habitat may occur within area	In buffer area only
Urocampus carinirostris Hairy Pipefish [66282]		Species or species habitat may occur within area	In buffer area only
Vanacampus margaritifer Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area	In buffer area only
Vanacampus phillipi Port Phillip Pipefish [66284]		Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Vanacampus poecilolaemus Longsnout Pipefish, Australian Long- snout Pipefish, Long-snouted Pipefish [66285]		Species or species habitat may occur within area	In buffer area only
Vanacampus vercoi Verco's Pipefish [66286]		Species or species habitat may occur within area	In buffer area only
Mammal			
Arctocephalus forsteri Long-nosed Fur-seal, New Zealand Fur- seal [20]		Species or species habitat may occur within area	In buffer area only
Arctocephalus pusillus Australian Fur-seal, Australo-African Fur-seal [21]		Species or species habitat may occur within area	In buffer area only
Neophoca cinerea Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat may occur within area	In buffer area only
Reptile			
Caretta caretta Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area	In buffer area only
Whales and Other Cetaceans		[Resource Information]	
Current Scientific Name	Status	Type of Presence	Buffer Status
Mammal			
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area	In buffer area only
Caperea marginata Pygmy Right Whale [39]		Species or species habitat may occur within area	In buffer area only

Current Scientific Name	Status	Type of Presence	Buffer Status
Delphinus delphis Common Dolphin, Short-beaked Common Dolphin [60]	Endangered	Species or species habitat may occur within area	In buffer area only
Eubalaena australis Southern Right Whale [40]		Breeding known to occur within area	In buffer area only
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat may occur within area	In buffer area only
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat may occur within area	In buffer area only
Tursiops aduncus Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		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 buffer area only

Extra Information

State and Territory Reserves			[Resource Information]
Protected Area Name	Reserve Type	State	Buffer Status
Unnamed (No.HA1588)	Heritage Agreement	SA	In feature area
Upper Spencer Gulf	Marine Park	SA	In buffer area only
Whyalla	Conservation Park	SA	In feature area

Nationally Important Wetlands		[Resource Information]
Wetland Name	State	Buffer Status
Upper Spencer Gulf	SA	In buffer area only

EPBC Act Referrals					[Resource Information]
Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status	
Controlled action					
Arafura Whyalla Rare Earths Complex	2011/5877	Controlled Action	Completed	In feature area	
Expansion of the Cultana Training Area	2010/5316	Controlled Action	Post-Approval	In feature area	

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Controlled action				
Expansion of the Olympic Dam copper, uranium, gold and silver mine, processing plant and associated	2005/2270	Controlled Action	Post-Approval	In feature area
Pig Iron Smelter	2001/473	Controlled Action	Completed	In feature area
Pig Iron Smelter (Cultana)	2001/466	Controlled Action	Completed	In feature area
Port Bonython Bulk Commodities Export Facility, SA	2012/6336	Controlled Action	Final PD	In feature area
Not controlled action				
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area
Project Magnet	2004/1724	Not Controlled Action	Completed	In feature area
Whyalla Solar Farm Project, SA	2017/7910	Not Controlled Action	Completed	In feature area

Biologically Important Areas				
Scientific Name		Behaviour	Presence	Buffer Status
Seabirds				
Ardenna tenuirostris				
Short-tailed Shearwater [82652]		Foraging (in high numbers)	Likely to occur	In buffer area only
Sternula nereis				
Fairy Tern [82949]		Foraging	Known to occur	In buffer area only

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 B. Fauna and Flora Species lists

B.1 Summary of Fauna Species Detected, Site 1 Hydrogen Jobs Plan

Songmeter location							SM07	Opportunistic
WGW #					WGW05, WGW06, WGW07	WGW13	WGW14	
Closest Bird Survey #					16	26	76	
Common name	Scientific name	Family name	EPBC	NPWSA			N/A	
Australian Grebe	<i>Tachybaptus novaehollandiae</i>	009 Podicipedidae						O
Australian Gull-billed Tern	<i>Gelochelidon macrotarsa</i>	046 Laridae						O
Australian Magpie	<i>Cracticus tibicen</i>	080 Artamidae						O
Australian Owlet-Nightjar	<i>Aegotheles cristatus</i>	016 Aegothelidae						O
Australian Pelican	<i>Pelecanus conspicillatus</i>	030 Pelecanidae						O
Australian Reed-Warbler	<i>Acrocephalus australis</i>	092 Acrocephalidae						O
Australian Wood Duck	<i>Chenonetta jubata</i>	008 Anatidae						O
Black Swan	<i>Cygnus atratus</i>	008 Anatidae						O
Black-faced Woodswallow	<i>Artamus cinereus</i>	080 Artamidae						O
Budgerigar	<i>Melopsittacus undulatus</i>	059 Psittaculidae			O			
Chestnut-rumped Thornbill	<i>Acanthiza uropygialis</i>	069 Acanthizidae			O			
Chirruping Wedgebill	<i>Psophodes cristatus</i>	078 Psophodidae						O
Common Blackbird*	<i>Turdus merula</i>	099 Turdidae						O
Common Bronzewing	<i>Phaps chalcoptera</i>	012 Columbidae						O
Common Starling*	<i>Sturnus vulgaris</i>	098 Sturnidae						O
Crested Bellbird	<i>Oreoica gutturalis</i>	074 Oreoidae				O		
Crested Pigeon	<i>Ocyphaps lophotes</i>	012 Columbidae			O	O		
Crimson Chat	<i>Epthianura tricolor</i>	067 Meliphagidae						O
Elegant Parrot	<i>Neophema elegans</i>	059 Psittaculidae		rare				O
Emu	<i>Dromaius novaehollandiae</i>	002 Casuariidae						O
Galah	<i>Eolophus roseicapillus</i>	058 Cacatuidae						O
Grey Teal	<i>Anas gracilis</i>	008 Anatidae						O
Hardhead	<i>Aythya australis</i>	008 Anatidae						O
Horsfield's Bronze-Cuckoo	<i>Chrysococcyx basalis</i>	018 Cuculidae				O		
House Sparrow*	<i>Passer domesticus</i>	104 Passeridae						O
Little Black Cormorant	<i>Phalacrocorax sulcirostris</i>	033 Phalacrocoracidae						O
Little Crow	<i>Corvus bennetti</i>	086 Corvidae						O
Little Pied Cormorant	<i>Microcarbo melanoleucos</i>	033 Phalacrocoracidae						O
Masked Lapwing	<i>Vanellus miles</i>	039 Charadriidae						O
Masked Woodswallow	<i>Artamus personatus</i>	080 Artamidae						O
Mistletoebird	<i>Dicaeum hirundinaceum</i>	101 Dicaeidae			O			
Orange Chat	<i>Epthianura aureus</i>	067 Meliphagidae						O
Pacific Black Duck	<i>Anas superciliosa</i>	008 Anatidae						O
Pallid Cuckoo	<i>Cacomantis pallidus</i>	018 Cuculidae				O		
Pied Stilt	<i>Himantopus leucocephalus</i>	038 Recurvirostridae						O
Purple-backed Fairywren	<i>Malurus assimilis</i>	065 Maluridae				O	O	
Purple-crowned Lorikeet	<i>Parvipsitta porphyrocephala</i>	059 Psittaculidae						O
Rainbow Lorikeet	<i>Trichoglossus moluccanus</i>	059 Psittaculidae						O
Red-capped Plover	<i>Charadrius ruficapillus</i>	039 Charadriidae						O
Red-necked Stint	<i>Calidris ruficollis</i>	043 Scolopacidae						O
Redthroat	<i>Pyrholaemus brunneus</i>	069 Acanthizidae						O
Rock Dove*	<i>Columba livia</i>	012 Columbidae						O
Rufous Fieldwren	<i>Calamanthus campestris</i>	069 Acanthizidae						O
Sharp-tailed Sandpiper	<i>Calidris acuminata</i>	043 Scolopacidae						O
Silver Gull	<i>Chroicocephalus novaehollandiae</i>	046 Laridae						O
Silvereye	<i>Zosterops lateralis</i>	097 Zosteropidae						O
Singing Honeyeater	<i>Gavicalis virescens</i>	067 Meliphagidae			O	O		O
Spiny-cheeked Honeyeater	<i>Acanthagenys rufogularis</i>	067 Meliphagidae			O	O		O
Splendid Fairywren	<i>Malurus splendens</i>	065 Maluridae			O			
Spotted Dove*	<i>Spilopelia chinensis</i>	012 Columbidae						O
Tree Martin	<i>Petrochelidon nigricans</i>	094 Hirundinidae						O
Welcome Swallow	<i>Hirundo neoxena</i>	094 Hirundinidae						O
Western Grasswren	<i>Amytornis textilis</i>	065 Maluridae	VU	vu		O	O	
Whistling Kite	<i>Haliastur sphenurus</i>	051 Accipitridae						O
White-backed Swallow	<i>Cheramoeca leucosternon</i>	094 Hirundinidae						O
White-browed Babbler	<i>Pomatostomus superciliosus</i>	071 Pomatostomidae			O	O		O
White-browed Woodswallow	<i>Artamus superciliosus</i>	080 Artamidae						O
White-fronted Honeyeater	<i>Purnella albifrons</i>	067 Meliphagidae				O		O
White-plumed Honeyeater	<i>Ptilotula penicillata</i>	067 Meliphagidae						O
White-winged Chough	<i>Corcorax melanorhamphos</i>	087 Corcoracidae		rare				O
White-winged Fairywren	<i>Malurus leucopterus</i>	065 Maluridae			O	O	O	
Willie Wagtail	<i>Rhipidura leucophrys</i>	082 Rhipiduridae						O
Yellow-plumed Honeyeater	<i>Lichenostomus ornatus</i>	067 Meliphagidae						O
No of species:					4	3		52
* = introduced species								
O = observed during surveys								

B.2 B.2 Summary of Flora Species Detected by BAM Site, Site 1 Hydrogen Jobs Plan

PLANT NAME		LISTING STATUS					BAM SITE								
SPECIES	COMMON NAME	Declared	WoNS	EPBC	NPW SA	BIOREGSTAT	BAM7B	BAM20	BAM21	BAM22	BAM23	BAM24	BAM29	BAM32	BAM44
<i>Abutilon otocarpum</i>	Desert Lantern-bush					RA			x						
<i>Acacia continua</i>	Thorn Wattle					LC					x				
<i>Acacia notabilis</i>	Notable Wattle					LC					x				
<i>Acacia oswaldii</i>	Umbrella Wattle					LC	x								
<i>Acacia papyrocarpa</i>	Western Myall					NT	x			x	x			x	
<i>Alectryon oleifolius ssp. canescens</i>	Bullock Bush					LC					x	x	x	x	
<i>Amyema sp.</i>	Mistletoe											x			
<i>Atriplex holocarpa</i>	Pop Saltbush					LC		x		x					
<i>Atriplex vesicaria</i>	Bladder Saltbush						x	x		x	x	x	x	x	
<i>Austrostipa nitida</i>	Balcarra Spear-grass					LC									x
<i>Austrostipa platychaeta</i>	Flat-awn Spear-grass					LC						x			
<i>Austrostipa sp.</i>	Spear-grass						x	x	x	x		x	x	x	
<i>Brachyscome ciliaris var. lanuginosa</i>	Woolly Variable Daisy					RA			x	x					
<i>Carpobrotus rossii</i>	Native Pigface					NT									x
<i>Casuarina pauper</i>	Black Oak					LC	x							x	
<i>Chenopodium auricomum</i>	Golden Goosefoot					LC	x								
<i>Chenopodium curvispicatum</i>	Cottony Goosefoot					LC					x				
<i>Chenopodium desertorum ssp.</i>	Desert Goosefoot								x	x		x		x	
<i>Convolvulus erubescens/remotus (NC)</i>	Native Bindweed										x				
<i>Convolvulus remotus</i>	Grassy Bindweed					LC								x	
<i>Cynanchum viminale ssp. australe</i>	Caustic Bush					LC			x		x				x
<i>Dianella brevicaulis</i>	Short-stem Flax-lily					LC					x				
<i>Dissocarpus biflorus var.</i>	Two-horn Saltbush							x		x					
<i>Dissocarpus paradoxus</i>	Ball Bindyi					LC	x								
<i>Dodonaea lobulata</i>	Lobed-leaf Hop-bush					LC			x						x
<i>Dodonaea viscosa ssp. angustissima</i>	Narrow-leaf Hop-bush					LC									x
<i>Enchylaena tomentosa var.</i>	Ruby Saltbush						x		x		x	x		x	
<i>Enneapogon avenaceus</i>	Common Bottle-washers					LC		x							
<i>Enneapogon nigricans</i>	Black-head Grass						x								
<i>Eremophila alternifolia</i>	Narrow-leaf Emubush					LC			x		x	x	x		x
<i>Eremophila longifolia</i>	Weeping Emubush					LC				x	x				
<i>Eremophila oppositifolia ssp.</i>	Opposite-leaved Emubush									x					
<i>Eremophila oppositifolia ssp. oppositifolia</i>	Opposite-leaved Emubush					LC									x
<i>Eremophila scoparia</i>	Broom Emubush					LC						x			
<i>Eriochiton sclerolaenoides</i>	Woolly-fruit Bluebush					NT	x								
<i>Eriochiton sp.</i>														x	
<i>Euphorbia drummondii (NC)</i>							x								
<i>Euphorbia tannensis ssp. (NC)</i>	Desert Spurge										x				
<i>Exocarpos aphyllus</i>	Leafless Cherry					LC					x		x		
<i>Geijera linearifolia</i>	Sheep Bush					LC						x			
<i>Halgania cyanea</i>	Rough Blue-flower					LC					x				
<i>Lycium australe</i>	Australian Boxthorn					LC	x		x		x	x			
<i>Maireana brevifolia</i>	Short-leaf Bluebush					LC	x								
<i>Maireana pyramidata</i>	Black Bluebush					LC	x	x	x	x			x	x	
<i>Maireana sedifolia</i>	Bluebush					NT	x		x	x		x	x	x	x
<i>Maireana trichoptera</i>	Hairy-fruit Bluebush					LC		x		x					
<i>Maireana turbinata</i>	Top-fruit Bluebush					LC	x	x		x		x		x	
<i>Melaleuca lanceolata</i>	Dryland Tea-tree					NT					x				
<i>Minuria annua</i>	Annual Minuria					RA			x						
<i>Minuria cunninghamii</i>	Bush Minuria					LC			x	x					

SPECIES	COMMON NAME	Declared	WoNS	EPBC	NPW SA	BIOREGSTAT	BAM7B	BAM20	BAM21	BAM22	BAM23	BAM24	BAM29	BAM32	BAM44
<i>Minuria leptophylla</i>	Minnie Daisy					LC	x								
<i>Myoporum platycarpum</i> ssp.	False Sandalwood						x		x			x	x	x	
<i>Myoporum platycarpum</i> ssp. <i>platycarpum</i>	False Sandalwood					LC									x
<i>Olearia calcarea</i>	Crinkle-leaf Daisy-bush					RA						x			
<i>Olearia pimeleoides</i>	Pimelea Daisy-bush					LC						x			
<i>Oxalis perennans</i>	Native Sorrel					LC						x			
<i>Pimelea microcephala</i> ssp.	Shrubby Riceflower											x			
<i>Pittosporum angustifolium</i>	Native Apricot					LC								x	
<i>Ptilotus obovatus</i>	Silver Mulla Mulla								x	x	x				x
<i>Rhagodia spinescens</i>	Spiny Saltbush					LC			x	x	x	x			x
<i>Rhagodia ulicina</i>	Intricate Saltbush					LC	x					x		x	
<i>Roepera apiculata</i>	Pointed Twinleaf					LC					x				
<i>Roepera billardieri</i>	Coast Twinleaf									x					
<i>Rytidosperma setaceum</i>	Small-flower Wallaby-grass					LC									x
<i>Rytidosperma</i> sp.	Wallaby-grass								x		x				
<i>Salsola australis</i>	Buckbush					LC	x	x		x				x	
<i>Santalum acuminatum</i>	Quandong					LC								x	
<i>Sarcozona</i> sp.	Noon-flower							x	x						
<i>Scaevola spinescens</i>	Spiny Fanflower					LC			x			x	x		x
<i>Sclerolaena diacantha</i>	Grey Bindyi					LC	x		x	x					
<i>Sclerolaena obliquicuspis</i>	Oblique-spined Bindyi					LC	x	x		x		x		x	
<i>Sclerolaena patenticuspis</i>	Spear-fruit Bindyi					LC		x						x	
<i>Sclerolaena uniflora</i>	Small-spine Bindyi					LC	x								
<i>Senna artemisioides</i> ssp. <i>artemisioides</i> x ssp. <i>coriacea</i>	Desert Senna														x
<i>Senna artemisioides</i> ssp. <i>filifolia</i>	Fine-leaf Desert Senna					LC								x	
<i>Senna artemisioides</i> ssp. <i>X artemisioides</i>	Silver Senna					LC				x					
<i>Senna artemisioides</i> ssp. <i>X coriacea</i>	Broad-leaf Desert Senna					LC	x	x	x	x	x	x		x	
<i>Setaria constricta</i>	Knotty-butt Paspalidium					LC			x	x					
<i>Sida fibulifera</i>	Pin Sida					LC	x		x	x	x		x		
<i>Sida intricata</i>	Twiggy Sida					VU	x	x	x	x					
<i>Sida petrophila</i>	Rock Sida					LC		x	x	x	x				
<i>Solanum ellipticum</i> (NC)	Velvet Potato-bush									x					
<i>Sonchus</i> sp.	Sow-thistle										x				
<i>Tetragonia tetragonioides</i> (NC)	New Zealand Spinach						x								
<i>Triodia</i> sp.	Spinifex										x				
<i>Vittadinia cuneata</i> var.	Fuzzy New Holland Daisy								x	x		x			
<i>Westringia rigida</i>	Stiff Westringia					LC					x				
* <i>Asphodelus fistulosus</i>	Onion Weed						x		x	x				x	
* <i>Carrichtera annua</i>	Ward's Weed						x	x		x	x	x	x	x	
* <i>Echium plantagineum</i>	Salvation Jane	Y								x					
* <i>Medicago polymorpha</i>	Burr-medic											x			
* <i>Medicago</i> sp.	Medic							x	x	x					
* <i>Mesembryanthemum crystallinum</i>	Common Iceplant									x				x	
* <i>Mesembryanthemum nodiflorum</i>	Slender Iceplant						x							x	
* <i>Reichardia tingitana</i>	False Sowthistle												x		
* <i>Rumex vesicarius</i>	Rosy Dock						x								
* <i>Sisymbrium</i> sp.	Wild Mustard						x			x					

Attachment G WHP disturbance area maps

The following attachment comprises 10 maps covering the WHP alignment:

- Maps 1 to 5 cover the disturbance area shown in Figure 2-2.
- Maps 6 to 10 cover the disturbance area shown in Figure 2-3.

CLIENT: Epic Energy
PROJECT: Whyalla Hydrogen Pipeline Project
TITLE: Indicative WHP alignment and disturbance area map 1 of 10.
DATE: 18th December 2024
DATA SOURCE:
Existing gas / liquids pipelines supplied by Epic Energy
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> Prepared by Mipela G.I.S > Phone: +61-7-3252 5589
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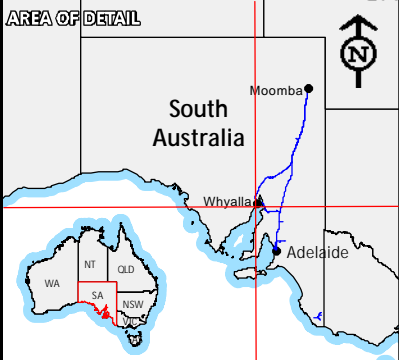
SCALE: 1:10,000 (A4) GDA2020 Lat/Long
0.2 0 0.2
Kilometers

LEGEND

- WHP alignment
- Existing gas / liquids pipelines
- Existing Disturbance Footprint
- Temporary Disturbance Footprint
- Permanent Disturbance Footprint



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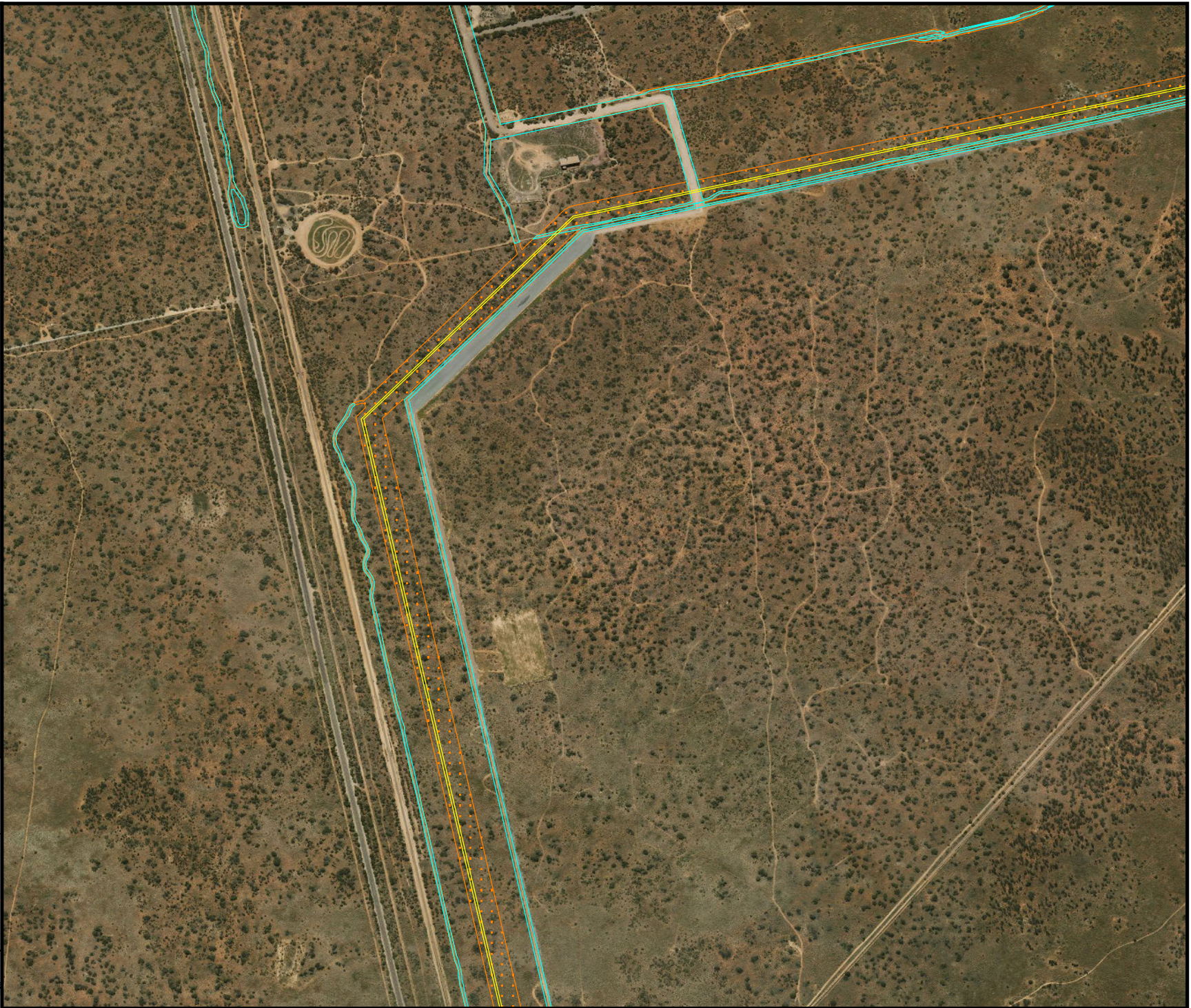
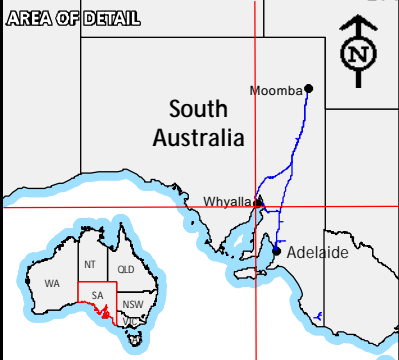
CLIENT: Epic Energy
PROJECT: Whyalla Hydrogen Pipeline Project
TITLE: Indicative WHP alignment and disturbance area map 2 of 10.
DATE: 18th December 2024
DATA SOURCE:
Existing gas / liquids pipelines supplied by Epic Energy
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> Web: www.mipela.com.au > Email: info@mipela.com.au

SCALE: 1:10,000 (A4) GDA2020 Lat/Long
0.2 0 0.2
Kilometers

- LEGEND**
- WHP alignment
 - Existing gas / liquids pipelines
 - Existing Disturbance Footprint
 - Temporary Disturbance Footprint
 - Permanent Disturbance Footprint

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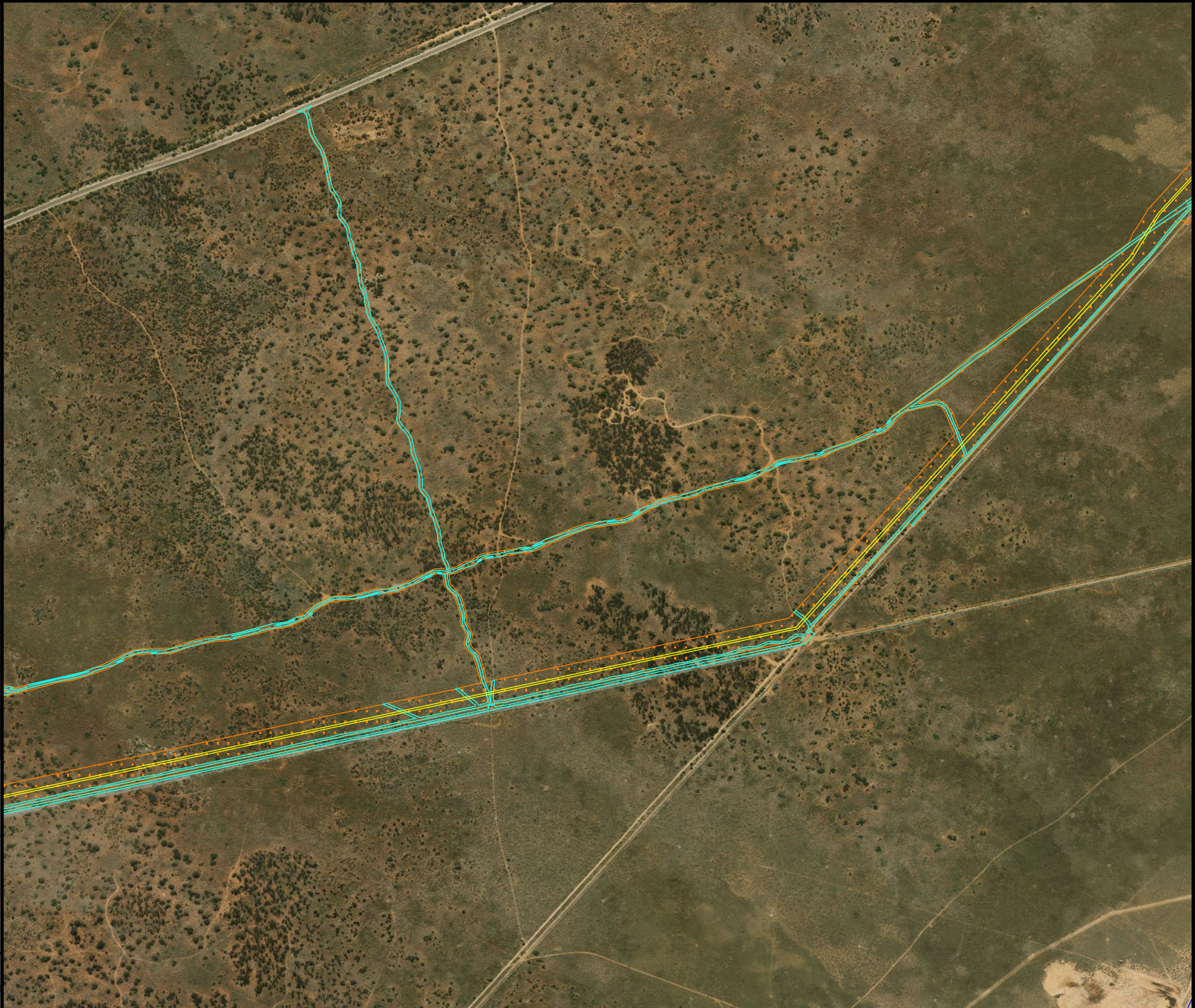
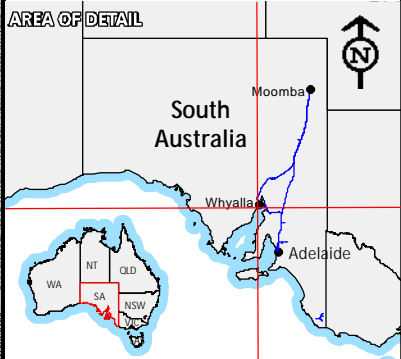
CLIENT: Epic Energy
PROJECT: Whyalla Hydrogen Pipeline Project
TITLE: Indicative WHP alignment and disturbance area map 3 of 10.
DATE: 18th December 2024
DATA SOURCE:
Existing gas / liquids pipelines supplied by Epic Energy
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SCALE: 1:10,000 (A4) GDA2020 Lat/Long
0.2 0 0.2
Kilometers

- LEGEND**
- WHP alignment
 - Existing gas / liquids pipelines
 - Existing Disturbance Footprint
 - Temporary Disturbance Footprint
 - Permanent Disturbance Footprint

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CLIENT: Epic Energy
PROJECT: Whyalla Hydrogen Pipeline Project
TITLE: Indicative WHP alignment and disturbance area map 4 of 10.

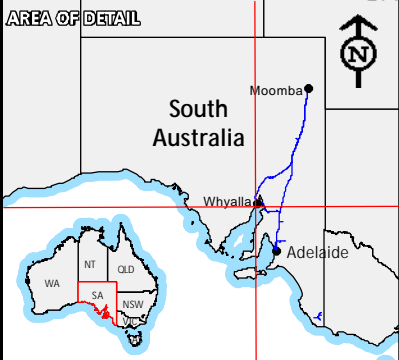
DATE: 18th December 2024
DATA SOURCE:
Existing gas / liquids pipelines supplied by Epic Energy
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SCALE: 1:10,000 (A4) GDA2020 Lat/Long
0.2 0 0.2
Kilometers

- LEGEND
- WHP alignment
 - Existing gas / liquids pipelines
 - Existing Disturbance Footprint
 - Temporary Disturbance Footprint
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PROJECT: Whyalla Hydrogen Pipeline Project
TITLE: Indicative WHP alignment and disturbance area map 5 of 10.

DATE: 18th December 2024

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SCALE: 1:10,000 (A4) GDA2020 Lat/Long



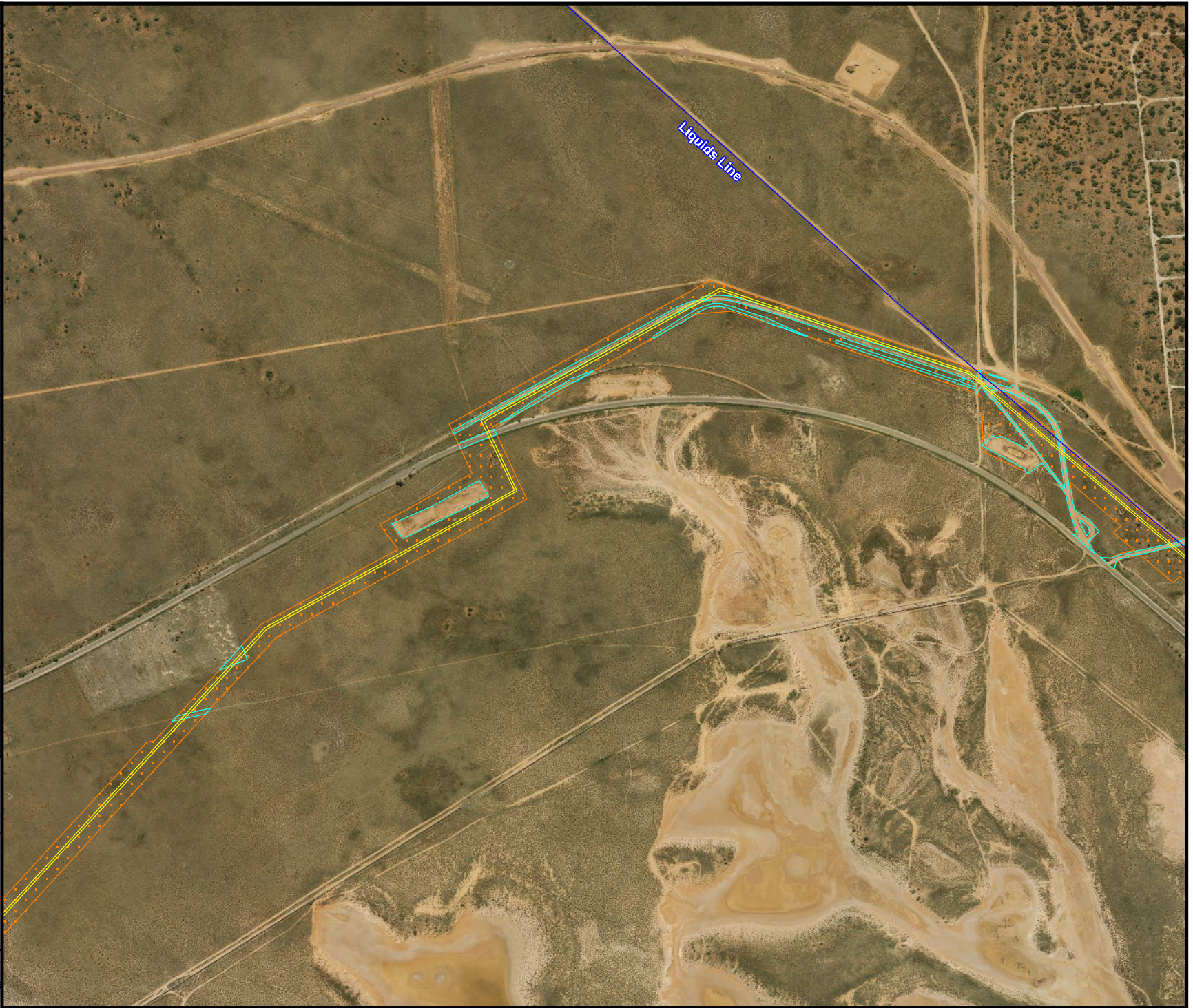
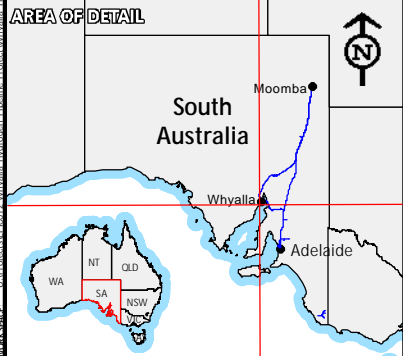
LEGEND

- WHP alignment
- Existing gas / liquids pipelines
- Existing Disturbance Footprint
- Temporary Disturbance Footprint
- Permanent Disturbance Footprint



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AREA OF DETAIL



WORKSPACE: I:\Projects\EP10012 Whyalla Hydrogen Pipeline Project\Whyalla Hydrogen Pipeline\Workspaces\20241218 WHP Project Indicative WHP alignment and disturbance area map 5 of 10.wg

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PROJECT: Whyalla Hydrogen Pipeline Project
TITLE: Indicative WHP alignment and disturbance area map 6 of 10.

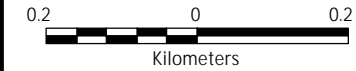
DATE: 18th December 2024

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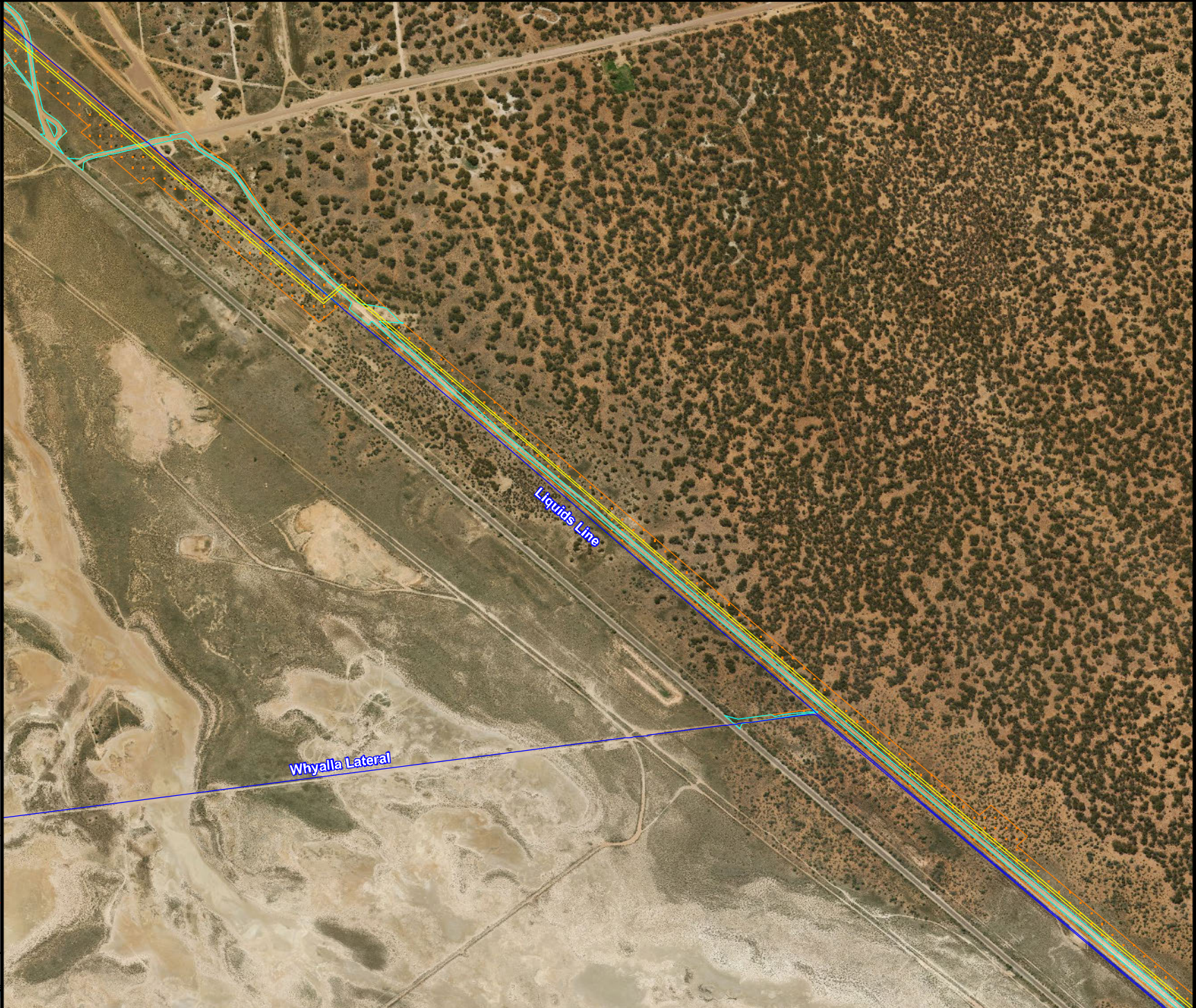
LEGEND

- WHP alignment
- Existing gas / liquids pipelines
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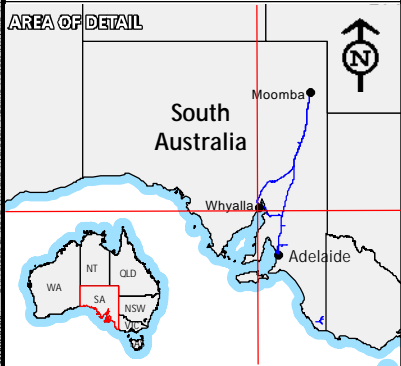
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PROJECT: Whyalla Hydrogen Pipeline Project
TITLE: Indicative WHP alignment and disturbance area map 7 of 10.
DATE: 18th December 2024
DATA SOURCE:
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SCALE: 1:10,000 (A4) GDA2020 Lat/Long
0.2 0 0.2
Kilometers

- LEGEND**
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PROJECT: Whyalla Hydrogen Pipeline Project
TITLE: Indicative WHP alignment and disturbance area map 8 of 10.

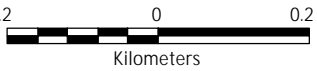
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LEGEND

- WHP alignment
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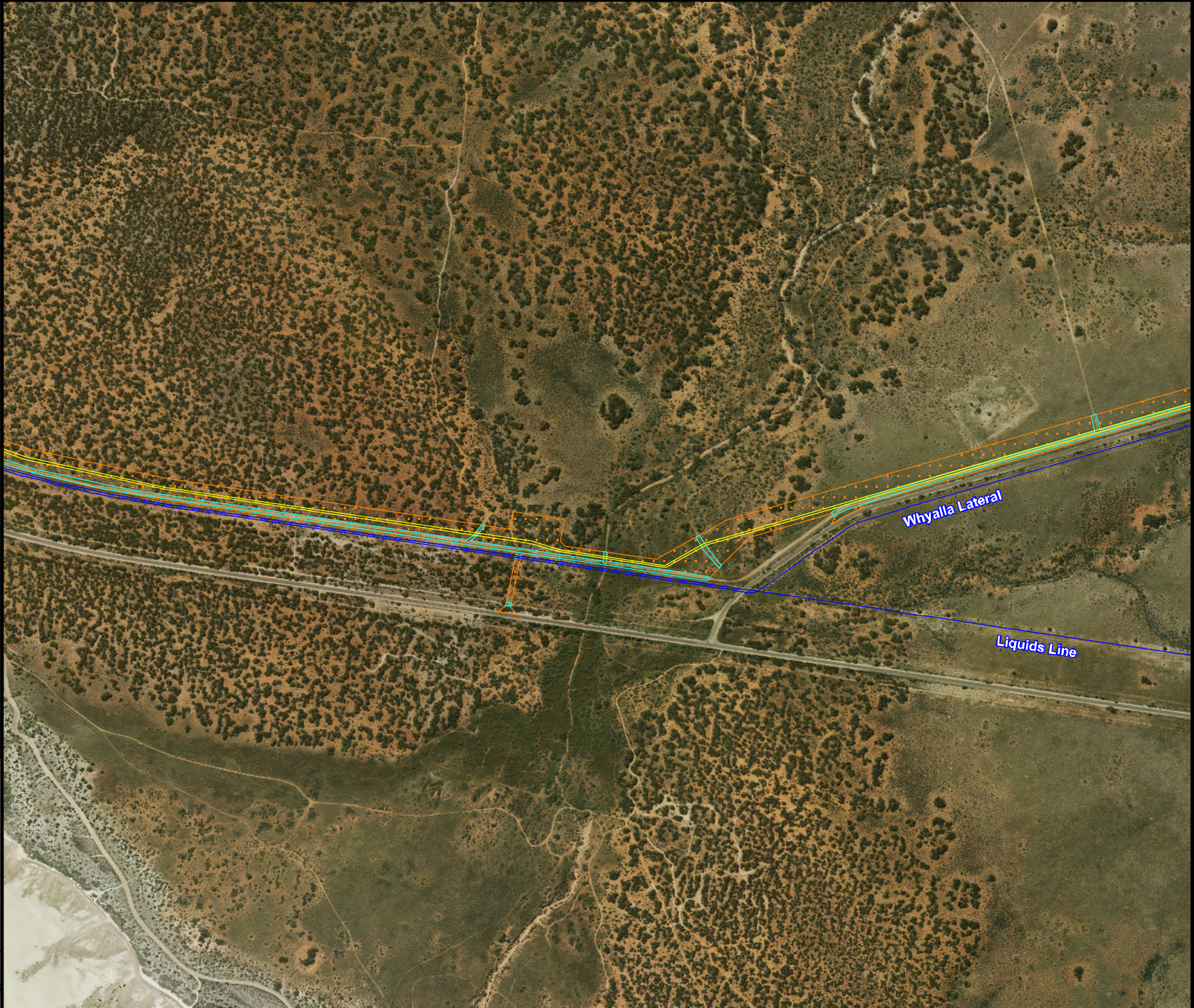
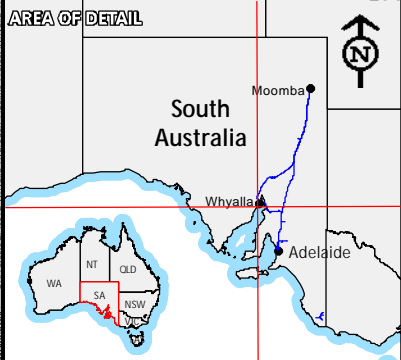
CLIENT: Epic Energy
PROJECT: Whyalla Hydrogen Pipeline Project
TITLE: Indicative WHP alignment and disturbance area map 9 of 10.
DATE: 18th December 2024
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Kilometers

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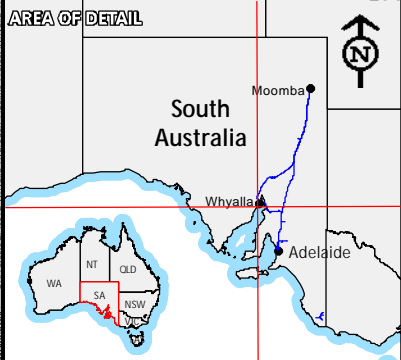
CLIENT: Epic Energy
PROJECT: Whyalla Hydrogen Pipeline Project
TITLE: Indicative WHP alignment and disturbance area map 10 of 10.
DATE: 18th December 2024
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