

Mapping of legislated biodiversity values to inform DEM HRE Gawler Ranges East proposed release area:

Summary of DEW approach,
outputs, and interpretation
considerations | September
2024



**Government
of South Australia**

Department for
Environment and Water

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Introduction

The Department for Environment and Water (DEW) has provided mapping of legislated biodiversity values ('biodiversity values' hereafter) to the Department for Energy and Mining (DEM) to support planning needs under the *Hydrogen and Renewable Energy Act 2023* (HRE Act).

DEW has maintained timely and transparent sharing of data and information on biodiversity values to provide DEM with crucial insights for strategic zoning in the HRE Act release area determination process.

These September 2024 biodiversity values mapping outputs aim to inform DEM's planning and determination of proposed release areas to avoid or minimise environmental impacts.

DEW's biodiversity values mapping outputs were one of many considerations applied by DEM as part of delineating this proposed HRE Act release area ('Gawler Ranges East proposed release area' hereafter).

This document summarises the approach, outputs, and interpretation considerations and limitations of DEW's mapping of biodiversity values. It is made available via DEM's public consultation materials on the Gawler Ranges East Proposed Release Area in Upper Spencer Gulf-Gawler Ranges.

Mapping of biodiversity values: approach and interpretation considerations

DEW's robust evidence-based approach to mapping biodiversity values has been designed to provide a clear line of sight between biodiversity values and applicable state and Commonwealth environmental legislation and policies.

DEW's approach to mapping biodiversity values to support planning and development under the HRE Act spatially delineated biodiversity values protected by existing legislation within the Gawler Ranges East proposed release area. The specific biodiversity values and legislation include:

- native vegetation under the South Australian *Native Vegetation Act 1991* (Native Vegetation Act)
- threatened species and ecological communities under the national *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)
- threatened species under the South Australian *National Parks and Wildlife Act 1972* (NPW Act).

DEW's method integrated data from all available sources to identify likely biodiversity values within DEM's Gawler Ranges East proposed release area.

Modelled spatial distributions were generated for each biodiversity value, which is crucial for planning due to the often sparse and point-based nature of existing biodiversity data. This process is executed through a scripted workflow, enabling rapid updates as new data becomes available.

DEW's biodiversity values mapping outputs are for informational purposes only. They do not constitute a legal interpretation under relevant legislation.

DEW's biodiversity values outputs and their application

DEW's biodiversity values workflow has been designed to generate modelled spatial information summaries related to landscapes, ecosystems, and species within the Gawler Ranges East proposed release area (summarised below). No EPBC Act listed threatened ecological communities were found to occur in the proposed release area.

DEW mapping of legislated biodiversity values to inform HRE | *September 2024 outputs*

BIOLOGICAL HIERARCHY:

LANDSCAPES



POLICY FRAMEWORK:

Focus: sustainable resource utilisation.
Examples: *Pastoral Land Management and Conservation Act 1989*, *Native Vegetation Act 1991*, *Landscape South Australia Act 2019*.

DEW HRE OUTPUTS:

Native vegetation cover (2010-2015 epoch derived from Landsat satellite imagery at 30-metre resolution).

ECOSYSTEM



Focus: conservation of biodiversity.
Examples: *Environment Protection and Biodiversity Conservation Act 1999*.

N/A - No EPBC Act listed threatened ecological communities found to occur in proposed release area.

SPECIES



Focus: conservation of biodiversity.
Examples: *Environment Protection and Biodiversity Conservation Act 1999*, *National Parks and Wildlife Act 1972*.

EPBC Act / NPW Act listed threatened species (distribution models 90-metre grid or habitat associations).

DEW's biodiversity values mapping indicates biodiversity values that must be considered for:

- delineating broad landscape areas
- identifying particular land units or habitat types
- targeting surveys so that developments can be designed to avoid and/or mitigate impacts
- developing environmental objectives and environmental impact reports by proponents to address the impacts of development operations.

Landscape outputs

The landscape-level outputs provide representation of native vegetation coverage at 30-metre grid resolution, derived from Landsat satellite imagery over the period 2010-2015 (Figure 1, Figure 2). This geographic information system (GIS) dataset represents native vegetation coverage for South Australia and was generated by the Arthur Rylah Institute for Environmental Research (part of the State Government of Victoria) for DEW.

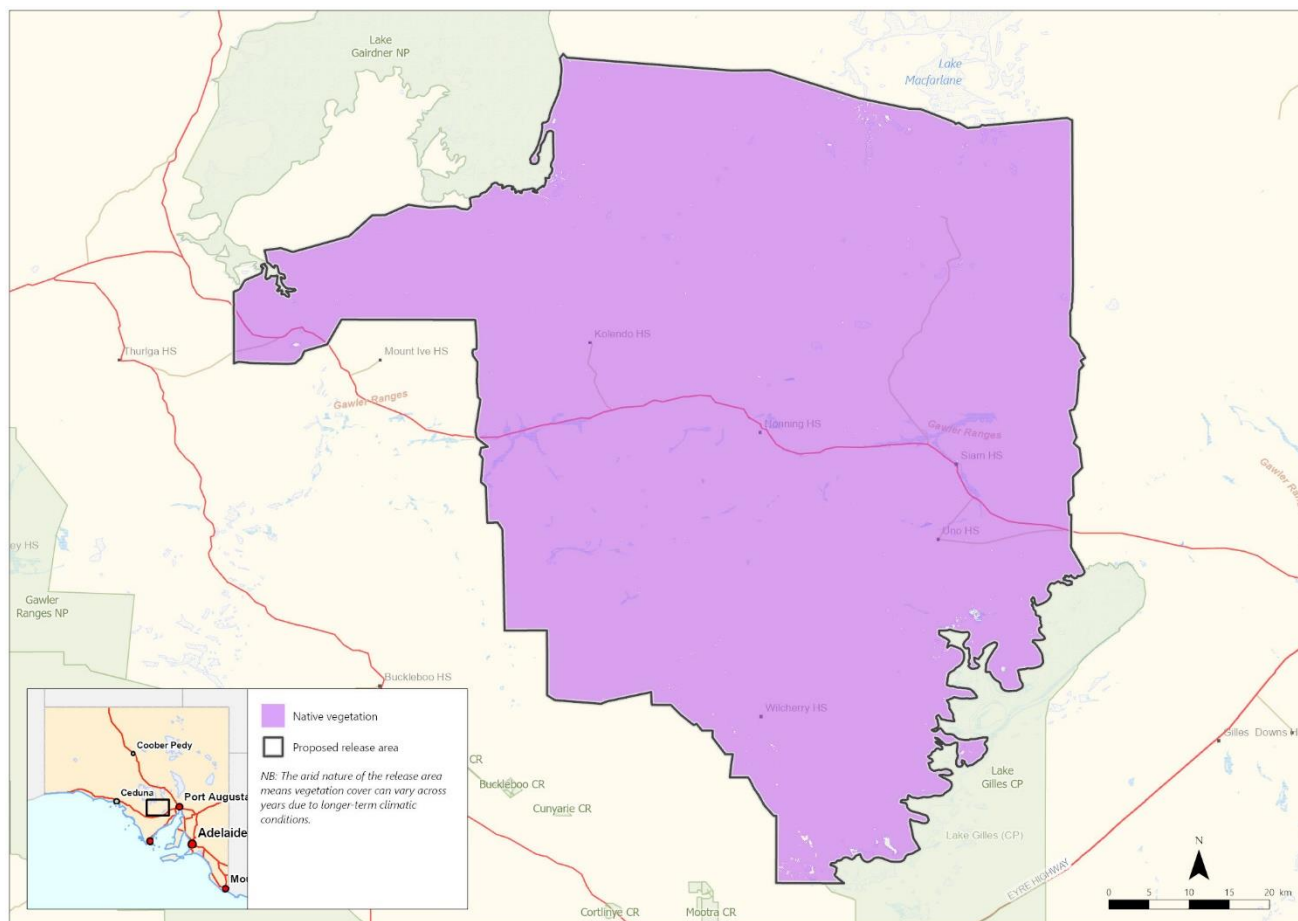


Figure 1: Native vegetation occurrence in the Gawler Ranges East proposed release area (view full size map [here](#)).

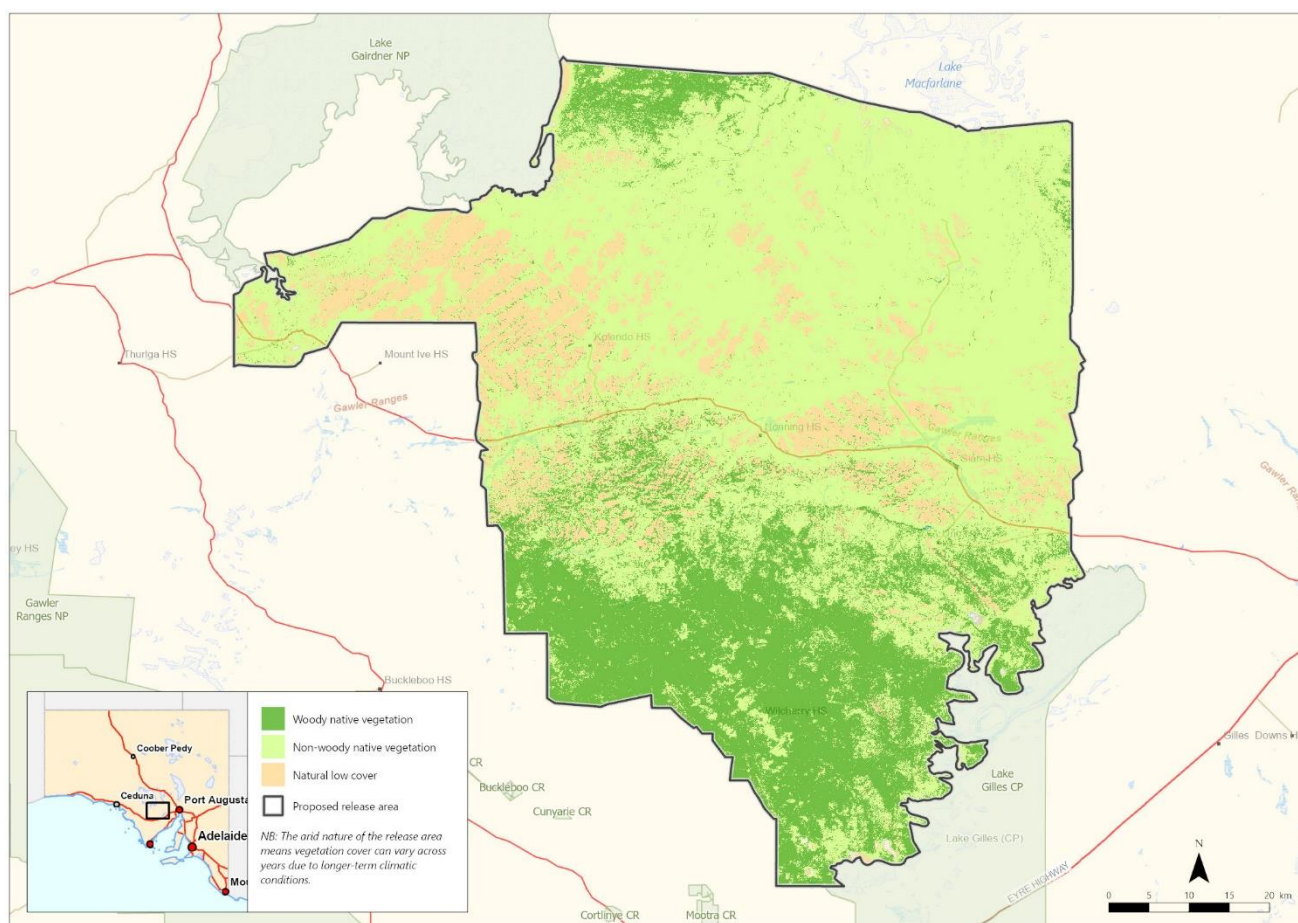


Figure 2: Native vegetation classes in the Gawler Ranges East proposed release area (view full size map [here](#)).

Landscape outputs: interpretation considerations

These maps show the occurrence of native vegetation within the Gawler Ranges East proposed release area.

- These maps and the modelled outputs generated by DEW (September 2024 version) are for informational purposes only. They do not constitute a legal interpretation under relevant legislation.
- The arid nature of the Gawler Ranges East proposed release area means vegetation cover can vary across years due to longer-term climatic conditions.
- All matters in the Gawler Ranges East proposed release area require approvals under relevant legislation, including the Native Vegetation Act and the HRE Act.

Ecosystem outputs

Within South Australia, there is no formal process for the listing of threatened ecological communities under current state legislation. However, it is possible to list threatened ecological communities within the state under the EPBC Act.

Within the Gawler Ranges East proposed release area, no EPBC Act listed threatened ecological communities were found to occur, so no ecosystem outputs have been provided.

Species outputs

Species can be listed as threatened at both the state (NPW Act) and Commonwealth (EPBC Act) levels, with both occurring within the Gawler Ranges East proposed release area. In addition, both Acts enable species to be listed at the species (binomial) or subspecies (trinomial) levels.

DEW undertook a process to determine all the listed species likely to occur within the Gawler Ranges East proposed release area and map their likely modelled distribution. This process involved:

- collating and cleaning all available data from existing biological data repositories, including over 29 million species records accessed from:
 - Global Biodiversity Information Facility (GBIF) and Atlas of Living Australia (ALA)
 - Biological Databases of South Australia (BDBSA)
 - Australia's Terrestrial Ecosystem Research Network (TERN)
 - a number of smaller project-specific datasets
- consolidating the records under a common taxonomy using the ALA taxonomic backbone
- identifying those species that are listed as threatened under either the state or national legislation.
- determining threatened species likely to occur within the Gawler Ranges East proposed release area on the basis that:
 - they have presences within the Gawler Ranges East proposed release area.
 - a minimum convex polygon drawn around their presences intersects the Gawler Ranges East proposed release area (buffered by 50 kilometres)
 - an existing modelled or expert distribution layer intersects the Gawler Ranges East proposed release area.
- generating spatial distribution models at 90-metre resolution using a balanced Random Forest methodology (to account for sampling imbalance) that brought together:
 - species inputs: spatially accurate species presence data from the last 50 years
 - potential explanatory inputs: including climatic and environmental layers as well as satellite imagery.
- generating coarser habitat association outputs for species with insufficient data to generate a spatial distribution model by intersecting presences with relevant landscape units.
- where species have been listed as threatened at a subspecies level rather than a species level, a process then determined the most likely subspecies attribution based upon the prevalence of different subspecies within the Gawler Ranges East proposed release area.
- excluding species that had no recorded presences within the Gawler Ranges East proposed release area, and species with spatial distribution or habitat model that did not intersect the Gawler Ranges East proposed release area.

The outputs resulting from this process include:

- GIS datasets for the resulting 138 individual species likely to occur within the Gawler Ranges East proposed release area.
- summary GIS datasets that overlay the spatial outputs for each species and present this against the relevant Acts, creating:
 - a GIS dataset for the likely occurrence of any EPBC Act listed species (Figure 3, Figure 4)
 - a GIS dataset for the likely occurrence of any NPW Act listed species (Figure 5, Figure 6)
- a summary list of the species identified as likely to occur within the Gawler Ranges East proposed release area, along with their common names (if they have one), the likely subspecies that occur within the Gawler Ranges East proposed release area, their ratings under the EPBC Act and NPW Act, and whether the spatial outputs were based on spatial distribution modelling or habitat associations.

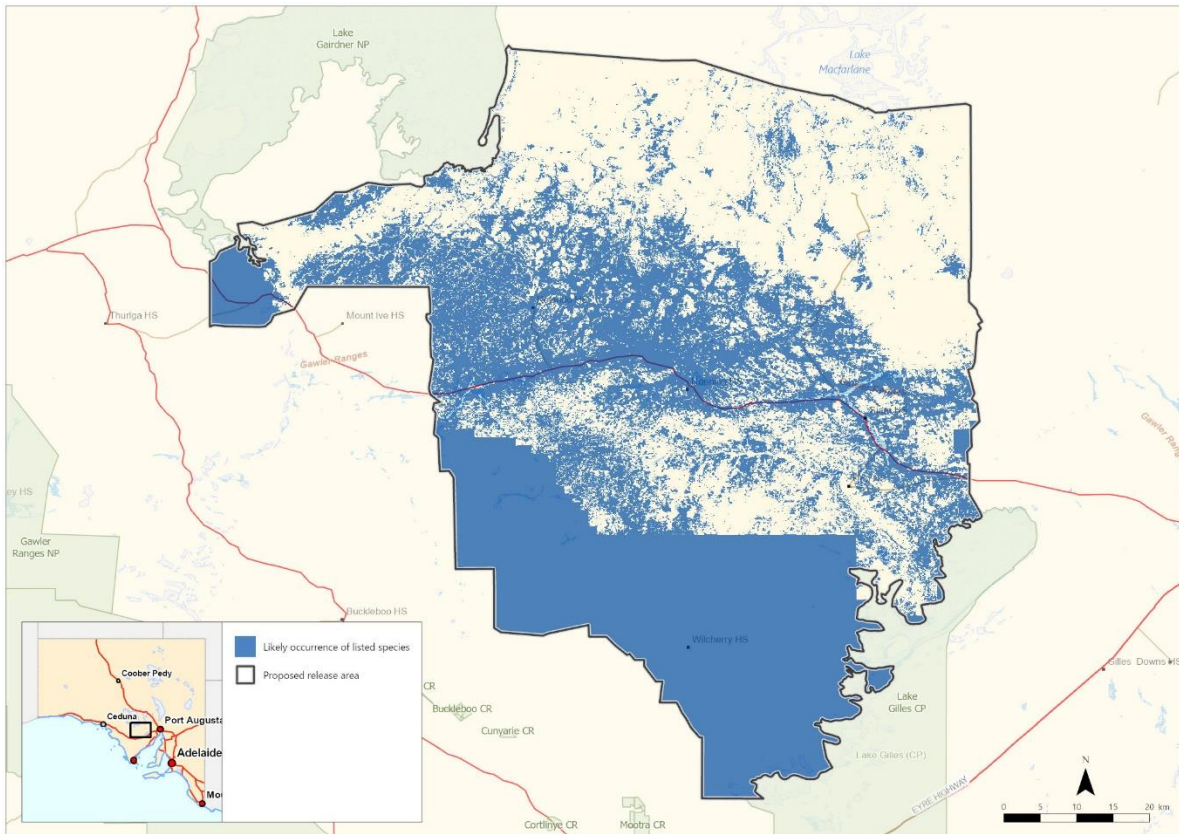


Figure 3: Likely occurrence of EPBC Act listed species in the Gawler Ranges East proposed release area (view full size map [here](#)).

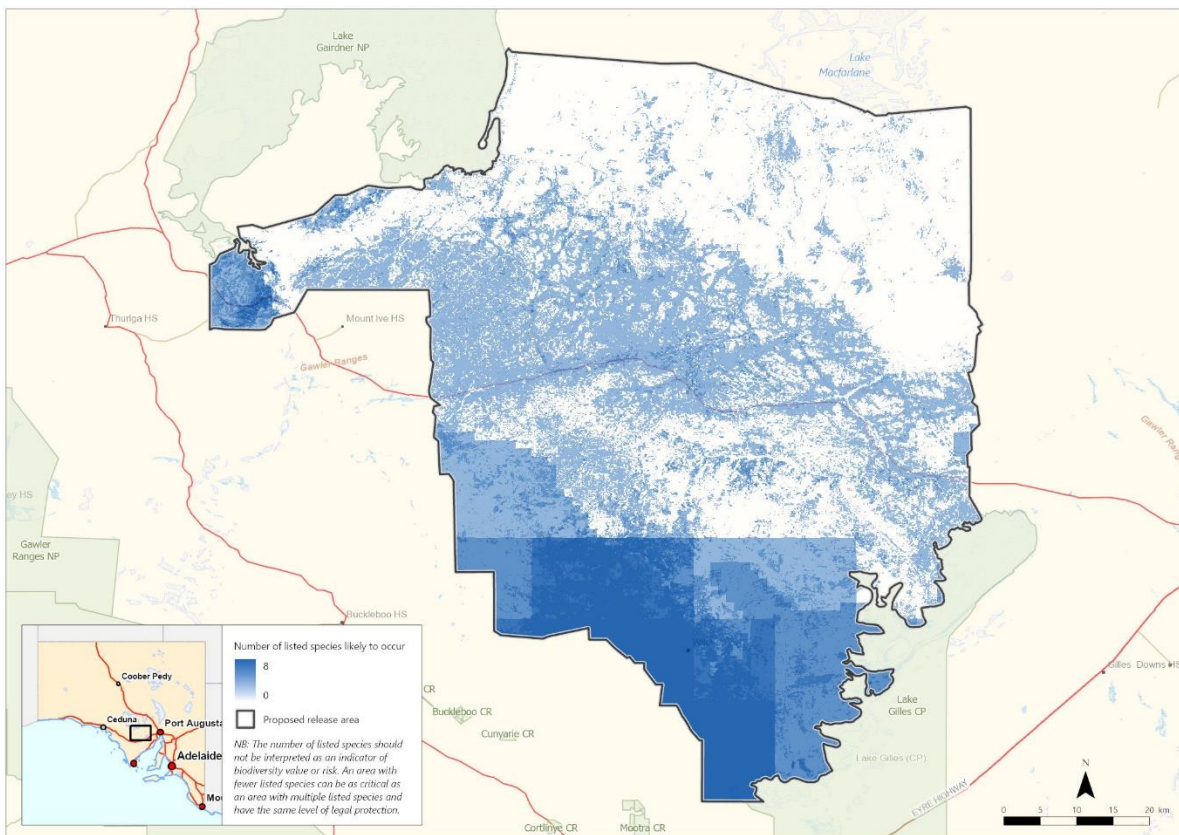


Figure 4: Number of EPBC Act listed species likely to occur in the Gawler Ranges East proposed release area (view full size map [here](#)).

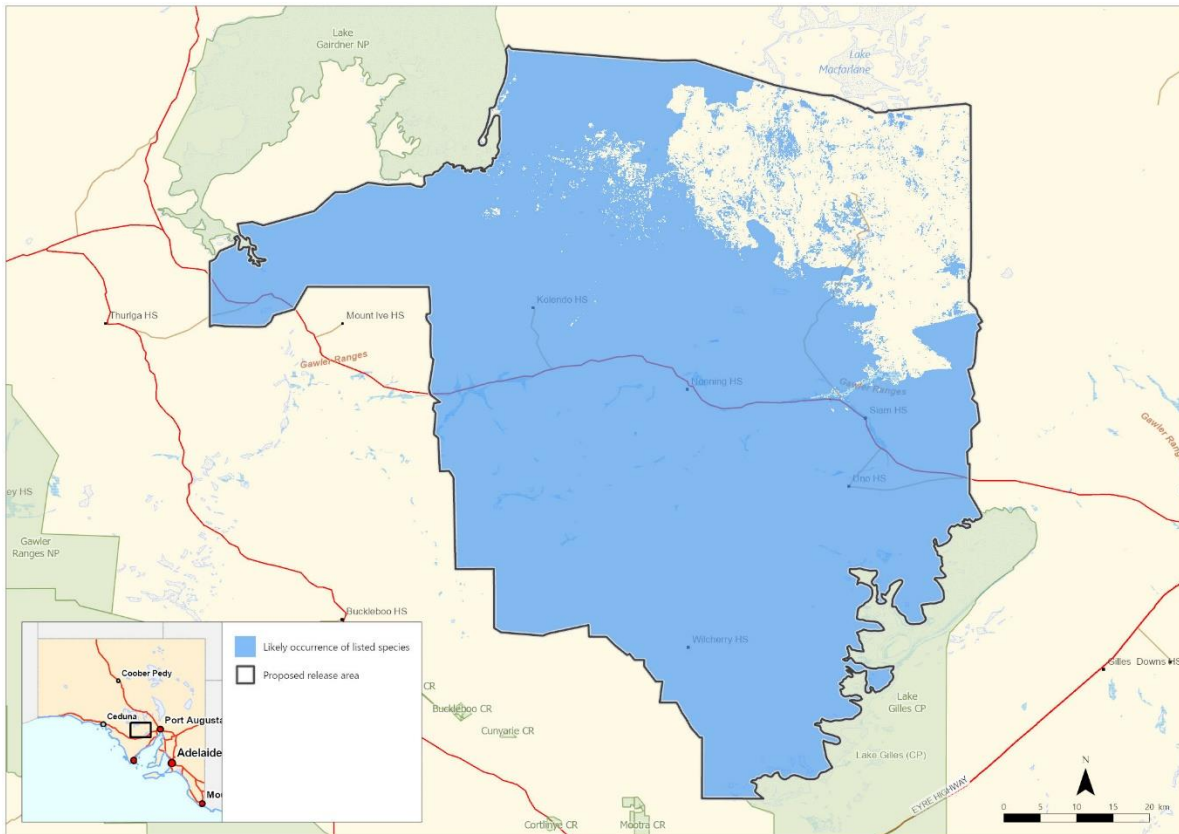


Figure 5: Likely occurrence of NPW Act listed species in the Gawler Ranges East proposed release area (view full size map [here](#)).

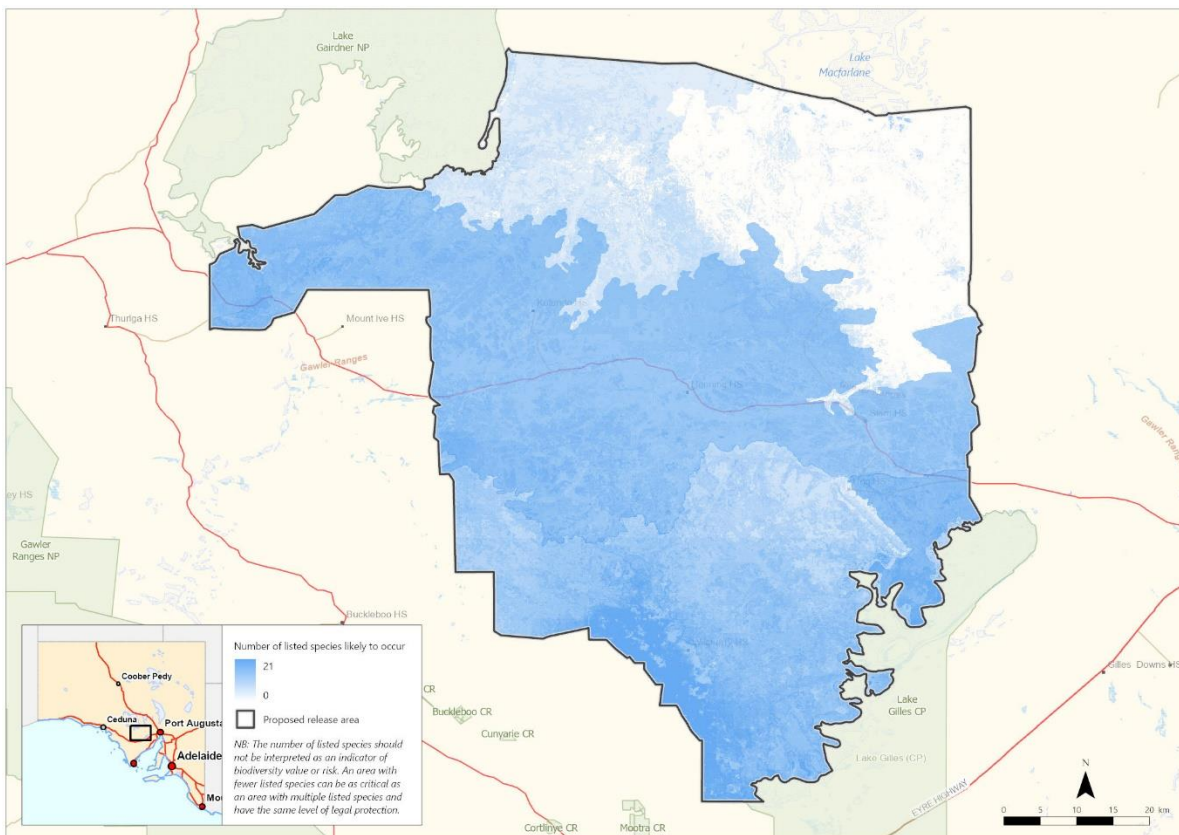


Figure 6: Number of NPW Act listed species likely to occur in the Gawler Ranges East proposed release area (view full size map [here](#)).

Species outputs: interpretation considerations

These maps show the likely occurrence of species listed under the EPBC Act and NPW Act within the Gawler Ranges East proposed release area. Note:

- These maps and the modelled outputs generated by DEW (September 2024) are for informational purposes only. They do not constitute a legal interpretation under relevant legislation.
- All matters in the Gawler Ranges East proposed release area require approvals under relevant legislation, including the EPBC Act, NPW Act and the HRE Act.
- The number of listed species should not be interpreted as an indicator of biodiversity value or risk. An area with fewer listed species can be as critical as an area with multiple listed species and have the same level of legal protection.
- The number of listed species likely to occur was calculated from spatial distribution models, or habitat association models (where there was insufficient data for a distribution model), generated for each species.

Non-listed species inclusions

DEW's September 2024 mapping outputs also include:

- Species assessed as threatened against the International Union for Conservation of Nature (IUCN) Red List criteria but not yet gazetted under legislation.
- Non-threatened species with a large proportion of their distribution within the proposed release area.

Spatial outputs

Existing biological data within the Gawler Ranges East proposed release area is sparse, resulting in some species (approximately twenty-two percent) with insufficient data for spatial distribution modelling, necessitating the use of coarser approaches. These include the use of existing species distribution grid models (available for EPBC Act threatened species) or habitat association approaches.

Data limitations and opportunities

Existing outputs can be used to help developers avoid known areas of significance to listed or at-risk species, as well as target survey methods and timing for species likely to occur as part of their detailed project designs and impact mitigation measures. However, there are likely to be species that occur within the Gawler Ranges East proposed release area that have no presence data. New data collected as part of development planning will fill knowledge gaps and improve future iterations of these outputs.

Taxonomy issues

Taxonomy is continuously changing. The multiple data sources used for this work have inconsistent taxonomic nomenclature.

The ALA taxonomic backbone was used as a time-efficient means of aligning inconsistent taxonomies but there may be unresolved issues.

The scientific names in these outputs reflect the taxonomy recognised by ALA, which may not always be consistent with the original state or Commonwealth listing names.

Future DEW biodiversity values mapping outputs

Future outputs and iterations of DEW's biodiversity values mapping will be generated periodically to incorporate new data, for example, from ground surveys, to support subsequent stages of DEM's release area process.

Further information

A technical report on DEW's mapping of legislated biodiversity values and further information will be made available to support subsequent stages of DEM's release area process to support sustainable renewable energy development under the HRE Act.

DEW provides evidence-based biodiversity data to support strategic planning and environmental impact assessments, ensuring compliance with state and Commonwealth environmental legislation to support sustainable development.

For more information, please contact DEW at DEW.Science@sa.gov.au or visit www.environment.sa.gov.au.

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Telephone +61 (8) 8204 1910

ABN 36702093234

Report prepared by:
Department for Environment and Water
Science and Information Branch
Strategy Science and Corporate Services Directorate
Contact DEW.Science@sa.gov.au

www.environment.sa.gov.au



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