



We acknowledge the First Nations peoples as the Traditional Owners and Custodians of the lands, waterways and skies of the Murray-Darling Basin. We respect their continuing connection to culture and Country, and we thank them for their knowledge and science and the values reflected in these data.

## Flow-MER research - MARXAN Identification of refuge habitat in the Murray-Darling Basin

Dataset name	MARXAN Identification of refuge habitat in the Murray-Darling Basin		
Dataset citation	CEWH (2025) MARXAN Identification of refuge habitat in the Murray-Darling Basin. Flow-MER Program. Commonwealth Environmental Water Holder, Australian Government Department of Climate Change, Energy, the Environment and Water. Sourced from <a href="https://data.gov.au/data/dataset/flow-mer-research-marxan-refuge-habitat">https://data.gov.au/data/dataset/flow-mer-research-marxan-refuge-habitat</a> on [date-sourced].		
Description	<p>The Flow-MER research project <i>identification and characterisation of refuge habitat research project</i> applied systematic conservation planning using MARXAN to identify wetlands in the Murray Darling Basin (MDB ) that may act as climate refugia. Refuge habitats were identified as wetlands with the least deviation in water levels, that were the most feasible to manage and could supported target species, ecosystems and functions. MARXAN uses a simulated annealing algorithm to identify a set of planning units that maximises the representation of ecological asset, while aiming to capture a defined target for each asset and minimise 'cost'. The 'cost' of a planning unit was weighted by its capacity to act as a refuge (dryness anomaly), catchment condition and connectivity (River Disturbance Index) and management feasibility (previous environmental water delivery).</p> <p>The two data tables join to the <a href="#">Australian National Aquatic Ecosystems (ANAE) v3.0 Classification of the Murray-Darling Basin (2021)</a> using the mapped wetland polygon UID attribute.</p> <ol style="list-style-type: none"> <li>1. <b>marxan_cost_managable_floodplain.csv</b> contains MARXAN cost values and final solution set for all lakes and palustrine wetland within scope for water management (on the managed floodplain) in the MDB.</li> <li>2. <b>marxan_cost_wetlands_water_mgmnt_2014-2020.csv</b> contains the MARXAN attributes and solution for the subset of wetlands that have previously received Commonwealth environmental water during the 6 year period 2014-2020.</li> </ol> <p>The CEWH's Flow-MER program examines the contribution of Commonwealth environmental water to the environmental objectives of the Basin Plan 2012 (Basin Plan) and is assisting the CEWH to demonstrate environmental outcomes and adaptively manage the water holdings.</p> <p>Wetlands and lakes are refuges for plants and animals during droughts and other hard times. Maintaining refugia in the Murray–Darling Basin is a key objective of Commonwealth environmental water management.</p>		
Currency	<b>Date from:</b> 1/7/2014 <b>Date to:</b> 1/7/2020		
Spatial domain	<b>Jurisdiction/Location:</b> Murray-Darling Basin		
	<b>Geographic extent:</b> <div style="text-align: center;"> </div>		
	<b>Coordinate system:</b> GDA1994, EPSG 4283		
Dataset status	<b>Progress:</b> Complete		
	<b>Maintenance and update frequency:</b> Research project outputs. No updates planned		
Data attributes	Attribute Name	Description	Data Type

	UID	Unique identifier (9 character geohash) to joins to the ANAE mapping of the Murray-Darling Basin v3	text
	SystemType	System type (Palustrine or Lacustrine)	text
	ANAE_Type	ANAE ecosystem type	text
	Area_Ha	Area of the wetland in Hectares	number
	RDI	River Disturbance Index - estimate of the extent and intensity of anthropogenic disturbances in a river catchment e.g. land-use and infrastructure such as roads and flow-regime disturbance due to impoundments, flow diversions and levee banks	number
	AveDev2017_19	dryness anomaly for each planning unit as the median increase in bare soil for the period 2017 until 2019 compared to the median bare soil in satellite records (1986-2022)	number
	freq6y	Count of number of years that environmental water was used during the 6 year period July 2014to June 2020	number
	dryness_cost	Standardised derived dryness cost index	number
	RDI_cost	Standardised river disturbance index cost	number
	refugia_cost	Standardised refugia cost	number
	managed_cost	Standardised management cost	number
	all_costs	Aggregate cost	number
	Solution	MARXAN solution. value 1 = planning unit selected by MARXAN as optimal cost conservation target. value 0 = not selected.	number
Data quality	<p><b>Lineage:</b> Refer research report for detailed method. Reference in description.</p> <p><b>Positional accuracy:</b> Cost metrics were calculated in GIS from spatial data sets with 25m resolution and polygon data sets with nominal accuracy &lt;250m</p> <p><b>Attribute accuracy:</b> Attributes generated from rasters surfaces in GIS and standardised prior to use</p> <p><b>Logical consistency:</b> Planning units are mapped by the <a href="#">Australian National Aquatic Ecosystems (ANAE) v3.0 Classification of the Murray-Darling Basin</a> as polygon features in GIS. Data tables link derived attributes to a selection of wetlands located on the <a href="#">mapped extent of the managed floodplain</a> using the UID unique identifier.</p> <p><b>Completeness:</b> Data set is complete</p>		
Access and License	<p><b>Published Data Landing Page:</b> <a href="https://data.gov.au/data/dataset/9ce97171-1456-43dc-ab67-438155dee18e">https://data.gov.au/data/dataset/9ce97171-1456-43dc-ab67-438155dee18e</a></p> <p><b>Distribution format:</b> CSV tabular data (zipped)</p> <p><b>Access constraints:</b> Creative Commons license CC BY-SA 4.0 Attribution-ShareAlike 4.0 International). <a href="https://creativecommons.org/licenses/by-sa/4.0/">https://creativecommons.org/licenses/by-sa/4.0/</a> Attribution — You must give appropriate credit, provide a link to the license, and indicate if changes were made. You may do so in any reasonable manner, but not in any way that suggests the licensor endorses you or your use. ShareAlike — If you remix, transform, or build upon the material, you must distribute your contributions under the same license as the original. redistribute the material in any medium or format must give appropriate credit, provide a link to the license, and indicate if changes were made. You may do so in any reasonable manner, but not in any way that suggests the licensor endorses you or your use.</p> <p><b>Copyright:</b> © Commonwealth of Australia, Flow-MER program</p>		
Project Report	Bennett J M, Brooks S, Bush A, Hitchcock J, Linke S (2023) Identifying and characterising refugia habitat for target organisms across the Murray–Darling Basin. Commonwealth Environmental Water Holder’s Science Program: Flow Monitoring, Evaluation and		

	<p>Research (Flow-MER). Department of Climate Change, Energy, the Environment and Water, Australia. 3pp.</p> <p>Flow-MER acknowledges the First Nations peoples as the Traditional Owners and Custodians of the lands, waterways and skies of the Murray-Darling Basin. We thank them for their knowledge and science and respect their continuing connection to culture and Country and the values reflected in these data.</p>
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Metadata information	<b>Metadata date:</b> 28/02/2025