

Geoconservation Subjectivity Evaluation: A Case Study of a Management Toolkit

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Supplementary material

Figure S1 – S6; Tables S1 – S4

Table S1. Definitions of ranking criteria implemented in the subjectivity evaluation tool.

Subjectivity criteria	Ranking Values
Criteria 1: Availability of resources (literature/reports/data) from database search relating to geosite(s) assessed	1 = Extensive resources available specific to geosite(s) in question. For example, multiple relevant articles relevant to geosite in question, multiple government reports, and extensive geological data available (e.g., geological maps or inventories of geoconservation value). 2 = Resources available specific to geosite(s) in question. Some relevant literature, including reports, and available geological data. 3 = Fewer available resources. No ‘recent’ scholarly literature from last 10 years, some government reports, and geological data still available. 4 = Very limited resources with at least one of the following examples: Older scholarly literature up to 20 or more years old, an older government report, or some geological data (e.g., older geological map not regularly updated). 5 = No relevant resources available to support geosite study.
Criteria 2: Relevance of available literature to geoconservation values of the site.	1 = Extensive list (5 – 10 or more) of relevant scholarly literature specific to the geosite values in question. For example, extensive geodiversity and geological literature available for high scientific value site. 2 = List (0 – 5 articles) of relevant scholarly literature specific to the geosite values in question. 3 = Some relevance in the literature available. For example, aboriginal heritage studies in the vicinity of a high educational value site. 4 = Few relevant scholarly articles (industry assessments, database or reports) of relevance to the geosite values in question. 5 = No relevant scholarly literature relevant to the geosite values in question. For example, this would be the first geoconservation or geodiversity study at the site.

Criteria 3: Expertise and experience of scholars	1 = Highly relevant expertise (e.g., geologist, physical geographer with relevant PhD) implementing geoconservation strategy or geodiversity assessment. Experience of more than five relevant publications. 2 = Significant relevant expertise (e.g., geologist, physical geography with relevant PhD) implementing geoconservation strategy or geodiversity assessment. Experience of up to three relevant publications. 3 = Relevant expertise (e.g., geologist, physical geographer with relevant Honours or Masters) implementing geoconservation strategy or geodiversity assessment. Experience of up to one relevant publication. 4 = Some expertise (e.g., geological, physical geography with Honours/Masters/ PhD with some relevance) implementing geoconservation strategy or geodiversity assessment. No relevant publication experience, minor contribution to reports. 5 = Limited expertise (e.g., student in geology, physical geography without assistance from expert in the field, or citizen scientist). No relevant publication experience (scholarly literature or reports).
Criteria 4: Measure of interdisciplinary engagement (author engagement)	1 = Comprehensive author list from various disciplines (more than five) to contribute to all aspects of geoconservation/geodiversity (geology, physical geography, geomorphology, soil science, human geography, and ecologist). 2 = Author list with representatives from up to four separate and relevant disciplines to geoconservation or geodiversity assessment (geology, physical geography, soil science, etc). 3 = Author list with three authors from two separate respective disciplines with some relevance to geoconservation or geodiversity assessment (geology, physical geography soil science, etc). 4 = Author list with two authors with some relevance to geoconservation or geodiversity assessment (geology, physical geography soil science, etc). Authors could have same or different areas of expertise. 5 = Author list with only one author with some relevance to geoconservation or geodiversity assessment (geology, physical geography soil science, etc).
Criteria 5: Subjectivity or objectivity of methods used	1 = Highly objective and quantitative method used to assess geodiversity (remote sensing/GIS technique used to quantify geodiversity) and statistical validation or similar for geoconservation criteria. 2 = Highly objective and quantitative method used to assess geodiversity (remote sensing/GIS technique used to quantify geodiversity) and statistical validation or similar for geoconservation criteria. However, one or two examples of subjectivity in method (e.g., weighting of criteria in indices). 3 = Qualitative-quantitative approach adopted with some subjectivity (such as direct fieldwork opening interpretation to estimating georichness) and ranking approaches adopted for geoconservation criteria. 4 = Qualitative approach (ranking method) used to determine both geodiversity and geoconservation value, with high degree of subjective judgements in the method but some objectivity evident. 5 = Qualitative approach (ranking method) used to determine both geodiversity and geoconservation value, with evidence of very high subjective judgements on value.

Criteria 6: Evidence of attempts made to remove subjectivity from assessments	1 = Obvious attempts to remove subjectivity from assessments (such as expert review of criteria weights through AHP methods and statistical validation techniques). 2 = Attempt made to remove subjectivity from assessments, such as adoption of a statistical validation technique or similar (no expert review). 3 = Some minor attempts made to remove subjectivity from assessments (such as highly specific criteria statements in ranking assessments). 4 = No attempts made to remove subjectivity, but method inherently has some objectivity. Some vague ranking criteria (e.g., “very high geodiversity”). 5 = No attempts made to remove subjectivity, resulting in a highly subjective approach in geoconservation strategy and geodiversity assessment.
Criteria 7: Nature of inferences from subjective assessments	1 = Based on the methodological approaches adopted and availability of data, very strong inferences can be made about geoconservation or geodiversity at the geosite in question. Subsequent research and validation by experts would not necessarily be required to have confidence in the inferences made about geoconservation or geodiversity value. 2 = Relatively strong inferences can be made about the geoconservation or geodiversity value. Subsequent research suggested would be related to methodological development rather than encouragement to validate geoconservation of geodiversity values found. 3 = Moderate inferences made with some degree of confidence, but the lack of available data and subjectivity methodology (C1 – C6), means that only moderate confidence can be had in any conclusions. Therefore, subsequent studies would be recommended at the geosite in question. 4 = Low level of confidence in the data (highly subjective method with limited substantiative evidence) acquired means that only weak inferences can be made about the data. Article would emphasise the need for subsequent validation of data from experts and further development of methodological approaches. 5 = Very low confidence in the results means that no formal inferences can be made about geoconservation or geodiversity value. Would need to explicitly state the need for validation by experts, including implementation of a revised and perhaps more objective methodological approach.

Table S2. The methodological steps adopted to acquire the substantive data needed to justify criteria rankings in the subjectivity evaluation tool.

Criteria	Justification data for ranking value
Criteria 1 and 2 Methodological steps to rank criteria and associated data	Step 1: Google scholar search query: “Dial Range Residual Ridges” OR “Dial Range” OR “northwest coast of Tasmania” AND “geoconservation” OR “geodiversity” OR “geological conservation” OR “geological diversity”.
	Step 2: Google Scholar search results: • Dixon and Duhig (1996) Report to Tasmanian RFA and Environment and Heritage Technical Committee, ‘Compilation and assessment of some places of geoconservation significance’ • Dixon (1995) report for the Parks and Wildlife Service, Tasmania and the Australian Heritage Commission, ‘Aspects of Geoconservation in Tasmania’ • Sharples (1997) report to Australian Heritage Commission and Tasmanian Conservation Trust, ‘Karst Geomorphology and Values of the Tarkine’ • Special publication by Geological Society of Australia (2014), ‘Geological Evolution of Tasmania’
	Step 3: General Google search terms: Search 1: “Dial Range Residual Ridges geoconservation”; Search 2: “Geological features Dial Range Tasmania”; Search 3: “Dial Range Residual Ridges geological significance”; Search 4: “Conservation Dial Range Residual Ridges”; Search 5: “Geological history of Dial Range Tasmania”.
	Step 4: Google search results: • Draft State of Tasmania (2021) Recreation Management Plan for Dial Range Reserve. https://parks.tas.gov.au/Documents/Draft%20-%20Dial%20Range%20Recreation%20Management%20Plan.pdf • Two other reports returned in the search without direct relevance to Dial Range Residual Ridges site, such as Tasmanian Regional Forest Agreements and Special Timbers Resource Assessments from the Department of Natural Resources and Environment Tasmania
	Step 5: Search for key terms in each resource to assess relevance in Criteria 2 (CTRL+F): Dial Range; Dial Range Residual Ridges; Geoconservation; Geoheritage; Geodiversity; Geological Features; Conservation; Geosite
	Justification for Criterion 1 rank of 3: One recent resource found with many over 20 years old. Geological Society of Australia 2014 geological data for site. Therefore, resources aren’t very limited (rank 4) or non-existent (rank 5). Overall value of 3 assigned for Criterion 1; not abundant (rank 1 or 2).
	Justification for Criterion 2 rank of 4: Of the resources found, most were not site-specific. For example, no mention of Dial Range in the Sharples (1997) Karst Geomorphology and Values for the Tarkine report. In recent Dial Range recreational report, there was no mention of geoconservation, geoheritage, or specifics in

Criteria 3	Methodological steps to rank criteria and associated data	Highest qualification and relevance of degree (first author):	PhD (physical geography; geodiversity/geoconservation)
		Step 2: Highest qualification and relevance of degree (second author):	PhD (physical geography; mangrove ecology and conservation)
		Total publications and H-index first author:	5 publicationsh-index of 4
		Total publications and H-index second author:	203 publicationsh index of 36
		Number of geoconservation/geodiversity relevant articles first author:	4
		Number of geoconservation/geodiversity relevant articles second author:	4
		Justification for Criterion 3 rank of 2: Both scholars are PhD holders in physical geography; author 1 with a PhD in geodiversity and geoconservation. However, both authors are not geologists, which is useful knowledge adding some objectivity in geodiversity assessments. Authors have four relevant publications and therefore some relevant experience in this field. Author 2 is an experienced academic, based on academic position and h-index, meaning great familiarity and experience with methodological rigour in scientific publications. Therefore, a rank of 2 was assigned, indicating a low overall subjectivity for this criterion.	
Criteria 4		Number of contributing authors:	2
		Author 1 expertise:	Physical geography; Geoconservation and geodiversity
		Author 2 expertise:	Physical geography; mangrove ecology/conservation
		Relevant areas missing from interdisciplinary engagement:	Geology/Earth Science; soil scientists; GIS and remote sensing experts; cultural heritage experts; geotourism experts; advice from local community representatives
		Justification for Criterion 4 rank of 4: Only two authors with similar areas of expertise having contributed to four current geodiversity/geoconservation publications. A number of experts from other relevant areas could have been engaged to help facilitate objective decision making, such as geology or cultural heritage experts. Therefore, a rank of 4 was allocated.	
Criterion 5		Geodiversity assessment:	Required counting individual geological features. Therefore, subjectivity likely during interpretation of different geological features.
		Geoconservation strategy:	Required ranking geoconservation criteria with limited literature/background knowledge of an area, and without experts such as cultural or geotourism professionals. Therefore, subjectivity arose in assigning criteria ranks.
		Justification for Criterion 5 rank of 4: Counting geological features and ranking geoconservation criteria added elements of subjectivity to the methods. Therefore, a rank of 4 was assigned to Criterion 5.	

Criterion 6	Methodological steps to rank criteria and associated data	Geodiversity assessment:		Geological map (Fig S1) informed some aspects of counting various geological features, though the overall assessment approach required individual judgement on various features at Dial Range
		Geoconservation strategy:		No methodological approach implemented to add objectivity, all criteria required individual judgement to assign a rank.
		Justification for Criterion 6 rank of 4: No specific methodological approach implemented to reduce subjectivity in geoconservation strategy criteria. The geological map added some objectivity in the geodiversity assessment step, but still required individual judgement in counting of geodiversity features. Therefore, a rank of 4 was allocated to Criterion 6.		
Expert judgement:		Significant expert judgement was required in the geodiversity and geoconservation assessment component of the study.		
Lack of data:		Data was limited, particularly for geoconservation value in the region. Limited publications substantiating findings or research objectives. This lack of information/data influenced strength of inferences.		
Nature of inferences:		Inferences indicating the need for subsequent research: “The results of this study indicate indicate that the assessment of geoconservation and geodiversity values at DRRR is highly influenced by subjective factors (Fig 6), and further research is needed for data validation and substantiation (Fig 6).”		
Inferences missing:		Strong substantiated inferences, such as “This site contains the only exposed section of XYZ rock formation in the region”.		
Criterion 7		Justification for Criterion 7 rank of 4: Data acquired with limited substantive evidence due to absence of relevant literature/data and subjective methodological approaches. Recommended subsequent validation of data by experts and implementation of more objective approaches at the geosite in question.		

Table S3. Age and description of geological elements in the Dial Range geoconservation site with associated symbols as they relate to the Figure 1B geological map.

Symbol	Age (mya)	Description
COcd	485.4 - 494	Pebble-cobble siliciclastic conglomerate and coarse-grained sandstone with abundant quartzite and chert clasts (Duncan Conglomerate).
Ccwc	510 - 536	Pale to dark grey or black, distinctly bedded and plane laminate to massive or brecciated chert with minor red and grey siliceous hematitic mudstone and siltstone (Barrington Chert and correlates). Part of Luina Group and correlates.
Cdaid	494.2 – 496.2	Massive plagioclase - hornblende phyric dioritic, andesitic and dacitic intrusives (Lobster Creek Intrusives).
Cdsr	492 – 508	Undifferentiated mainly sedimentary sequence (near Riana) of shale, siltstone, lithicwacke, sandstone and conglomerate, with minor volcanoclastic units and a rare felsic lava.
Cdsrc	492 - 508	Pebble-cobble volcanoclastic conglomerate.
Cdsv	493 – 509	Marine volcano-sedimentary and sedimentary sequences of sandstone, siltstone, mudstone, conglomerate and breccia with some volcanic rocks, felsic to andesitic. Middle Cambrian fossils in places. Western Volcano-Sedimentary Sequences, including Yolande Ri.
Cdsvgs	495 - 498	Coarse-grained polymict conglomerate with clasts of basalt, chert, siltstone and limestone (Sprent Formation) (Cdsvgs).
Osm	458.5 – 477.7	Pale grey to pink, commonly cross-bedded quartz sandstone, coarse and pebbly in places, tubicular trace fossils on some horizons. Ordovician fossils in places. Moina Sandstone and correlates.
Osmc	458.4 – 477.7	Siliciclastic pebble conglomerate.
Qha	0 – 0.0117	Stream alluvium, swamp and marsh deposits.
Qpt	0.0117 – 2.58	Talus, till and scree of probable Pleistocene age.
Qpto	0.0117 – 2.58	Quartz sandstone and conglomerate talus derived from Owen Group correlates.
Tb	8.6 - 70	Basalt.

Table S4. Geoheritage criteria used in the assessments at DRRR.

Criteria name	Ranking category classifications (All criteria ranked from 0 to 4)
Scientific value criteria	
Representativeness	1 = Very low representativeness, 2 = Low representativeness significance at site, such as a highly degraded tessellated pavement not representing a good example of its type, 3 = Moderate representativeness significance at the site, 4 = High representativeness significance at the site, 5 = Exemplary example of representative formations at the site, such as a geological formation being one of the most notable and representative of its type.
Key Locality	1 = Very low-key locality of the site, 2 = Location of geological formations are of low importance, 3 = Moderate local importance of the location of the site, 4 = High regional or state importance of the location, 5 = Very high statewide, national, or global importance of the site's location.
Scientific Knowledge	1 = The site is absent from all scientific literature, 2 = The site has at least one government (EPA article), 3 = Appears in more than one government document/website, 4 = Appears in more than one government document/website, and at least one published article, 5 = Appears extensively in relevant peer-reviewed literature.
Use limitations	1 = Very high and intense use, not permitting any increase in activities for present use, 2 = High use, permitting some increase in activities, 3 = Moderate use, permitting reasonable increase in activities, 4 = Low use, with site unlikely to facilitate expansion of activities (local or regional legislative protection), 5 = Very low use of the site and its geomorphic features, with little to no opportunity or interest in increasing activities at the site (statewide or national protection).
Visibility	1 = The site offers no visibility or acceptable viewpoints for tourists to stand, 2 = The site offers some scenic value to tourists, but is often constricted by obtrusive obstacles, 3 = The site offers moderate scenic value, with few obstacles affecting view 4 = The site offers good scenic value to tourists, particularly with a good viewpoint, 5 = The site offers outstanding scenic value, visibility of features, and provides tourists with a high-quality viewpoint (i.e. viewpoint platform at a specific height)
Ecological interest	1 = Very low influence between geomorphic features and surrounding ecosystems, 2 = Low influence between geomorphic features and surrounding ecosystems, 3 = Moderate influence between geomorphic features and surrounding ecosystems, 4 = High influence between geomorphic features and surrounding ecosystems, 5 = Importance and very high influence between geomorphic features and surrounding ecosystems.
Extensiveness	1 = Site has very limited spatial coverage and does not represent a comprehensive record or variation in geological features; 2 = Site has a somewhat limited spatial coverage but includes some variation in geological features; 3 = The site covers a moderate area, representing a good cross-section of geological features or processes, but may not be comprehensive; 4 = The site has a broad spatial coverage, almost comprehensively representing the geological features or processes of the regions; 5 = The site spans a vast area and comprehensively represents the geological features, processes, and variations present in the large geographical region or landscape.

Interpretation	1 = The site can only be understood, interpreted and studied by experienced scientific researchers (PhDs), 2 = The site can only be understood, interpreted and studied by postgraduate students with earth science or physical geography expertise, 3 = The site can be understood, interpreted and studied by undergraduate Earth Science or geography students, 4 = Can be understood from an Grade 10 to University level audience, 5 = The site can be understood, interpreted and studied by all students from Grade 5/6 through to University level, as well as a non-university / public audience.
Degradation	1 = Very low integrity and has been highly degraded by both natural and anthropogenic influences, 2 = Low integrity, but many aspects have been degraded, 3 = Moderate integrity, with some degradation, 4 = High integrity with one or two areas degraded, 5 = Very high integrity with no degradation.
Quality	1 = The quality and scientific worth of the site is very low, 2 = Low quality, for example the quality of the basalt flow phenomena is inferior to other examples, 3 = The quality of the site is inferior to other similar examples, but overall has reasonably high scientific worth, 4 = The quality of the site and its display of basalt flow phenomena is of a higher standard than other examples; further, the site displays high scientific worth, 5 = The quality of the site is higher than other similar examples across the state and is of very high scientific importance.
Scientific value	1 = The quality and scientific worth of the site is very low, 2 = Low quality, for example the quality of the basalt flow phenomena is inferior to other examples, 3 = The quality of the site is inferior to other similar examples, but overall has reasonably high scientific worth, 4 = The quality of the site and its display of basalt flow phenomena is of a higher standard than other examples; further, the site displays high scientific worth, 5 = The quality of the site is higher than other similar examples across the state and is of very high scientific importance.
Tourism value criteria	
Vulnerability	1 = The site is highly vulnerable to anthropogenic influence (cars, walking, climbing etc.) and frequent visitors would result in its destruction, 2 = The site is vulnerable to all anthropogenic influences if visitation is not controlled, 3 = The site is only moderately vulnerable to anthropogenic influences if some strict measures are put in place, 4 = Site exhibits low vulnerability to any influences, 5 = The site is not at all vulnerable to all anthropogenic influences and further no restrictions on visitation frequency are necessary
Accessibility	1 = Accessibility to the site is not possible without specialised equipment and requires hiking, 2 = Accessibility to the site is difficult, but appropriate footwear is required, 3 = Accessibility to the site is manageable, but some persons may be limited, 4 = Accessibility to the site is mostly good, with rare occurrences of being difficult for some individuals, 5 = Accessibility to the site is easy for all (no specialised equipment required).

Safety	1 = Site has very low safety standards for tourist access (experienced walkers only with supervision required, including advanced equipment to access all features), 2 = Site has low safety standards for tourist access (supervision or equipment would be required to access areas), 3 = Site is moderately safe for tourist access (some supervision or equipment would be required for some areas of the site), 4 = Site is safe for tourist access (no supervision or skills required to access some of the feature). One or two areas are probably less safe without appropriate equipment or supervision, 5 = Site is very safe for tourist access (no supervision or skill required to access all features).
Logistics	1 = Very high logistical complexity (e.g., very low accessibility, site is unsafe for inexperienced walkers or without appropriate equipment, no dedicated footpath with venturing into complex terrain required, and only suitable for highly experienced walkers), 2 = High logistical, 3 = Moderate logistical complexity, 4 = Little logistical complexity, 5 = Very little logistical complexity (e.g., overall high accessibility, extremely safe, dedicated footpath, and suitable for inexperienced walkers).
Proximity to recreational areas	1 = The site is more than 10km from the above areas, 2 = The site is between 5 and 10km from the above areas, 3 = The site is between 3 - 5 km from the above areas, 4 = The site is between 1 – 3 km from the above areas, 5 = The site is less than 2 km from the above areas.
Infrastructure and facilities	1 = The site is more than 10km from the above areas, 2 = The site is between 5 and 10km from the above areas, 3 = The site is between 3 - 5 km from the above areas, 4 = The site is between 1 – 3 km from the above areas, 5 = The site is less than 2 km from the above areas.
Aesthetics	1 = Very low tourism attractiveness rate (e.g., area of little interest to tourists, such as largely unappealing sites with little ‘scenic’ or ‘aesthetic’ reward for the visit), 2 = Low tourism attractiveness rate, 3 = Moderate tourism attractiveness rate, 4 = High tourism attractiveness rate, 5 = Very high tourism attractiveness rate (e.g., site is highly aesthetically pleasing and is a site of very high tourist frequency, such as Himalayas, Uluru, or other similar area of similar popularity).
Viewpoint	1 = The site offers no scenic value to tourists and there is no acceptable viewpoints for tourists to stand, 2 = The site offers some scenic value to tourists, but is often constricted by obtrusive obstacles, 3 = The site offers moderate scenic value, with few obstacles affecting view 4 = The site offers good scenic value to tourists, particularly with a good viewpoint, 5 = The site offers outstanding scenic value and provides tourists with a high-quality viewpoint (i.e. viewpoint platform at a specific height)
Degradation	1 = Very low integrity and has been highly degraded by both natural and anthropogenic influences, 2 = Low integrity, but many aspects have been degraded, 3 = Moderate integrity, with some degradation, 4 = High integrity with one or two areas degraded, 5 = Very high integrity with no degradation.
Proximity to restaurant/hotel	1 = Located very far from site and would require some time to travel in a car (several hours, 200 – 500km), 2 = Located far from site and would require some time to travel in car up to 1 hour or 50 - 100km from services, 3 = Within moderate proximity to restaurants and hotels (within driving distance of 5 – 10km), 4 = Within close proximity to restaurants and hotels (within walking distance, 3 – 5km), 5 = Within in very close proximity to restaurants and hotels (e.g., coastal geoconservation site within 1km of town or city centre, such as within walking distance).

Proximity to urban area	1 = The site is more than 10km from the above areas, 2 = The site is between 5 and 10km from the above areas, 3 = The site is between 2 - 5 km from the above areas, 4 = The site is less than 2 km from the above areas
Proximity to road networks	1 = The site is more than 10km from the above areas, 2 = The site is between 5 and 10km from the above areas, 3 = The site is between 2 - 5 km from the above areas, 4 = The site is less than 2 km from the above areas
Availability of information	1 = Availability of information is limited both at the site and at tourist attraction centres - the discovery of the site is not likely, 2 = Availability of information is mostly limited both at the site and at tourist attraction centres - the discovery of the site is not likely, 3 = Information is available to tourists at the site and at tourist attraction centres, 4 = Extensive information is available at the site for tourists, road signs navigating to the site and information found at tourist centres
Conservation value criteria	
Legislative protection	1 = No legislative protection at the site, 2 = Very few local laws in place to protect the site, 3 = Some local with up to one state law in place to protected the site, 4 = Some aspects of state and federal law may protected this site, 5 = The site has achieved geoconservation status and is protected by one or more state or federal laws
Ecological influence	1 = Very low influence between geomorphic features and surrounding ecosystems, 2 = Low influence between geomorphic features and surrounding ecosystems, 3 = Moderate influence between geomorphic features and surrounding ecosystems, 4 = High influence between geomorphic features and surrounding ecosystems, 5 = Importance and very high influence between geomorphic features and surrounding ecosystems.
Settlement proximity	1 = The site is more than 10km from settlement, 2 = The site is between 5 and 10km from settlement, 3 = The site is between 2 - 5 km from settlement, 4 = The site is less than 2 km from settlement
Level of deterioration/ Degradation	1 = Very low integrity and has been highly degraded by both natural and anthropogenic influences, 2 = Low integrity, but many aspects have been degraded, 3 = Moderate integrity, with some degradation, 4 = High integrity with one or two areas degraded, 5 = Very high integrity with no degradation.
Integrity of intactness	1 = Very low integrity and has been highly degraded by both natural and anthropogenic influences, 2 = Low integrity, but many aspects have been degraded, 3 = Moderate integrity, but some aspects have been degraded, 4 = High integrity with one or two areas degraded from anthropogenic or natural influences, 5 = Very high integrity and has no degradation from both anthropogenic influences and little degradation from erosion or weathering.
Accessibility	1 = Accessibility to the site is not possible without specialised equipment and requires hiking, 2 = Accessibility to the site is difficult, but appropriate footwear is required, 3 = Accessibility to the site is manageable, but some persons may be limited, 4 = Accessibility to the site is mostly good, with rare occurrences of being difficult for some individuals, 5 = Accessibility to the site is easy for all (no specialised equipment required).

Conservation status	1 = Destroyed, 2 = Threatened, 3 = Potentially Threatened, 4 = Unlikely to be threatened, 5 = Least Concern
Present use	1 = Very high and intense use, not permitting any increase in activities for present use, 2 = High use, permitting some increase in activities, 3 = Moderate use, permitting reasonable increase in activities, 4 = Low use, with site unlikely to facilitate expansion of activities (local or regional legislative protection), 5 = Very low use of the site and its geomorphic features, with little to no opportunity or interest in increasing activities at the site (statewide or national protection).

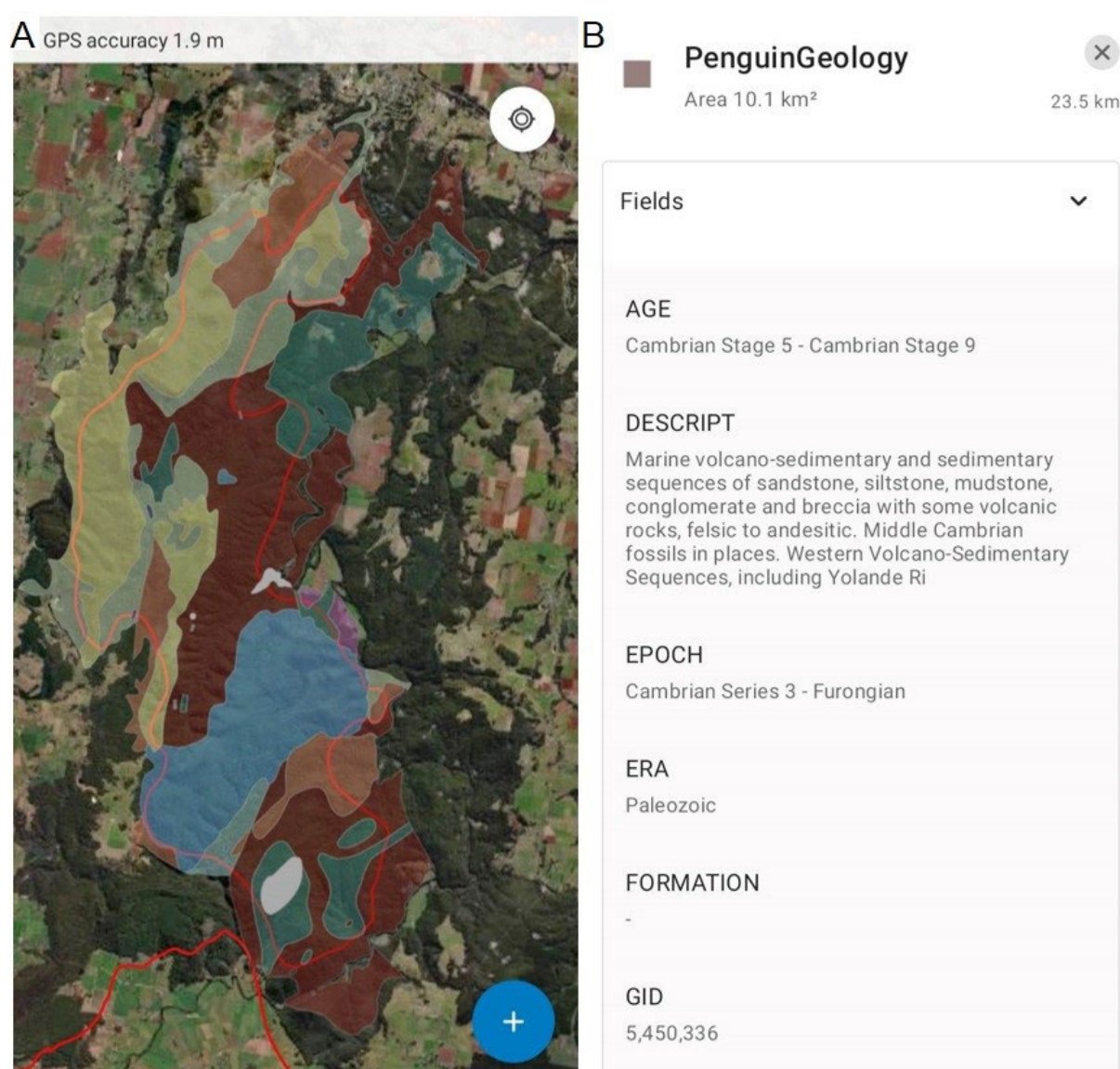


Figure S1. A – Geological map items distribution as they appeared in the field using the FieldMaps app. B – Attributes of each individual geological map items viewable from the field.

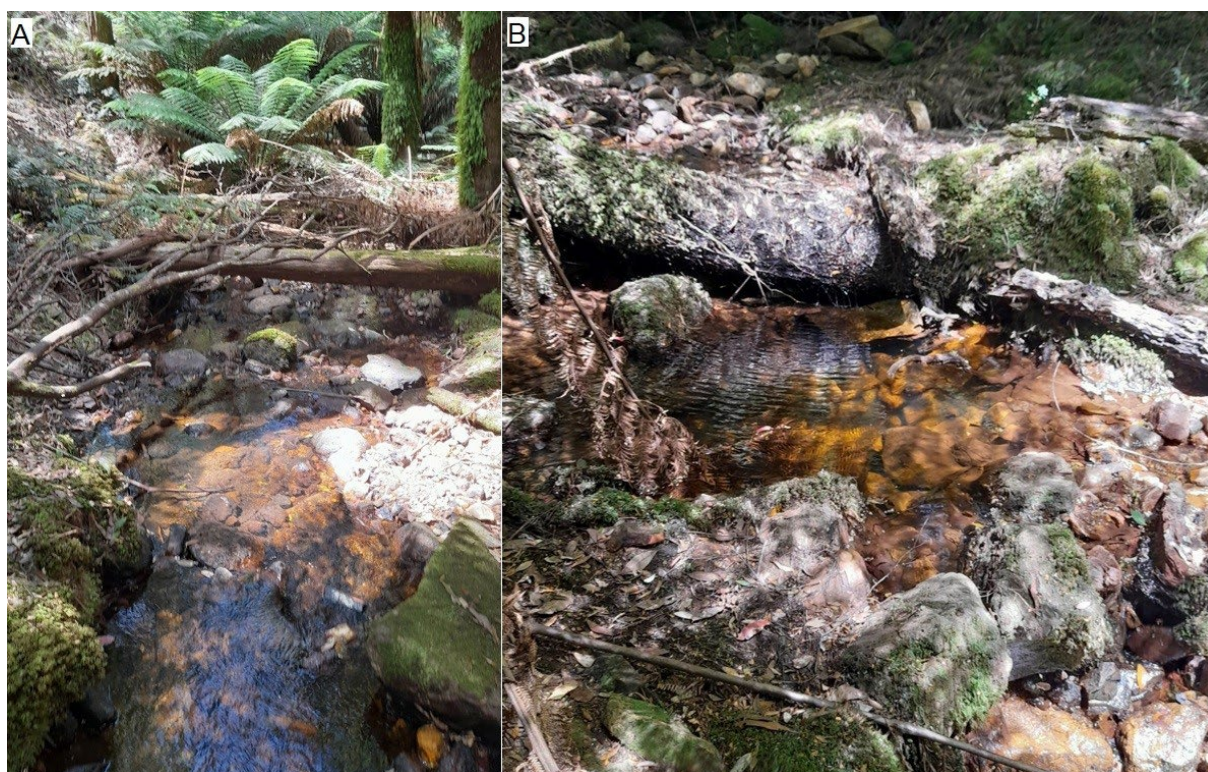


Figure S2. A – Duncan river at the base of Mount Duncan B – Rock pool feature found upstream of the Duncan river at the base of Mount Duncan.



Figure S3. A – Pebble-cobble siliciclastic conglomerates B – Coarse-grained sandstone bedrock.



Figure S4. Planar fracture joints and chert clasts noted in coarse-grained sandstone.

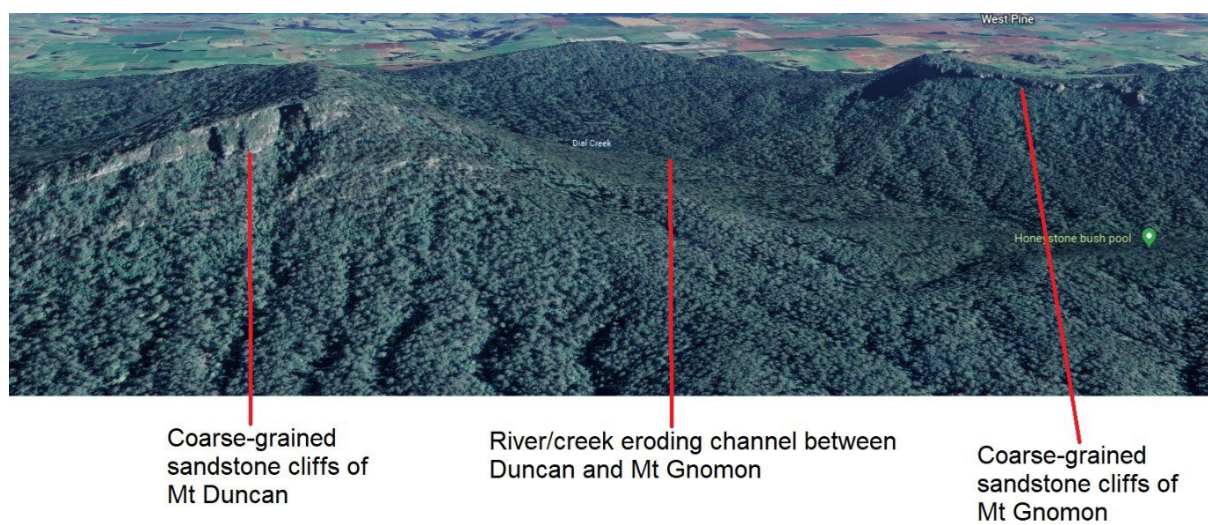


Figure S5. Examples of prominent geomorphic features observed at the Dial Range Residual Ridges geoconservation site, including cliffs from tectonic events and river valleys from fluvial erosion.



Figure S6. A – Pale brown soil observed to be homogenous across DRR B – Shallow rocky soil layers observed around Mounts Duncan, Dial, and Gnomon.