



Division of Mines and Mineral Resources — Report 1990/27

Earth Science Inventory — World Heritage Area

INTRODUCTION

This document contains a list of geological features of particular interest which occur in the Tasmanian Wilderness World Heritage Area. It was prepared by geologists of the Division of Mines and Mineral Resources, Tasmania Department of Resources and Energy, in response to a request from Mr Grant Dixon, Tasmania Department of Parks, Wildlife and Heritage. Mr Dixon employed the terms 'Earth Resources Inventory' in his original request.

Many geologists in the Division of Mines and Mineral Resources were involved in compiling the list of features, with particular contributions from P. W. Baillie, C. R. Calver, J. L. Everard and N. J. Turner. Other contributors were R. S. Bottrill, A. V. Brown, M. J. Clarke, D. McP. Duncan, R. H. Findlay, S. M. Forsyth, G. R. Green, W. L. Matthews, D. B. Seymour, and E. Williams. The classification and scheme of ranking of features are by N. J. Turner, who wrote this report. E. Williams made a particular contribution on matters relating to the data base.

CHARACTER OF THIS LIST

In some contexts the term "earth resource" is taken to mean material of actual or potential value for mining or quarrying. We consider that the term "Earth Science Inventory" has a much wider connotation in the context of the World Heritage Area inventory.

The list in this report simply gives features which a group of geologists with a range of backgrounds find to be of particular scientific, cultural or aesthetic interest.

DATA BASE

Any assessment of geological features of particular interest in any area is dependent on the quality of the data base. Unfortunately the geological data base for the Tasmanian Wilderness World Heritage Area is unsatisfactory. In particular, the published geological maps are inadequate for part of the area in western Tasmania and for a large part of the area in southwestern Tasmania.

Although they provide complete coverage, the Geological Atlas 1:250 000 Series maps are small scale, relatively old,

and were compiled in large part from even older, disjointed, often sketchy, reconnaissance data. Maps of 1:50 000 scale are the accepted standard for the Tasmanian Geological Atlas, as this scale acknowledges our difficult terrain and complicated geology. However less than half of the World Heritage Area is covered by such maps.

We consider that the full coverage of the World Heritage Area by geological maps with a scale of 1:50 000 would provide an adequate data base for reasonably detailed geological assessments. Such a data base would also provide a foundation for the analysis and interpretation of those other phenomena in the World Heritage Area which are subject to geological influences or controls.

PREVIOUS REPORT

The 1979 report on *Geological Monuments in Tasmania*, prepared by the Geological Society of Australia Inc., Tasmania Division, established the status of a range of localities which are now within the World Heritage Area. These localities are:

Collingwood River
– Eclogite.

Darwin Crater and Strewnfield
– Meteoroid crater and associated glass.

Denison Range
– Cambro-Ordovician stratigraphy
– Pleistocene glaciation.

Gordon River and Scotts Peak Roads

(a) Strathgordon
– Highly deformed Precambrian rocks.

(b) Wedge River
– Poorly sorted, deformed conglomerate.

(c) Lake Edgar
– Active fault scarp.

(d) East of Little Florentine River
– Florentine Valley Mudstone – Type section.

**SUMMARY OF GROUP HEADINGS
IN THIS LIST**

- (1) Geological terranes.
- (2) Geological formations and units.
- (3) Geological boundaries.
- (4) Geological phenomena or processes with strong geomorphic expression.
- (5) Minerals.
- (6) Rocks.
- (7) Fossils.

(8) Palaeoglacial feature.

RANKING OF FEATURES

- A1 Unusual in the world.
- A2 Unusual in Australia.
- A3 Unusual in Tasmania.
- B1 Outstanding or striking example of a geological phenomenon.
- B2 Noteworthy example of a geological phenomenon – requires specific reason.
- C Important in terms of human history, particularly early exploration and mining.

LISTING

(1) GEOLOGICAL TERRANES

- (a) *Central Plateau/Western Tiers*: Flat-lying Parmeener Supergroup with virtually continuous dolerite cover over much of it. Mainly dolerite mountains. Example of Pleistocene ice-cap glaciation. A1
- (b) *Upper Mersey River–Mt King William; Mt Picton–Mt La Perouse*: Extensively dissected Parmeener Supergroup/dolerite. A2
- (c) *Frodshams Pass–Battlement Hills*: Folded Palaeozoic siliceous sandstone and conglomerate forming strike-ridge mountains.
- (d) *Tyennan region*: Strongly deformed, Proterozoic metasedimentary rocks of lower greenschist facies (shallow marine origin) and upper greenschist to eclogite facies (uncertain origin). Mainly quartzite mountains.
- (e) *Jubilee region*: Thick succession of folded Proterozoic sedimentary rocks of shallow marine origin. Quartzite and Parmeener/dolerite outliers form mountains.

(2) GEOLOGICAL FORMATIONS AND UNITS

(a)	Adamsfield	Fossiliferous palaeoplacer (Osmiridium) in basal Wurawina Supergroup	A3
(b)	Atkins Range	Banded iron formation	A3
(c)	Adamsfield to Serpentine Creek	Ultramafic-bearing mélangé	A2, B1
(d)	Upper Weld River	Mixtite units in uniform carbonate	B2 (interesting association)
(e)	NE shore, Macquarie Harbour	Channelised flood-plain deposits	B2 (important to geological history)
(f)	Coal Point, Macquarie Harbour	Coal	C
(g)	Mt Sorell – west slope	Facies change indicating Tertiary uplift	B2 (important to geological history)
(h)	Bubbs Hill	Ordovician limestone	B2 (complete section with top and bottom)

(i)	New River–Surprise Bay	Major shear zones in Tyler Creek Beds	B1 (well exposed)
(j)	Clytie Cove and Ironbound Range	Mass-flow deposits in submarine fan sequence	B1
(k)	Precipitous Bluff–New River Lagoon	Gordon Limestone with reefal facies	A3
(l)	Surprise Bay	Ordovician limestone of deep water facies	A3
(m)	South Cape Bay	Triassic coal measures	B2 (very well exposed)
(n)	Various localities in Terranes a, b (above), e.g. Mt La Perouse, Goulds Sugarloaf	Parmeener Supergroup (Gondwana rocks, i.e. intercontinental correlations)	B1 (well exposed partial and complete sections, cf. patchy exposure in S.E. Tasmania)

(3) GEOLOGICAL BOUNDARIES

(a)	Cradle Mountain	Parmeener Supergroup on Proterozoic metasediments	B1
(b)	Weld River area	Weld River Group on Pandani Group	B2 (interesting structural relationships)
(c)	Bubbs Hill, Mt McCall	Wurawina Supergroup on Proterozoic metasediments	B2 (interesting structural relationships)
(d)	South of Battlement Hills	Proterozoic deformed conglomerate on metasediments – contact exposed	A3
(e)	Nye Bay	Mylonite zone between two Precambrian units of contrasting metamorphic grade	B2 (well documented example)

(4) GEOLOGICAL PHENOMENA OR PROCESSES WITH MARKED GEOMORPHIC EXPRESSION

- (a) Cooling joints in Jurassic dolerite: In particular Precipitous Bluff, Lots Wife, Mt Geryon. A2
- (b) Coastal submergence: Port Davey–Bathurst Harbour. B1
- (c) Glacial action: Well documented in original Heritage area nomination.
- (d) Cross-strike (?superimposed) drainage: In particular Gordon River (Big Bend to Olga Junction) and Franklin River (Collingwood Junction to Engineer Range). B1
- (e) Resistant strike ridges: In particular Prince of Wales to Wilmot Range to Frankland Ranges of Proterozoic metaquartzarenite. B1
- (f) Olga Syncline: Valley tract including Hardwood River, Olga River, part of lower Gordon River, lower Franklin River — developed in Ordovician limestone. B1
- (g) Karst and caves: Well documented in Helsham Inquiry.

(5) MINERALS

(a)	Barn Bluff	Cu, Sn and Au	B2 (this style of mineralisation is usually spatially associated with the Mt Read Volcanics)
(b)	Joe Page Bay	Stibnite	A3
(c)	Adamsfield	Osmiridium Chromite Sapphire	A1, C B2 (genetic relationships are of interest) A3
(d)	Jane River	Au containing Hg Cinnabar	A1, C A3
(e)	Mt Weld – east slope	Crystalline quartz	B2 (good crystals up to 40 mm, low temperature origin)
(f)	Bubbs Hill	Sphalerite/galena	B2 (Mississippi Valley style)
(g)	Blakes Opening	Agate	B2 (associated with Proterozoic dolomite)
(h)	Humboldt Mine, Mt Mueller Mine	Cu, Au (Pb, Zn) Ba	B2 (remote from similar mineralisation), C
(i)	Quarry east of Bubbs Hill	Crystalline quartz with double terminations	A3
(j)	Oakleigh Creek	Wolframite	C

(6) ROCKS

(a)	Collingwood River	Talc-kyanite schist	A1
(b)	Barn Bluff, near Mt Pelion	Pelionite (cannel coal)	A3
(c)	Gordon River Road	Lamprophyre	B2 (well exposed, accessible)
(d)	Adamsfield	Ultramafic rocks	A1 (orthopyroxene-rich, high Mg, high Cr in spinels)

(7) FOSSILS

(a)	Trial Ridge	Agnostid trilobites, etc.	B2 (good preservation)
(b)	Humboldt Divide	Stromatolites	B2 (accessible)
(c)	Denison Range	Polymerid trilobites	B2 (good preservation and common in Singing Creek Formation)
(d)	Isle du Golfe	Ordovician trilobites	B2 (abundant, well preserved)

(8) PALAEOGLACIAL FEATURES

Barn Bluff: Exhumed late Palaeozoic *roche moutonnée*, scree.

A2

ABBREVIATED REFERENCES

(1) GEOLOGICAL TERRANES

- (a) Colhoun, 1989: *Geology And Mineral Resources Of Tasmania*.
- (b) Geological Atlas maps: Middlesex, Du Cane, St Clair, Huntley, Pedder.
- (c) Huntley and Pedder geological maps.
- (d) Turner, 1989: *Geology And Mineral Resources Of Tasmania*.
- (e) Pedder geological map; Calver, 1989, Pedder notes; 1990, *Pap. Proc. R. Soc. Tasm.*

(2) GEOLOGICAL FORMATIONS AND UNITS

- (a) Brown *et al.*, 1989: Huntley map notes.
- (b) McClenaghan, 1990: Pedder map notes; Pedder map.
- (c) Turner, 1989: *Geology And Mineral Resources Of Tasmania*; Pedder map.
- (d) Calver, 1990: *Pap. Proc. R. Soc. Tasm.*
- (e) R. H. Findlay in Macquarie Harbour map .
- (f) R. H. Findlay in Macquarie Harbour map.
- (g) R. H. Findlay in Macquarie Harbour map.
- (h) Lyell map; C. R. Calver (in prep. – Lyell map notes)
- (i) Berry & Harley, 1983, *Pap. Proc. R. Soc. Tasm.*; Bischoff, 1983, Hons. thesis.
- (j) P. R. Williams, 1979, Ph.D. thesis, University of Tasmania; 1981, *Pap. Proc. R. Soc. Tasm.* R. H. Findlay (pers. comm).
- (k) Burrett, Stait, Sharples, Laurie, 1984, *Proc. Aust. geol. Conv.*, Aspects of Ordovician System.
- (l) Burrett, Stait, Laurie, 1983, *Mem. Ass. Australas. Palaeontols.*
- (m) S. M. Forsyth, pers. comm.; P. W. Baillie, pers. comm.
- (n) J. K. Davidson, 1970, Hons. thesis University of Tasmania; S. M. Forsyth (pers. comm).

(3) GEOLOGICAL BOUNDARIES

- (a) Mackintosh geological map.
- (b) Calver, 1989, Pedder map notes; 1990, *Pap. Proc. R. Soc. Tasm.*.
- (c) Spry and Gee, 1964, *Geol. Mag.* 101; P. R. Williams, 1971, Honours thesis University of Tasmania.
- (d) Turner, 1989, Huntley map notes.
- (e) McNeill, 1989, *Geology And Mineral Resources Of Tasmania*; Honours thesis University of Tasmania.

(4) GEOLOGICAL PHENOMENA ETC.

Many general references.

(5) MINERALS

- (a) MacLeod, 1961, Du Cane map notes.

- (b) W. E. Baker, 1958, Honours thesis University of Tasmania.
- (c) Bottrill, 1989, in Huntley map notes.
Nye, 1929, *Bulletin Geological Survey Tasmania* 39.
- (d) Bottrill, 1989, *Report Department of Mines Tasmania* 1989/28.
Bacon, 1989, *Report Department of Mines Tasmania* 1989/32.
- (e) C. R. Calver, pers. comm.
- (f) K. O. Reid, 1964, Honours thesis (Geology Department Library) University of Tasmania.
- (g) W. L. Matthews (pers. comm), N. J. Turner (pers. comm).
- (h) Bottrill, 1989, Huntley map notes.
- (i) N. J. Turner, pers. comm.
- (j) Kuys, 1980, Honours thesis (Geology Department Library) University of Tasmania.

(6) ROCKS

- (a) Råheim & Green, 1974, *Contrib. Min. Petrol.* 43, 223–231.
- (b) Banks, 1962, *Geology of Tasmania*; M. R. Banks, pers. comm.
- (c) N. J. Turner, pers. comm.
- (d) Brown, 1989, in Huntley map notes.

(7) FOSSILS

- (a) Jago *et al.*, 1989, *Geology And Mineral Resources Of Tasmania*; Brown, 1989, Huntley map notes.
- (b) C. R. Calver, pers. comm.
- (c) Jago, 1987, *Palaeontology* 30(2):207–231.
- (d) C. F. Burrett, pers. comm.

(8) PALAEOGLACIAL FEATURES

Gee & Burns, 1968, *Report Geological Survey Tasmania* 10.

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