

SUMMARY OF STATE HERITAGE PLACE

REGISTER ENTRY

Entry in the South Australian Heritage Register in accordance with the
Heritage Places Act 1993

NAME: Wilpena Pound Geological Landform **PLACE NO.:** 14376

ADDRESS: Flinders Ranges National Park
CL 888/15, CL 1333/20, CL 1292/40, CR 6140/777, CT 6030/457,
CR 5762/861 and CR 5762/865

DESIGNATED PLACE OF GEOLOGICAL SIGNIFICANCE

STATEMENT OF HERITAGE SIGNIFICANCE

Wilpena Pound Geological Landform is one of South Australia's best known landforms and provides unique insights into the early geological history of South Australia. As an outstanding example of a remnant synclinal basin, Wilpena demonstrates the early formation of the Flinders Ranges, and in particular the 'pound' structures which are typical of the Ranges. Wilpena also contains significant sedimentary features such as large-scale examples of subtidal sand waves, sand flows and soft sand deformation, as well as fossil imprints of Ediacaran fauna. These rare and exceptional qualities have inspired artists and provide special opportunities for visitors.

STATEMENT OF DESIGNATION

Wilpena Pound Geological Landform is one of South Australia's most significant and distinctive geological landforms. It represents an outstanding example of a remnant synclinal basin, formed as part of the interfering N-S, NE-SW and E-W fold trends which meet in this region. Erosion of the softer, underlying rock formations has left this feature as an oval shaped ridge which joins up with the N-S trending Heysen Range.

In addition, the cliff sections of the Pound contain a uniquely continuous exposure of the sedimentary features within the Rawnsley Quartzites, the upper member of the Precambrian, Pound Subgroup. These features include large-scale examples of

subtidal sand waves, sand flows and soft sand deformation formed during the deposition of these rocks when this area was an unstable continental shelf. They also expose the horizon within the Rawnsley Quartzite containing the fossil imprints of Ediacaran fauna (the oldest assemblage of complex marine animals).

RELEVANT CRITERIA (under section 16 of the *Heritage Places Act 1993*)

(c) it may yield information that will contribute to an understanding of the state's history, including its natural history.

Wilpena Pound provides a unique and irreplaceable insight into the early geological history of South Australia, and especially the formation of the Flinders Ranges. The Flinders Ranges were formed about 500 million years ago at the same time as the Mount Lofty Ranges. However, the pattern of formation of the two ranges was very different, with the Flinders Ranges experiencing opposing pressures from north and south which created cyclo-synclinal folds which led to formation of the 'pounds', a distinctive feature of the Flinders Ranges. Wilpena Pound, with its peaks, cliffs, ridges, slopes and gullies, is considered to be the most spectacular and significant example of this type of formation.

In addition to its overall structure, the Pound also retains other features of geological significance. In particular, the cliff sections of the Pound expose Rawnsley Quartzite containing sedimentary features such as large-scale examples of subtidal sand waves, sand flows and soft sand deformation, as well as fossil imprints of Ediacaran fauna.

SITE PLAN

Wilpena Pound Geological Landform
Flinders Ranges

FILE NO: 14376



Site Plan indicating outline of Wilpena Pound Geological Landform (outlined in red).

COMMENTARY ON THE LISTING

Description and notes with respect to a place entered in the South Australian Heritage Register in accordance with the *Heritage Places Act 1993*

Physical Description

Wilpena Pound is an oval shaped basin of approximately 120 square kilometres located at the southern extremity of the Flinders Ranges National Park, 40 km north of Hawker and 55 km south of Blinman.

The Pound is a prominent perched synclinal landform bounded by relatively sheer cliffs of sandstone and enclosing a pound of savannah woodland. The cliffs of the hog back ridges are poorly vegetated due to their exposure, while the slopes and gullies bear a diversity of native vegetation, almost free of introduced species. The interior pound has large stands of native cypress pines (*Callitris columellaris*) and red gums (*Eucalyptus camaldulensis*) and open grassland, modified by former grazing. Dense mallee species cover the surrounding interior slopes. The imposing tooth-like peaks of the Pound rim dominate the landscape of the central Flinders Ranges. St Mary's Peak, the highest point in the southern half of South Australia (1170m) is climbed by thousands of day walkers each year.

The components identified as being intrinsic to the heritage significance of the Wilpena Pound Geological Landform **include**:

- geological landform comprising a synclinal basin including cliffs, ridges, slopes and gullies;
- tooth-like peaks of the Pound, including St Mary's Peak;
- sedimentary features of cliff sections, including large-scale examples of subtidal sand waves, sand flows and soft sand deformation; and
- Rawnsley Quartzite containing fossil imprints of Ediacaran fauna.

The extent of listing **excludes** vegetation and built form.

History of the Place, including scientific background and current condition

The mountain building episode (about 500 million years ago) which formed the present day Mount Lofty Ranges also produced the Flinders Ranges. However, whereas the tectonic movements generated pressure from east to west in the south, resulting in a comparatively narrow belt of mountains thrown into parallel folds, to the north, additional pressures from north and south led to cyclo-synclinal folding producing great dome and basin structures. Erosion has removed the dome structures while the basins are preserved in the remarkable circular ranges or

'pounds' which are such a distinctive feature of the Flinders Ranges today. Wilpena Pound is the most spectacular example of these basin structures.

Wilpena Pound and two of its peaks give their names to the rock formations composing it. The Pound Quartzite, originally named by Mawson in 1938 (now known as the Pound Subgroup), is comprised of the red Bonney Sandstone (after Point Bonney) and the white Rawnsley Quartzite (after Rawnsley Bluff). These rocks represent the youngest of the Precambrian, Adelaidean succession within the Adelaide Geosyncline, and together with other units of the Upper Wilpena Group, are entirely confined to the Flinders Ranges. They represent invasions and regressions of the sea when this area was part of the continental shelf at the end of the Marinoan (about 600 million years ago). The Subgroup has a wide distribution in the Flinders Ranges where it reaches a maximum thickness of 2,700m near Copley. In the type area near Wilpena Pound it is approximately 900m thick.

The Bonney Sandstone contains features reflecting its original sedimentary deposition. These include tabular cross-bedding, wavy bedding, micro-cross-bedding, trough cross-bedding, lenticular bedding, ripple marks, small scale slumps, mudcracks, clay intraclasts and parting lineation, all indicative of a shallow water, tidally-influenced marginal-marine environment.

The Rawnsley Quartzite, which overlies the Bonney Sandstone, is a thicker sequence generally exposed in ridges of higher relief. Similar ridges such as the Chace Range to the SE and the Elder Range to the SW represent companion remnants of this resistant quartzite. It also contains sedimentary structures which include parallel laminations, tabular and cross-bedding, lenticular bedding, ripple marks, mudcracks and rare rain-drop imprints. The lower part of the Rawnsley Quartzite contains the fossiliferous Ediacara Member, the oldest metazoan assemblage known to science, discovered by Sprigg in 1946. The animals became stranded in the shallow tidal channels of a changing shore line. This horizon is confined to a thin band of strata which can be followed around the entire Pound.

Due to the difficult nature of the terrain, most of the rim of the Pound is in untouched condition. The main pressures are from walkers in the area close to the existing Wilpena camping ground and chalet. Foot tracks to Mount Ohlssen Bagge, St. Mary's Peak and through Pound Gap are well marked. There are also trails within the Pound to Edeowie Gorge, through Bridle Gap and across Tanderra Saddle. On the SE corner, a marked trail leads to cave paintings at Arkaroo Rock. Nearby, climbers use an unofficial trail to faces near Rawnsley Bluff. Bush fires, in recent years, have destroyed large areas of well wooded slopes with associated flaking and blackening of rock faces.

References

- Cloud, P., & Glaessner, M. F. (1982). The Ediacaran Period and System: Metazoa inherit the earth. *Science*, 217, pp 783-792.
- Daily, B., Twidale, C.R., & Alley, N.F. (1969). Occurrence of lower Cambrian sediments in Wilpena Pound, Central Flinders Ranges, South Australia. *Australian Journal of Science*, 31, 301-302.
- Donovan & Associates and Austral Archaeology (1995), *Flinders Ranges Heritage Survey*, 'Wilpena Pound UNG-RSR-08', Vol 9, p 51.
- Forbes, B.G. (1972). *Parachilna, South Australia: Explanatory Notes*. 1:250,000. Geological Series. Geological Survey of South Australia. South Australian Government.
- Gehling, J.G. (1982). *Sedimentology and stratigraphy of Late Precambrian Pound Subgroup, Central Flinders Ranges, South Australia*. (Unpublished Master's thesis), University of Adelaide, South Australia, Australia.
- Jenkins, R.J.F. (1981). The concept of an 'Ediacaran Period' and its stratigraphic significance in Australia. *Transactions of Royal Society of South Australia*, 105, pp 179-194.
- Mawson, D. (1941). The Wilpena Pound Formation and underlying Proterozoic Sediments. *Transactions of Royal Society of South Australia*, 65, pp 295-300.
- Parkin, L.W. (ed.). (1969). *Handbook of South Australian Geology*. Geological Survey of South Australia.
- Preiss, W.V. (1987) *The Adelaide Geosyncline, Late Proterozoic Stratigraphy, Sedimentation, Palaeontology and Tectonics*. Bulletin 53, Department of Mines and Energy, Geological Survey of South Australia.

SITE DETAILS

**Wilpena Pound Geological Landform
Flinders Ranges**

FILE NO: 14376

FORMER NAME: Wilpena Pound, Ikara

DESCRIPTION OF PLACE: Synclinal basin including peaks, cliffs, ridges, slopes and gullies; as well as sedimentary features including subtidal sand waves, sand flows and soft sand deformation and fossil imprints of Ediacaran fauna.

DATE OF COMPLETION: c 500 million years ago

SA HERITAGE REGISTER STATUS:

| | |
|---------------------|---|
| Description: | Confirmed |
| Date: | 27 June 2014 |
| Description: | Provisionally entered |
| Date: | 14 Aug 1997 to 31 Dec 2011, 4 May 2012 |

LOCAL HERITAGE STATUS n/a

CURRENT USE:

| | |
|---------------------|---------------------|
| Description: | Geological landform |
| Dates: | n/a |

PREVIOUS USE(S):

| | |
|---------------------|---------------------|
| Description: | Geological landform |
| Dates: | n/a |

ARCHITECT: N/A

BUILDER: N/A

LOCAL GOVERNMENT AREA:

| | |
|---------------------|----------------|
| Description: | Unincorporated |
|---------------------|----------------|

LOCATION:

| | |
|---------------------|-----------------|
| Town/Suburb: | Flinders Ranges |
| Post Code: | 5434 |

| | | | | | | | | |
|--------------------------|--------------------|------------|----------|--------------------|--------------------|----------------------|----------|----------|
| LAND DESCRIPTION: | Title Type: | CL | CL | CL | CR | CT | CR | CR |
| | Volume: | 888 | 1333 | 1292 | 6140 | 6030 | 5762 | 5762 |
| | Folio: | 15 | 20 | 40 | 777 | 457 | 861 | 865 |
| | Lot No.: | - | - | Q 2029 | A25 | - | - | - |
| | Plan No.: | H350400 | H350400 | D36240 | F40683 | H350500 H350400 | H350400 | H350500 |
| | Section: | 13, 17, 18 | 12 | 35 | 106 | 10, 10 | 30 | 39 |
| | Hundred: | MORALANA | MORALANA | OH (PARACHILNA) | OH (PARACHILNA) | WARCOWIE MORALANA | MORALANA | WARCOWIE |

PHOTOS

Wilpena Pound Geological Landform
Flinders Ranges

FILE NO: 14376



Aerial view of Wilpena Pound from west.

*The Adelaide Geosyncline Bulletin 53, Geological Survey of South Australia (front cover).
Photo 35709, Australian Landsat Station.*

The uppermost Adelaidean Wilpena Group occupies most of the area shown, commencing with Brachina Formation at bottom right, overlain successively by ABC Range Quartzite (forming cuestas), red shale of the Bunyeroo Formation (valley in centre), Wonoka Formation (pale coloured band), red Bonney Sandstone, and finally, ridge-forming Rawnsley Quartzite outlining the Pound's synclinal structure.

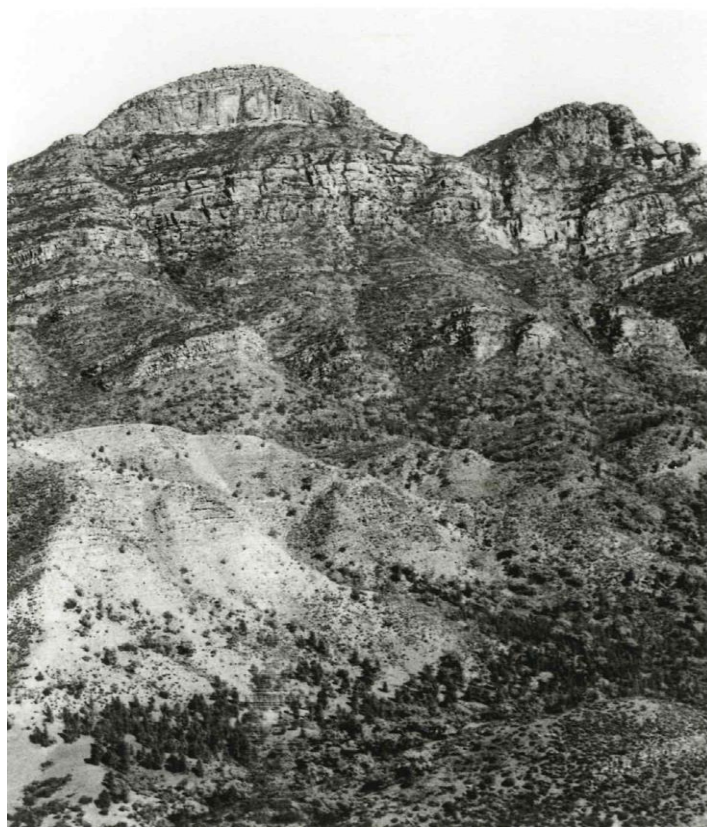
PHOTOS

Wilpena Pound Geological Landform
Flinders Ranges

FILE NO: 14376



Aerial view of Wilpena Pound looking north-west.



St Mary's Peak.

PHOTOS

Wilpena Pound Geological Landform
Flinders Ranges

FILE NO: 14376



View of Pound from lookout on Blinman Road.



Rawnsley Bluff from the east.