

SUMMARY OF STATE HERITAGE PLACE – DESIGNATION

REGISTER ENTRY

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

NAME: GEOLOGICAL MONUMENT - MYPONGA BEACH COASTLINE **PLACE NO.:** 14108

ADDRESS: Kurna Country
Myponga 5202

CR 5926/704 H150700 S217, CR 5625/493 H150700 S756, CR 5625/492
H150700 S755, CR 5744/728 H150700 S770, CR 5744/729 H150700 S771,
including Government Road. Hundred of Myponga

STATEMENT OF DESIGNATION

Designated Place of Palaeontological Significance

The Geological Monument - Myponga Beach Coastline is the only easily accessible and well-exposed area of Sellick Hill Limestone in South Australia¹. The site's palaeontological areas are split into two, with each containing abundant and diverse fossil fauna dating from the early Cambrian period (believed to be ~541-509Ma (Million years ago)).

The Western outcropping at Myponga Beach contains some of the best-preserved examples of *Hyolithes* in South Australia. *Hyolithes* were a genus of marine invertebrates that resemble conical snails² and were in such high concentrations that under the influence of strong currents some have been preserved with the shells inserted into one another.

Hyolithes are used for global correlation of Cambrian fossil sites and therefore connect this South Australian locality to the rest of the world³. Abundant and rare Cambrian trace fossils can be found throughout the locality's western side, including a great quantity of exposed and well-preserved worm burrows and foraging tracks. Trace fossils require extremely specific depositional environments, and at Myponga these are better preserved than similarly aged fossils at Mount Scott Range⁴ and would benefit from further research.

While *Hyolithes* are the most recognised shelly fossil, various rare fossilised South Australian gastropods⁵ and other shelly fossils can also be found⁶. All three are found in high concentrations in the Myponga Beach Coastline sediments.

Additional, rare, trace fossils described from the site include those from the worm-like *Monocraterion*⁷. Other burrows have been identified as trace fossils from *Treptichnus* (*Phycodes*) *pedum*, a unique Cambrian organism that is often used to determine the Ediacaran-Cambrian boundary⁸. Large slabs of wave beds can be readily found and contain multiple distinct trace fossils, illustrating the diverse ecosystem at the time of deposition⁹. The site also contains calcareous algae and examples of shallow-water stromatolites¹⁰. However, little work has been conducted on these remarkable fossils.

Ancient sponges, *Archaeocyatha*, can also be found on the eastern side of the beach. Although preserved in a lesser quality than at the Ajax Mine, they provide an important insight into the evolution of animal life.

The Geological Monument - Myponga Beach Coastline also hosts the common Cambrian genus *Dalmanella*¹¹ (small shelly fossils) that can be found throughout the coastal cliffs. *D. macroptera* has been described from the site as well as possible examples of *D. ajax*. This diverse genus has not been found in other protected sediments such as the Emu Bay shale formation and is instead unique to carbonate-based sediment. *Dalmanella* are used for global correlations of stratigraphy and are very important in understanding the age of both the Myponga Beach Geological Site and other Cambrian sites around the world. Overall, the rare and unique fossil assemblage at Myponga provides a valuable snapshot of the depositional environment and depicts a diverse and distinctive Cambrian fossil ecosystem that differs from others found within the State. The area itself is easily accessible, making it an ideal area for education and learning groups to visit.

Elements of Significance:

Elements of heritage significance include (but are not necessarily limited to)

- Numerous rare Cambrian trace fossils throughout the area¹²
- Very well-preserved fossil wave-beds¹³ and exposures of fossiliferous rocks (Sandstones, Limestones, shales etc) within the cliffs and beach front
- Geological landmarks including exposures of the Sellicks Hill Limestone¹⁴, beach and headlands
- One of the best-known localities for *Hyalithes* in South Australia¹⁵
- Well preserved *Archaeocyatha*, one of the earliest reef-building organisms¹⁶
- *In situ* opportunities for education and research
- Diverse fossil presence spread over a 5km cliff face zone allowing:
 - the biostratigraphic context of the site to be determined¹⁷
 - an understanding of the evolution of Cambrian organisms of South Australia
 - an in-depth understanding of the ecosystem and palaeoenvironment unlike any other in the state.

Elements not considered to contribute to significance of place include (but are not necessarily limited to):

- Non-fossiliferous areas and pre-established housing developments/grazing land.

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

The Myponga Beach coastal section of cliffs is divided by Myponga Beach and formed predominantly of fossiliferous limestone. Located on the Fleurieu Peninsula, the area contains sections of the upper Sellick Hill Formation and Fork Tree Limestone¹⁸, making up a large, successive area of coastline. The site has been recognised as a Geological Monument for some time, as the geology shows extensive changes in environment, intense storm patterns and sea level changes, making the area incredibly unique¹⁹. It is also the first example of Cambrian geology found in the Mount Lofty Ranges, giving the area historical significance²⁰.

Aboriginal Cultural Considerations:

The Heritage Places Act 1993 makes provision for the identification, recording and conservation of places and objects of non-Aboriginal heritage significance. The protection and preservation of Aboriginal heritage is provided for under the Aboriginal Heritage Act 1988. Contact the Aboriginal Heritage Unit for listings.

Myponga Beach is indirectly associated with the Dreaming Trail of Tjilbruke who may have passed through Myponga Beach on his journey of mourning after his nephew was killed.

The story tells of Tjilbruke's journey, carrying his nephew's body along the coast of South Australia. Wherever he stopped for a rest, his tears created natural freshwater springs. Although he did not create wells of water at Myponga Beach, the associated Dreaming Trail created on his journey of mourning passes along the coastline, through the area. After placing the remains of his nephew in a cave at Rapid Bay, Tjilbruke then continued his journey, turning inland to meet the coast again at Lonkowar (Rosetta Head). When he arrived feeling tired, he transformed into a glossy ibis and his human body became a memorial of iron pyrite monuments at Barrukungga (Brukungga)²¹.

Early European reports note a strong Aboriginal presence around Myponga. Activities reported in the area at that time included salmon hunting or camping en route to the nearby Wattle Flat basin²².

References

Australian Heritage Council (2006), 'Australia's Fossil Heritage: A Catalogue of Important Australian Fossil Sites', CSIRO Publishing, Victoria, pp.51-70.

Brasier, M (1984) 'Microfossils and small shelly fossils from the Lower Cambrian *Hyolithes* Limestone at Nuneaton, English Midlands', *Geological Magazines*, Vol. 121, pp. 229-253.

- Geological Society of Australia: S. A. Division (1976), 'File No. 0M11 – Myponga Beach'.
- Gravestock, D, *et al.* (2001), 'The Cambrian Biostratigraphy of the Stansbury Basin, South Australia', (Ed. Alexander, E, Jago, J, Rozanov, A and Zhuravlev, A), *Russian Academy of Sciences, Transactions of the Palaeontological Institute, Moscow*, Vol. 282.
- Heritage SA (1978), 'Myponga Beach Coastline – Register Assessment Report; S.A. Heritage Act 1978'.
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- Jenkins, R, Cooper, J & Compston, W (2002), 'Age and biostratigraphy of Early Cambrian tuffs from SE Australia and southern China', *Journal of the Geological Society, London*, Vol. 159, pp. 645-658.
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- Schultz, C (2021), 'Place Name SUMMARY (PNS) 5.01/10 Names around Carrickalinga Creek (2): Kadlatiyangga', The Southern Kurna Place Names Project.
- Skovsted, C, Betts, M, Topper, T & Brock, G (2015), 'The early Cambrian tommotiid genus 'Dailyatia' from South Australia', *Memoirs of the Association of Australasian Palaeontologists*, No. 48, pp. 1-117.
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SITE PLAN

Geological Monument - Myponga Beach Coastline

PLACE NO.: 14108



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(CR 5926/704 H150700 S217, CR 5625/493 H150700 S756, CR 5625/492 H150700 S755, CR 5744/728 H150700 S770, CR 5744/729 H150700 S771, including Government Road. Hundred of Myponga)**

LEGEND

N ↑

-  Minister Environment and Conservation Land
-  Existing State Heritage Place (Indicates extent of proposed Designation Area)

SITE PLAN (DETAIL)

Geological Monument - Myponga Beach Coastline

PLACE NO.: 14108



Eastern and central section of the Geological Monument - Myponga Beach Coastline

LEGEND

N ↑

-  Minister Environment and Conservation Land
-  Existing State Heritage Place (Indicates extent of proposed Designation Area)



Western section of the Geological Monument - Myponga Beach Coastline

LEGEND

N ↑

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- ¹ Geological Society of Australia: S. A. Division (1976), 'File No. 0M11 – Myponga Beach'.
- ² Heritage SA (1978), 'Myponga Beach Coastline – Register Assessment Report; S.A. Heritage Act 1978'.
- ³ Brasier, M (1984) 'Microfossils and small shelly fossils from the Lower Cambrian Hyolithes Limestone at Nuneaton, English Midlands', *Geological Magazines*, Vol. 121, pp. 229-253.
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- ⁵ Twidale, C, Tyler, M & Webb, B (1976), 'Natural History of the Adelaide Region', Chapter 1: Geology, (Royal Society of South Australia, Adelaide), McBriar, M & Mooney, P (1977), 'Geological Monuments in South Australia: Part 1' (On behalf of the Geological Monuments Subcommittee of the SA Division of the Geological Society of Australia Incorporated, pp.103-105).
- ⁶ Jago, J, Gatehouse, C, Alexander, E & Cooper, B (2006), 'Cambrian of Fleurieu Peninsula', In J Jago and W Zang eds, South Australia 2006. XI International Conference of the Cambrian Stage Subdivision Working Group field guide. (Geological Society of South Australia, South Australian Division, Adelaide), pp. 17-19.
- ⁷ Gravestock, D, et al. (2001), 'The Cambrian Biostratigraphy of the Stansbury Basin, South Australia', Russian Academy of Sciences, *Transactions of the Palaeontological Institute, Moscow*, Vol. 282.
- ⁸ Gravestock, D, et al. (2001), 'The Cambrian Biostratigraphy of the Stansbury Basin, South Australia', Russian Academy of Sciences, *Transactions of the Palaeontological Institute, Moscow*, Vol. 282, Jago, J, Gatehouse, C, Alexander, E & Cooper, B (2006), 'Cambrian of Fleurieu Peninsula', In J Jago and W Zang eds, South Australia 2006. XI International Conference of the Cambrian Stage Subdivision Working Group field guide. (Geological Society of South Australia, South Australian Division, Adelaide), pp. 17-19.
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- ¹⁰ Twidale, C, Tyler, M & Webb, B (1976), 'Natural History of the Adelaide Region', Chapter 1: Geology, (Royal Society of South Australia, Adelaide).
- ¹¹ Skovsted, C, Betts, M, Topper, T & Brock, G (2015), 'The early Cambrian tommotiid genus 'Dailyatia' from South Australia', *Memoirs of the Association of Australasian Palaeontologists*, no. 48, pp. 1-117.
- ¹² Heritage SA (1978), 'Myponga Beach Coastline – Register Assessment Report; S.A. Heritage Act 1978'.
- ¹³ Jago, J, Gatehouse, C, Alexander, E & Cooper, B (2006), 'Cambrian of Fleurieu Peninsula', In J Jago and W Zang eds, South Australia 2006. XI International Conference of the Cambrian Stage Subdivision Working Group field guide. (Geological Society of South Australia, South Australian Division, Adelaide), pp. 17-19.
- ¹⁴ Geological Society of Australia: S. A. Division (1976), 'File No. 0M11 – Myponga Beach'.
- ¹⁵ Heritage SA (1978), 'Myponga Beach Coastline – Register Assessment Report; S.A. Heritage Act 1978'.
- ¹⁶ Heritage SA (1978), 'Myponga Beach Coastline – Register Assessment Report; S.A. Heritage Act 1978'.
- ¹⁷ Jenkins, R, Cooper, J & Compston, W (2002), 'Age and biostratigraphy of Early Cambrian tuffs from SE Australia and southern China', *Journal of the Geological Society*, London, Vol. 159, pp. 645-658.
- ¹⁸ Skovsted, C, Betts, M, Topper, T & Brock, G (2015), 'The early Cambrian tommotiid genus 'Dailyatia' from South Australia', *Memoirs of the Association of Australasian Palaeontologists*, no. 48, pp. 1-117.
- ¹⁹ Gravestock, D, et al. (2001), 'The Cambrian Biostratigraphy of the Stansbury Basin, South Australia', Russian Academy of Sciences, *Transactions of the Palaeontological Institute, Moscow*, Vol. 282.
- ²⁰ Jenkins, R, Cooper, J & Compston, W (2002), 'Age and biostratigraphy of Early Cambrian tuffs from SE Australia and southern China', *Journal of the Geological Society*, London, Vol. 159, pp. 645-658.
- ²¹ Telfer, K & Malone G (2013), 'Tjilbruke Story', City of Port Adelaide Enfield, <<https://www.cityofpae.sa.gov.au/explore/arts-and-culture/explore-first-nations-culture/m2y/more-stories/tjilbruke-story>>, Accessed 8/12/2021.
- ²² Schultz, C (2021), 'Place Name SUMMARY (PNS) 5.01/10 Names around Carrickalinga Creek (2): Kadlatiyangga', The Southern Kurna Place Names Project.