

SUMMARY OF STATE HERITAGE PLACE

REGISTER ENTRY

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

NAME: Fitzgerald Bay Stranded Shingle Ridge PLACE NO.: 26443

ADDRESS: near Whyalla

DESIGNATED PLACE OF GEOLOGICAL SIGNIFICANCE

STATEMENT OF HERITAGE SIGNIFICANCE

The Fitzgerald Bay Stranded Shingle Ridge is an elevated shingle ridge deposited by 3m high sea levels during the mid-Holocene period (5,000 years ago) and then regionally uplifted by around 4m. The ridge consists of packed, sub-rounded pebbles and cobbles that now lie 5-8m above the adjacent landscape. It is located parallel to and slightly inward from the modern coastline of western Upper Spencer Gulf between Whyalla and Port Augusta, South Australia.

The Stranded Shingle Ridges were formed through the erosion of the adjacent plateau country when sea levels were up to three metres higher than today, removing material from the cliffs and extensively from the alluvial aprons at their base. The way in which the removed stones were deposited in ridges indicates an ancient sea-level variation associated with the Quaternary Ice-Ages and regional uplift processes in the Upper Spencer Gulf from the late Pleistocene to the mid-Holocene period. They are in largely undisturbed condition and of extreme rarity, with only two other comparable examples known in the world. The Stranded Shingle Ridge near Fitzgerald Bay has particularly high integrity.

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.

The Fitzgerald Bay Stranded Shingle Ridge contributes to our understanding of the geological history of South Australia by providing a record of coastal and marine development processes resulting from the Quaternary Ice Ages and ancient climatic events.

The Fitzgerald Bay Stranded Shingle Ridge is unusual in that it –

- consists entirely of sub-rounded pebbles and cobbles
- is slightly inland at an elevated level in relation to the modern shoreline
- is devoid of sand
- contains an abundance of the fossil mollusc, *Anadara trapezia*, enabling a method for estimating the age of the feature
- provides evidence of a 3m higher Holocene sea level in the upper Spencer Gulf
- provides evidence of 4m Holocene regional uplift across the upper Spencer Gulf area ('hydro-isostatic upwarping')
- is the best representative of the Spencer Gulf shingle ridges, a feature unknown elsewhere on the Australian continent
- is the longest and most prominent of the three ridges on Spencer Gulf, as well as being least disturbed by human activity
- has a highly unusual double-ridge at its northern end which is yet to be explained by geologists.

The combination of material and associated evidence explaining the formation of the stranded Shingle Ridges is not repeated in South Australia. Different elevated beaches and terraces are common around the world but this particular elevated assembly of high-energy-deposited shingles is rare. Two other stranded accumulations of similar material, elevation, age and dimensions have been recorded along the southern Red Sea coast in Egypt (late Pleistocene) and at Munloch in north-eastern Scotland (Holocene) but stranded Shingle ridges are unreported elsewhere on the Australian continent.

STATEMENT OF GEOLOGICAL DESIGNATION (under section 14(7)(b) of the *Heritage Places Act 1993*)

The Stranded Shingle Ridge at Fitzgerald Bay is of geological significance to South Australia as it provides knowledge of coastal and marine development processes resulting from the Quaternary Ice Ages and ancient climatic events.

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LOCATION PLAN

Fitzgerald Bay Stranded Shingle Ridge
Near Whyalla

PLACE NO: 26443



Plan showing location of various Stranded Shingle Ridges in Upper Spencer Gulf

N ↑

LEGEND

-  Location of State Heritage Place
-  Location of other shingle ridges not included in proposed place

SITE PLAN

Fitzgerald Bay Stranded Shingle Ridge
Near Whyalla

PLACE NO: 26443



Site plan generally indicating the boundary of the place

LEGEND

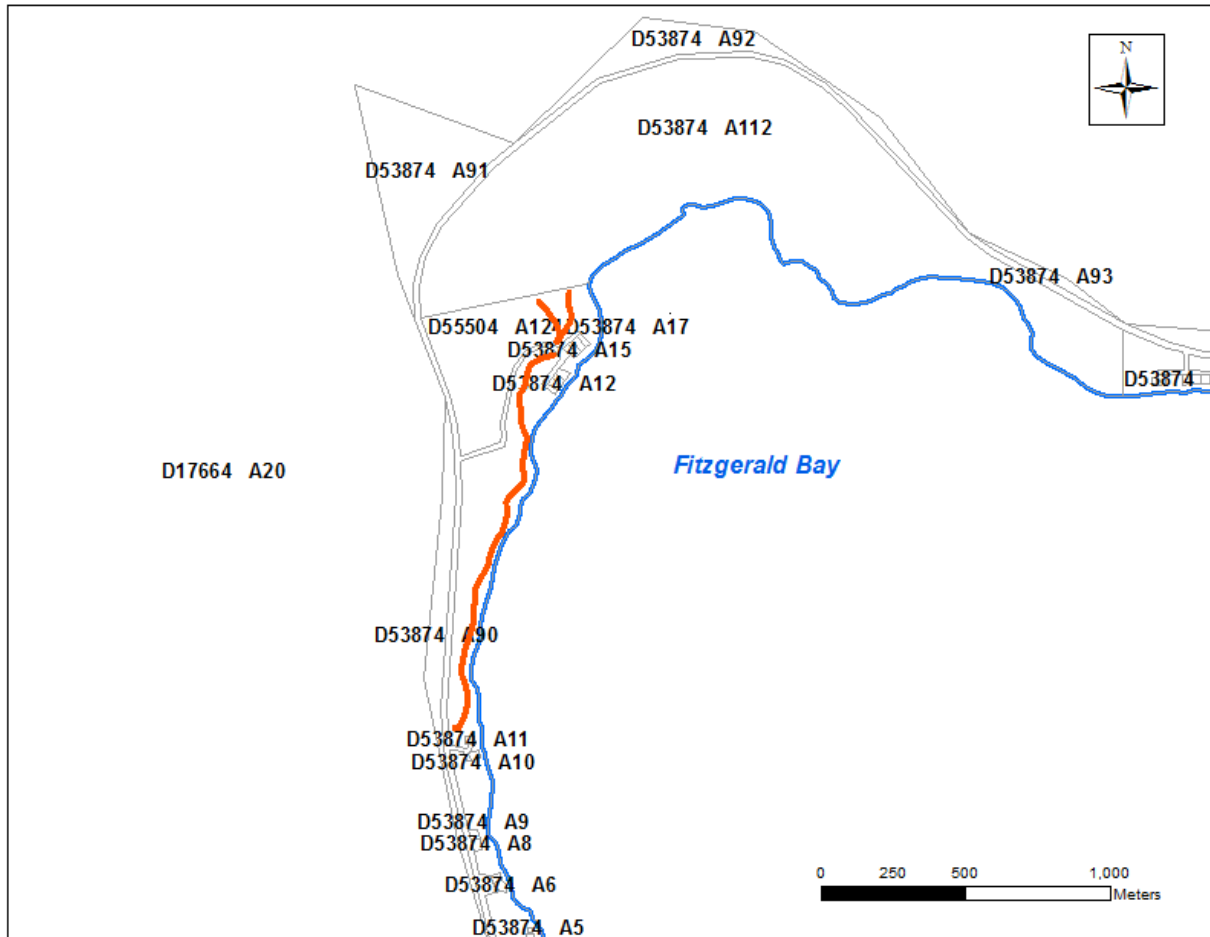
- Boundary of State Heritage Place
- Outline of Stranded Shingle Ridge
- Cadastral boundary



PARCEL PLAN

Fitzgerald Bay Stranded Shingle Ridge
Near Whyalla

PLACE NO: 26443



Plan showing location of parcels: Fitzgerald Bay

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 most significant surviving representative of a series of elevated shingle ridges consisting of packed sub-rounded pebbles and cobbles deposited by 3m higher sea levels and uplifted 4m in the, mid-Holocene period 5,000 years ago which are now 5-8m above the adjacent landscape and located in the area of Fitzgerald Bay.

The components identified as being intrinsic to the heritage significance of Fitzgerald Bay Stranded Shingle Ridge include:

- A stranded shingle ridge system running southwards from Fitzgerald Bay shack community for a distance of ~2kms, just inland from the modern shoreline. The extent of listing excludes:
 - Three less prominent stranded shingle ridges, each ~200m long, located adjacent and parallel to the shoreline over a distance of one kilometre just south of One Shack Bay.
 - A long stranded shingle ridge extending for ~10kms from Blanche Harbour to Commissariat Point, approaching Port Augusta.

History of the Place

After the last Ice Age (LGM - Last Glacial Maximum) ended, Holocene sea levels were 3m higher than current levels. This caused the expanse of sea in the shallow-floored Spencer Gulf to be approximately twice as wide as it is today, covering the Port Pirie Plain on the eastern side of the Gulf.

At the time, the Upper Spencer Gulf area was subject to dominant easterly wind systems and the wide expanse of sea was capable of creating higher and more energetic wave forces than today. Consequently the seas eroded the granites, gneisses and sandstone material from the cliffs of the adjacent plateau country, and extensively from the alluvial deltas at their base.

These stones, weathered and rounded through the action of the sea, were deposited in 'shingle ridges'. When sea levels lowered and new shorelines were created, 4m regional uplift occurred and the shingle ridges were stranded in their current positions.

Recent research (2014) established that regional uplift of the upper Spencer Gulf region has been occurring throughout the Holocene period (12,000-present) and the Shingle ridges formed in the mid-Holocene period, ~5,000 years ago.

Geological timeline

Years Before Present	Event
~26,000–18,000	Last Glacial Maximum and lowest sea levels (-125m)
~18,000	Ice age ends and world starts warming again
~18,000–5,000	Subsequent rising of sea levels
~5,000	Sea within Spencer gulf: <ul style="list-style-type: none">• rose to 3m higher than today• expanded up to 10km wider in the east and west• eroded boulders and rocks from the edge of the adjacent western plateaus• dragged eroded rocks below the shoreline, forming shingle ridges under the sea
~5,000–2,000	Shingle Ridges exposed and stranded by slight lowering of sea level (3m)
5,000–present	Shingle Ridges exposed and stranded by hydro-isostatic uplift of upper Spencer Gulf region (5m)

Historical timeline

Dates	Event
1802	Upper Spencer Gulf shoreline mapped by Matthew Flinders
1803	More local features named by Freycinet during Baudin's French coastal exploration
1836	Settlement of South Australia
1863	British Admiralty observes and records Fitzgerald Bay Shingle Ridge as ' Stony Terrace ', inscribed on the nautical navigation chart of Spencer Gulf
1901	Whyalla founded as 'Hummock Hill'
1945–current	Increase in number of Beach shacks being constructed
1982	Construction of Port Bonython oil and gas refinery at nearby Point Lowly (Stony Point)

References

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- Crawford, A.R. 1963 Quaternary sedimentary breccias and enlarged offshore bars near Point Lowly. *Quarterly Geological Notes* 5;2-3. *Geological Survey of South Australia*.
- Gostin, V. & Hill, S.M. 2014. Spencer Gulf: Geological setting and evolution. In 'Natural History of Spencer Gulf' (Eds. S.A. Shepherd et al), Chapter 2, pp. 21–35. Royal Society of South Australia Inc., Adelaide
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- Hails, J.R., Belperio, A.P. and Gostin, V.A., 1984. Quaternary sea levels, northern Spencer Gulf, Australia. *Marine Geology*, 61:373-389.
- Murray-Wallace, C. V. 2002. Pleistocene coastal stratigraphy, sea-level highstands and neotectonism of the southern Australian passive continental margin—a review. *J. Quaternary Sci.*, Vol. 17 pp. 469–489.

SITE DETAILS

Fitzgerald Bay Stranded Shingle Ridge
Near Whyalla

PLACE NO: 26443

FORMER NAME:	None noted		
DESCRIPTION OF PLACE:	Sinuous elevated pebble-and-cobble bank parallel and just inland of the coastline, extending approximately 1.5km in length southwards from the Fitzgerald Bay shack community.		
DATE OF COMPLETION:	Mid Holocene (approx 5,000 years ago)		
STATE HERITAGE STATUS:	Description:	Confirmed	
	Date:	17 May 2017	
LOCAL HERITAGE STATUS:	N/A		
CURRENT USE:	Description:	Reserve	
	Dates:	N/A	
PREVIOUS USE(S):	Description:	None	
	Dates:	N/A	
ARCHITECT:	Name:	N/A	
	Dates:	N/A	
BUILDER:	Name:	N/A	
	Dates:	N/A	
LOCAL GOVERNMENT AREA:	Description:	Whyalla Council	
LOCATION:	Description:	Upper Spencer Gulf, in the area of Fitzgerald Bay	
LAND DESCRIPTION:	Title Type:	CR	CR
	Volume:	5800	5867
	Folio:	763	224
	Lot No.:	A112	A124
	Plan No.:	D53874	D55504
	Hundred:	CULTANA JENKINS	& CULTANA

PHOTOS

Fitzgerald Bay Stranded Shingle Ridge
Near Whyalla

PLACE NO: 26443

PHOTOS



Fitzgerald Bay Stranded Shingle Ridge, Ian Lewis 2016



Fitzgerald Bay Stranded Shingle Ridge, Ian Lewis 2016



Stranded Shingle Ridge showing source-ranges in background, Ian Lewis 2016

Although no shells are evident in the photo above, the stranded Shingle Ridges contain an abundance of the fossil mollusc *Anadara trapezia*, also known as the Sydney Cockle (below) which has been used to date the ages of the ridge-building to the mid-Holocene, approx. 5,000 years ago.



Anadara trapezia (Deshayes, 1839)
Type: syntype
By: H. Barlow
Australian Museum

Detail of fossil mollusc *Anadara trapezia*, Photo: H Barlow, Australian Museum