Draft Consultation Document

The Case for World Heritage Nomination of the Nullarbor and Great Australian Bight (South Australia)

The Wilderness Society and Sea Shepherd Australia

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The Bunda Cliffs and the Great Australian Bight. Image by Brad Leue

1. The Nullarbor and Great Australian Bight

The Nullarbor Plain is an extensive, arid and flat plain that is virtually treeless (hence its name, Null Arbor, Latin for 'no trees'). Sandwiched between a vast desert and the Great Australian Bight, the Nullarbor is over 1000 km long and about 200 km wide. The Nullarbor contains the world's largest single expanse of limestone, the host rock for a system of huge caves, exquisite formations and underground lakes. This limestone is a former seabed thrust upward millions of years ago.

The Nullarbor Plain has a harsh climate. In summer, daytime temperatures frequently exceed 45 degrees Celsius; in winter, night-time temperatures can plunge well below freezing. Mean annual rainfall is less than 200 mm. Despite this aridity, the Nullarbor is home to fauna that includes wallabies, wedge-tailed eagles and Australia's largest population of the southern hairy-nosed wombat.

The Nullarbor terminates to the south in one of the world's longest stretches of sea cliffs, extending 600 km and reaching heights up to 120 metres.

The cliffs overlook the Great Australian Bight ('the Bight'), an immense expanse of ocean swept by fierce winds and storm-driven swells. The collision of powerful ocean currents produces upwellings of nutrient-rich waters that attract all manner of sea creatures, including whales, sharks, dolphins and seals. These waters are a critical nursery for the southern right whale, pods of which can frequently be seen in the waters below the cliffs. The Australian sea lion, an endangered species, breeds in small colonies on rock platforms.

The jewels in the crown of the Bight are the clusters of small islands. The variety of settings found here, from sheltered coves and lagoons to wave-pounded reefs, create ecological niches for a huge number of different species. According to the CSIRO, the Australian government's primary scientific research body, 85% of the Bight's marine species are found nowhere else on Earth.

The Nullarbor region, including areas of the seabed that in ancient times were above today's level of the sea) has been inhabited for over 50 millennia by First Nations people. The physical evidence of their long occupation consists of rock art, trails and scatters of stone tools. Their cultural heritage is to be found throughout these landscapes and seascapes, which carry deep meaning for the traditional owners. The Yerkala Mirning people have creation stories and cultural traditions pertaining to the area's landforms, plants and creatures. Native animals such as whales, dingoes and sea eagles are members of the Yerkala Mirning's totemic family for whom there are deeply held responsibilities.

To the Yerkala Mirning, the terrestrial landscape is not separate from the submerged ancestral homelands that have been under the waters of the Great Australian Bight for the past 8000 years. The unbounded vistas of the night sky are alive with stories. The cultural landscape of plains, caves, sea and sky is imbued with the myths and sacred sites of a unique cosmology.

Together, the Nullarbor and Great Australian Bight form a vast estate with unique natural and cultural attributes, and the arguments for World Heritage nomination are compelling.

2. What is World Heritage?

The World Heritage List identifies places that the nations of the world have said are so important that they must be protected for future generations.

The List has been compiled under the auspices of UNESCO, the United Nations Educational, Scientific and Cultural Organisation. The mission of UNESCO is to foster peace through international cooperation in science, culture, education and sustainability.

In 1972, UNESCO inaugurated the Convention Concerning the Protection of the World Cultural and Natural Heritage ('the World Heritage Convention'). This is an international treaty that establishes the World Heritage List and the manner in which World Heritage properties are identified, inscribed and monitored. According to the Convention, 'the deterioration or disappearance of any item of the cultural or natural heritage constitutes a harmful impoverishment of the heritage of all the nations of the world.'

The World Heritage Convention is one of the great successes of the United Nations, with 194 countries as signatories. Over 1100 sites have been listed as World Heritage. These include monuments such as the gothic cathedrals of Europe, the great pyramids of Egypt and the sprawling temple complexes in south-east Asia. Properties listed for natural heritage include the Grand Canyon in the USA, Mt Everest in Nepal and Australia's Great Barrier Reef.

To be considered by UNESCO for inscription on the World Heritage List, a property must first be nominated by the country in which it occurs. UNESCO cannot unilaterally declare an area as World Heritage.

'The Nullarbor and Great Australian Bight satisfy seven of the 10 criteria for Outstanding Universal Value, making the area one of the most diverse and valuable heritage properties in the world'

Australia joined the World Heritage Convention in 1974. Since then, 20 properties under Australian jurisdiction have been nominated by the Australian Government and listed as World Heritage, including Kakadu, Uluru, the sub-Antarctic islands and the Tasmanian Wilderness. Australia has also passed laws that provide national protection for World Heritage areas. These have been used to protect the Tasmania's Franklin River from a proposed dam, and to safeguard Kakadu from proposed new uranium mines.

To be inscribed on the World Heritage List, a property must be recognised by UNESCO as having Outstanding Universal Value (OUV). UNESCO has defined 10 criteria for OUV (UNESCO 2018). These are listed in full in Appendix 1. A property must satisfy one or more of these criteria to be listed. It must also satisfy conditions for protection, management and integrity (the intactness of its attributes).

Together, the Nullarbor and Great Australian Bight satisfy seven of the criteria for Outstanding Universal Value. This makes it one of the most diverse and valuable heritage properties in the world.

3. The Outstanding Universal Value of the Nullarbor and Great Australian Bight

The World Heritage criteria that are satisfied by the Nullarbor and Great Australian Bight are stated below, together with brief descriptions of how those criteria are met. The proposed World Heritage property meets seven of those criteria. Currently, there are only two properties on the World Heritage List that meet seven criteria – the Tasmanian Wilderness (Australia) and Mount Taishan (China). Satisfying seven World Heritage criteria makes the Nullarbor and Bight a truly extraordinary candidate for inscription on the List.

The relevant criteria are set out below in the order (vii), (viii), (ix), (x), (v), (iii) and (vi). This is so that the physical setting is described before moving onto the cultural attributes, such as traditions and beliefs, that arise from human interactions with the physical environment.

Criterion (vii): contain superlative natural phenomena or areas of exceptional natural beauty and aesthetic importance:

- **The Nullarbor component of the proposed World Heritage property contains the world's greatest area of limestone in an arid setting.**

- **The proposed World Heritage property contains a huge array of karst features — both ancient and recent — in a largely undisturbed setting, including dolines, blowholes, large caverns, 'breathing caves', domes, speleothems and subterranean lakes.**

- **The proposed World Heritage property contains globally unusual and exquisitely beautiful cave features, such as black, organic-rich speleothems and gypsum and halite speleothems, that originate from the arid environment in which the karst system occurs.**

- **The proposed World Heritage property contains an unbroken line of spectacular sea cliffs (the Bunda Cliffs) that extend for over 100 kilometres, with associated features such as blowholes, sea caves and active sea-cliff erosion.**

- **The proposed World Heritage property presents sweeping vistas of a famously flat and treeless plain, as well as dramatic visual contrasts with caves, cliffs and ocean.**

- **The proposed World Heritage property contains seascapes of impressive immensity and power.**

- **The proposed World Heritage property contains superb scenery created by the interaction of great ocean swells with sea cliffs, reefs, rock stacks and rugged islands, and the contrasting quiet waters in sheltered settings.**

- **The proposed World Heritage property provides spectacles afforded by aggregations and feeding frenzies of sea creatures, including fish, dolphins, sea lions and huge whales.**

Criterion (viii): be outstanding examples representing major stages of Earth's history, including the record of life, significant on-going geological processes in the development of landforms, or significant geomorphic or physiographic features:

- **The geological and geomorphic processes within the Nullarbor component of the proposed World Heritage property have created unique cave-systems and other karst features in an environment that has undergone dramatic changes in climate over the eons.**

- **The proposed World Heritage property's speleothems constitute a globally unique archive extending back into 'deep time', enabling the reconstruction of climates over the last 10 million years.**

- **The Nullarbor component of the proposed World Heritage property is a globally outstanding example of the development and erosion of landforms pertaining to varying climates and sea-levels over the ages, including active sea-cliff erosion, ancient dune-systems and weathered inland cliff lines that once fronted the ocean.**

- **The proposed World Heritage property contains exceptionally well-preserved fossils, including the remains of marsupials long extinct on mainland Australia, such as the Tasmanian tiger (*Thylacinus cynocephalus*) and Tasmanian devil (*Sarcophilus harrisii*), that provide an invaluable record of evolutionary processes prior to European colonisation of Australia.**

- **The proposed World Heritage property exemplifies the phenomena associated with currents and great swells in an expanse of ocean of varying depths, including the world's longest continental shelf aligned in an east-west direction.**

Criterion (ix): be outstanding examples representing significant on-going ecological and biological processes in the evolution and development of terrestrial, fresh water, coastal and marine ecosystems and communities of plants and animals:

- **The Nullarbor component of the proposed World Heritage property exemplifies the geological and biological processes responsible for the evolution of a huge karst system in what is now an arid setting.**

- **The combination of geological and biological processes within the proposed World Heritage property are responsible for the evolution of a diverse and unique troglobitic fauna in an arid setting.**

- **The proposed World Heritage property contains an exceptional variety of pristine inter-related ecological niches that are associated with ocean at different depths and in different settings, including islands, reefs, rock platforms, lagoons, seagrass meadows and the benthic zone.**

Criterion (x) 'contain the most important and significant natural habitats for in-situ conservation of biological diversity, including those containing threatened species of Outstanding Universal Value from the point of view of science or conservation:

- **The Nullarbor karst contains species of troglobitic fauna that have evolved in caves whose external environment has altered dramatically over the eons.**

- **The Nullarbor component of the proposed World Heritage property contains habitats of terrestrial species unique to this part of Australia, including the southern hairy-nosed wombat and Nullarbor daisy.**

- **The parts of the Great Australian Bight within the proposed World Heritage property encompass a complex, pristine and vast web of life, from the most tiny of creatures to the most colossal, including microbes, plankton, crustaceans, pelagic fish, seabirds, pinnipeds, dolphins and whales.**

- **The parts of the Great Australian Bight within the proposed World Heritage property protect globally outstanding apex predators and flagship species, including threatened species such as the southern right whale, the pygmy blue whale, the Australian sea lion and the great white shark.**

Criterion (v): Be an outstanding example of a traditional human settlement, land-use, or sea-use which is representative of a culture (or cultures), or human interaction with the environment especially when it has become vulnerable under the impact of irreversible change.

- **The proposed World Heritage property, including its cave deposits, rock art, waterholes, creatures, plants, ancient pathways, coastline and seascapes, encompasses a cultural landscape for a people who have been masters of survival for over 50 millennia of changing climates and sea levels.**

Criterion (iii): Bear a unique or at least exceptional testimony to a cultural tradition or to a civilization which is living or which has disappeared.

- **The landscapes, seascapes and creatures, particularly the whales, of the proposed World Heritage property embody the living beliefs and traditions of a people that have lived adjacent to a great ocean for over 50 millennia.**

Criterion (vi): Be directly or tangibly associated with events or living traditions, with ideas, or with beliefs, with artistic and literary works of outstanding universal significance. (The Committee considers that this criterion should preferably be used in conjunction with other criteria)

- **The proposed World Heritage property embodies the deep memories of an ancient people for homelands now submerged beneath the ocean as a result of the rise in sea levels over the millennia.**

- **An ancient people's traditions, creation stories and beliefs that relate to totem creatures, particularly those between the Yerkala Mirning and the whales of the Great Australian Bight, are embodied within the proposed World Heritage property.**

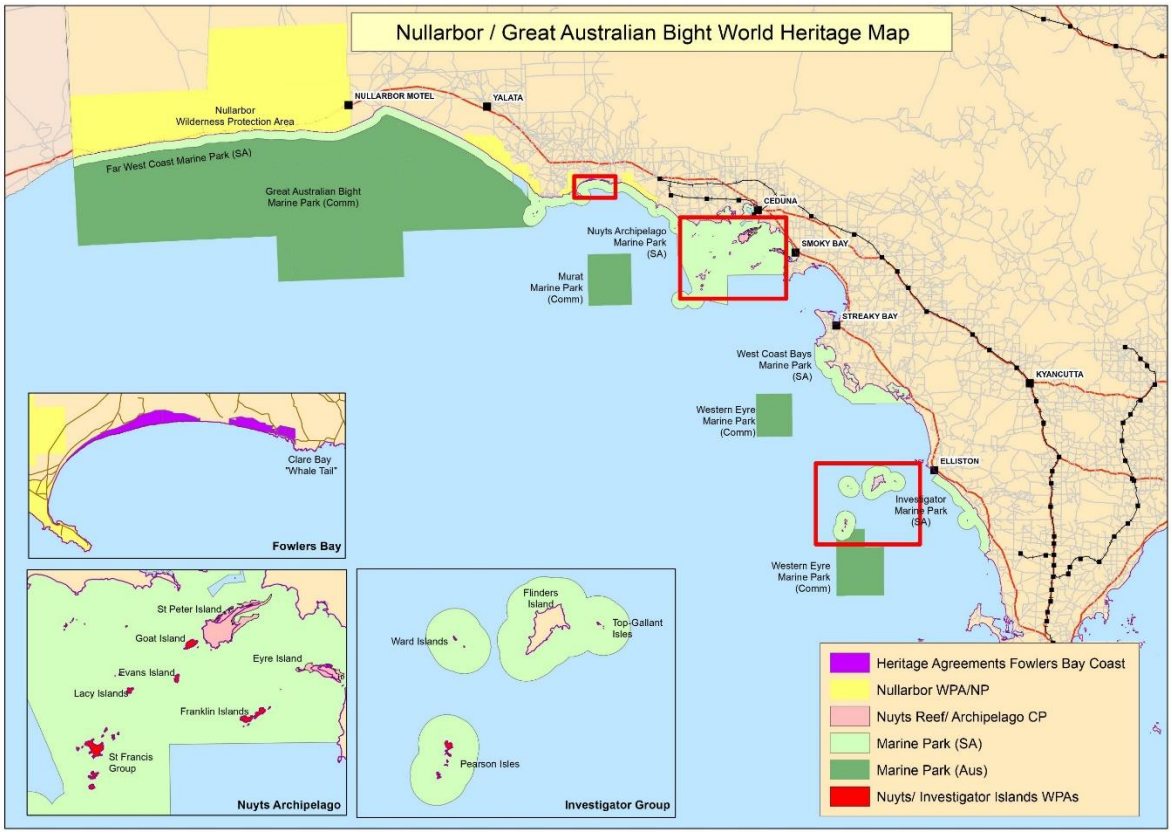
- **The proposed World Heritage property maintains the continuity of elements of culture since at least the Palaeolithic era, keeping meaning alive for the artworks and sites in the World Heritage property.**

4. The boundaries of the proposed World Heritage property

The components of the proposed World Heritage consist overwhelmingly of reserves that already have a high conservation-status. These include a national park, several wilderness-protection areas, several marine parks in South Australian waters, and the national-park zones of three Commonwealth marine reserves, as illustrated in the map below.

'The components of the proposed World Heritage property consist overwhelmingly of reserves that are already highly protected'

This approach also enables the proposal to meet UNESCO's conditions of protection and management. The proposal is nevertheless immense, encompassing over 40,000 square kilometres of land, coastline and ocean.



The proposed World Heritage property consists of the reserves identified in the legend. Additional areas, such as parts of the Yalata Indigenous Protected Area adjacent to the Nullarbor WPA, parts of the Wahgunyah Conservation Park and areas of Private Heritage Agreement Land, could also be added to the World Heritage property, subject to appropriate negotiations with Traditional Owners, other owners and other key stakeholders.

Some of these reserves are spatially separated from others. This is not a problem as there are numerous World Heritage properties globally that consist of spatially separated components. These are known as 'serial properties'. An Australian example is the 'Gondwanan Rainforests of Australia'.

An international example is the 'Ancient and Primeval Beech Forests of the Carpathians and other Regions of Europe' which consists of over 50 sites across 18 different countries!

5. The World Heritage attributes in detail

5.1 The Nullarbor Karst

Landscapes containing caves and other features created by the erosion of water-soluble rock such as limestone are called 'karst'. Such landscapes, and the spectacular features contained within them, are well recognised for their scenic and scientific qualities.

The Nullarbor comprises the world's largest uplifted limestone plateau, and by far the world's largest karst in an arid zone (Davey AG et al. 1992, p. vii). This karst is set in a vast flat plain that terminates abruptly in a line of cliffs plunging into the sea that extends for hundreds of kilometres. Inland lie an ancient network of drainage lines and several ancient shorelines, now over 100 km from the ocean.

The Nullarbor's network of caves was formed between 2.5 and 10 million years ago, during a period when the global climate was much wetter. Subterranean waters are a feature of these huge cave-systems. Caves range from small blowholes to enormous cathedral-like chambers, some containing lakes, that lead to underwater passages that can extend for many kilometres. The Nullarbor karst contains a wide variety of features, including dolines, blow holes, pavements, rock holes, cliffs, clifftop dunes, collapse chambers, domes, speleothems and clastic floors (Davey AG et al. 1992, pp.24-37).

The processes by which caves have formed and been preserved in the Nullarbor are well described (Davey AG et al. 1992, pp. 60-68; Webb & James 2006). Although originating in a wet climate, the Nullarbor caves are now confined to an arid zone, allowing preservation of exquisite structures many millions of years old, quite unlike caves already inscribed on the World Heritage List. The presence of water is a critical part of karst development, and its general scarcity on the Nullarbor over the last million years is responsible for many of the unique qualities of this karst environment. The features developed by slow dissolution of limestone in a geologically stable landscape present a distinct contrast to those sculpted by vigorous streams in steep, rapidly up-thrusting terrains such as those in Europe. Although there is no permanent surface water on the Nullarbor, there is a vast subterranean supply that occurs at different depths (ranging from 120 metres to less than 10 metres) and plays a critical role in the continuing evolution of the caves.

'This is a cave system of great antiquity'

Cave formations composed of halite, or common salt, occur in the Nullarbor in a variety and abundance unique in the world. Gypsum, too, has formed a variety of different cave features in the Nullarbor, such as 'coffee and cream' layering, needles, helictites, 'flowers' and other speleothems of varied colour and shape. The caves' unique mineralogy owes much to their arid setting (Davey AG et al. 1992, pp.69-74). Many of the Nullarbor speleothems are highly organic and dark brown to black in colour, unlike most speleothems worldwide. Speleothems composed of phosphorus, iron, manganese and diverse forms of calcite have also been described (Blyth et al. 2010; Caldwell J. et al. 1982).

The Nullarbor caves are remarkable (and are an outstanding example worldwide) for 'cave breathing'. Enormous volumes of air can pass through them. It can often be extremely 'windy' at the entrances and the direction of movement usually reverses according to the time of day. This is an unusual phenomenon and not entirely understood as the volumes of air involved seem too large to

be explained by just the expansion and contraction of air due to changes in temperature. Explanations of this phenomenon have focussed on the Nullarbor examples (Wigley 1967, pp. 3199, 3203). According to Richardson (1971, p. 41), such movements of air have occurred at rates of over 100 cubic metres per second and could be responsible for dispersal of arthropods within the cave.

This is a karst system of great antiquity. Recent research shows that the caves first formed during the Miocene epoch, some 10 million years ago, with the bulk of development during the Pliocene epoch, between three and five million years ago. Speleothems constitute an archive extending back into 'deep time' (with a median age of 4.2 million years), enabling the reconstruction of climates and environments over millions of years. Many of these speleothems became 'frozen in time' when the Australian continent drifted into aridity, terminating the dynamic processes that would otherwise have created new features in place of older ones (Woodhead 2019; Woodhead et al. 2019).

One of the remarkable characteristics of the Nullarbor is the existence of greatly weathered landforms whose original setting no longer exists. These include ancient but well-preserved water courses through which great quantities of water once flowed. This phenomenon is known as 'palaeodrainage' and takes the form of discontinuous hollows linked by dry lakebeds (known as playa), and remnants of vast underground river courses. Similarly, parts of ancient (Eocene and Miocene) shorelines, including sand dunes and sea cliffs, are preserved inland at great distances from where the coast occurs today. These features have been preserved by slow tectonic uplift of the area combined with its aridity.

The caves of the Nullarbor have long been recognised for the unique fauna that is the product of the arid, flat setting and the absence of streams (Richardson 1971, p. 43). Significant endemics include species of beetle, other insects, crustaceans and spiders (Davey AG et al. 1992, p. 77). According to Davey et al, the Nullarbor troglobites are like a zoological 'time capsule' (pp.44-45).

The wildlife outside the caves is also of interest. The Nullarbor Plain is home to the world's largest population of southern hairy-nosed wombat (*Lasiorhinus latifrons*). Known to the area's indigenous inhabitants as wardu, this species of wombat is listed as 'near threatened' on the IUCN Red List of Threatened Species (IUCN 2014). Overhangs and cave entrances provide critical nesting sites for bats (such as *Chalinolobus morio*) and for birds, including Australian kestrel (*Falco cenchroides*), welcome swallows (*Hirundo neoxena*) and owls (including a sub-species of the masked owl *Tyto novae-hollandiae*) (Davey AG et al. 1992, p. 45; Eberhard & McBeath 2003).

Many of the Nullarbor's caves contain exceptionally well-preserved fossils. These include skeletons of Tasmanian devils (*Sarcophilus harrisii)* and thylacines (*Thylacinus cynocephalus*). The celebrated thylacine, or Tasmanian tiger, has been extinct on mainland Australia for about 3000 years; the last captive thylacine died in a Tasmanian zoo in 1936. The Tasmanian devil has also been extinct on the Australian mainland for a long period. Such fossils therefore enhance our knowledge of ecological change in Australia, both from natural causes and from the arrival of humanity (Davey AG et al. 1992, pp.53-54). The caves also contain a zoological archive in the form of many years' worth of accumulation of the bones of small animals and the droppings of carnivorous birds.

'Many of the Nullarbor's caves contain exceptionally well-preserved fossils'

The advisory body to UNESCO on natural World Heritage sites, IUCN, has published a report that describes the importance of the Nullarbor karst in a global context (Williams 2008, pp. 6, 10). IUCN points out that the World Heritage List has 'significant gaps in the distribution of karst', including in

the Southern Hemisphere generally, and Australasia and the South Pacific in particular. IUCN also identified 'poor representation' of inscribed karst properties in arid and semi-arid environments. The report recommended that future nominations for World Heritage should give particular attention to outstanding karst areas in these arid and/or Australasian regions (pp.6, 10) and made special mention of the Nullarbor (p.11). It pointed out that the Nullarbor karst is potentially of greater value than some areas already canvassed elsewhere for World Heritage nomination.

The global significance of the Nullarbor has been affirmed by other authorities. Davey et al (1992) described it as 'the world's largest area of arid and semi-arid karst and the largest contiguous karstland in the world', containing caves that are more extensive than those generally found in arid areas. The vast subterranean carbonate aquifer is a critical feature of the Nullarbor that is not matched in other arid systems such as those in New Mexico (USA), the Middle East or north Africa. Some of these systems are being exploited for irrigation (pp.86-87), a threat that is not applicable to the Nullarbor, given its distance from arable, settled lands. The Nullarbor has additional features that are globally remarkable, including its long boundary with the ocean; certain chemical influences that create vast caverns; its formation in a tectonically stable landscape; its international recognition as the classical karst for research and education pertaining to arid karst (p.87); and its prominence as a venue for cave-diving expeditions (p.88).

The Nullarbor caves provide an outstanding example of how major karst features can be preserved for millions of years in an environment now lacking in surface waters and dramatic relief. These outstanding attributes, combined with the area's arid setting and location in Australasia, therefore make the Nullarbor karst a compelling candidate for World Heritage nomination.

5.2 Sea Cliffs

The Nullarbor Plain terminates in a line of spectacular sea cliffs, with the waves of the Great Australian Bight crashing below. This cliff line comprises two major sections – the Bunda Cliffs (210 km) in South Australia and the Baxter Cliffs (160 km in Western Australia). There are only a few places where the cliffs can be descended, otherwise, for over 200 km, they fall sheer into the sea or onto wave-swept rockpiles (Davey AG et al. 1992, p. 27). According to Davey (p.30) there are plentiful examples of karst sculpture and sea caves along the base of the cliffs.

'This is probably the longest continuous line of sea cliffs in the world'

The cliffs constitute an abrupt transformation from the still expanses of the Nullarbor to the turbulent swells of the Southern Ocean (Davey AG et al. 1992, p. 80). Expert descriptions of the cliffs extol their national and international significance for the rarity of their scale, their demonstration of the evolution of the landscape, and their spectacular beauty (Davey AG et al. 1992; Wakelin-King & Webb 2020), making these cliffs a compelling candidate for World Heritage nomination.

5.3 A globally outstanding and pristine marine environment

Globally, there are at least 50 properties containing significant seascapes on the World Heritage List. These occur predominantly in the tropics, with relatively few in the temperate or polar zones, and very little representation of waters near the shore. In fact, temperate Australasian waters have been identified as a significant gap when it comes to World Heritage listings, with relevant nations encouraged to make nominations to fill that gap (Abdulla et al. 2013, pp. ix, 32-33, 44).

IUCN, the expert body that advises UNESCO on such issues, has identified 16 themes under which suitable areas of ocean could be nominated for World Heritage (Abdulla et al. 2013, p. 10). These include large-scale movements of water, such as currents and swells, under criterion (viii); intact marine ecosystems under criterion (ix); threatened species or 'flagship species' under criterion (x); and marine phenomena and spectacles under criterion (vii). All of these are applicable to the Great Australian Bight.

The Great Australian Bight is a pristine ocean whose physical and biological processes are intact. The Bight's reefs, rock stacks and archipelagos are the jewels in the crown of this vast estate. They are beautiful features that also provide a host of interconnected ecological niches. More than 85 per cent of known species in the Bight are found nowhere else in the world (CSIRO et al. 2018a, p. 7).

'More than 85% of the species in the Bight are found nowhere else on Earth'

The Great Australian Bight holds the world's longest east-west continental shelf and is subject to complex circulations driven by major ocean currents, intense winds, big ocean swells and large-scale movements of seawater at different depths (CSIRO et al. 2018b, p. 7). This is one of IUCN's themes under OUV criterion (viii).

These massive systems of ocean movement, in turn, underpin the Bight's rich ecosystems (CSIRO et al. 2018a). The Bight hosts the full range of marine species, from microbial organisms, plankton, krill and crustaceans to big fish, seals and whales. A recent research program identified 277 species new to science and 887 species new to the Great Australian Bight (CSIRO et al. 2018a, p. 19). Organisms that live on the sea floor (benthic) play a vital role in the deep-water food chain that supports species such as the Australian sardine and southern bluefin tuna. Coastal ecosystems nourish crustaceans (southern rock lobster, prawns and crabs) and finfish. Each year, millions of short-tailed shearwaters migrate to the region to breed and forage in its productive waters.

Recent surveys carried out in Bight have detected a wide range of fauna (CSIRO et al. 2016). Surveys assessed the diversity of shark species, recording the great white, shortfin mako, blue, school, bigeye and thresher sharks. The occurrence in the Bight of the bigeye thresher shark (previously associated with warm waters of the tropics and sub-tropics), and its 2000-km migration to waters off Exmouth, Western Australia, was a new scientific discovery.

The proposed World Heritage property also includes the waters surrounding two archipelagos, the Investigator and Nuyts groups. Where the swells and currents of a big open ocean impinge upon these islands, a diverse set of ecosystems is created. These islands are particularly important for the Australian sea lion and New Zealand fur seal (Government of South Australia 2012a, 2012b).

The waters of the Investigator Marine Park support a huge diversity of flora and fauna, including several endemic species. These include the light-emitting golden roughy (*Aulotrachichthys pulsator*), which has been found only in the Investigator Marine Park (Bray 2017) and the western blue groper (*Achoerodus gouldii*) (Government of South Australia 2012a).

'The Nuyts and Investigator islands contain a diversity of beautiful habitats, from exposed cliffs and rock platforms to meadows of seagrass'

The Nuyts Archipelago is a complex, interconnected network of islands, shallow bays and estuaries. The archipelago's cliffs, reefs and rock platforms are exposed to powerful waves, while sheltered waters have seagrass meadows and mangroves. Endemic invertebrate species include the small murex gastropod (sea snail) *Favartia,* species of brain and cabbage corals (*Coscinarea, Turbinaria and Goniastrea spp* at Point Fowler), the gastropod *Anachis fenestrata* (a small dove shell) at St Francis Isles, and the sponge *Clathria* (*Dendrocia curvichela*). Little penguins and other waterbirds use the diverse habitats for feeding and breeding (Government of South Australia 2012b).

The intactness and diversity of these interrelated ecosystems mean they can be categorised under one of IUCN's World Heritage themes.

The Bight is a regional hotspot for marine predators. Its open waters provide habitats and migration pathways for charismatic species at the top of the food chain such as southern right whales and pygmy blue whales. Globally, it is the most significant feeding ground for juvenile southern bluefin tuna and is home to more than 80% of the country's Australian sea lions and New Zealand fur seals. The Bight hosts Australia's largest aggregation of breeding southern right whales (*Eubalaena australis*), which migrate to the region to calve in winter. It provides foraging waters for pygmy blue whales during summer and autumn. The Bight provides critical habitat for several threatened species, including the Australian sea lion, southern right whale, pygmy blue whale and great white shark (CSIRO et al. 2018a, pp. 7, 23-25) .

'The Great Australian Bight hosts Australia's largest aggregation of breeding southern right whales'

Recent surveys carried out in different regions of the Bight have detected a wide range of fauna (CSIRO et al. 2016). As well as the species listed above, there are humpback whales (*Megaptera novaeangliae*), minke whales (*Balaenoptera sp.*), killer whales (*Orcinus orca*), bottlenose dolphins (*Tursiops spp.*), and 20-22,000 short-beaked common dolphins (*Delphinus delphis*).

The southern bluefin tuna (*Thunnus maccoyii*) is another celebrated apex predator that roams the Bight. Fast and big, they migrate across the oceans and can dive up to 1000 metres deep (WWF 2022). The aggregation sites of the species occur outside of the proposed World Heritage property, but the southern bluefin tuna is nevertheless a frequent visitor to most of the waters of the Bight.

The Great Australian Bight hosts several flagship species (CSIRO et al. 2018a, pp. 23-27). Some examples are as follows.

The southern right whale

The southern right whale (*Eubalaena australis*) is a spectacular marine mammal, second in mass only to the blue whale (the world's largest creature). The average length of southern right whales is 14.5 metres and historical reports suggest they can grow up to 17.5m and weigh up to 80 tonnes. This makes it one of the greatest animals ever seen on Earth.

It is a dark-coloured baleen whale distinguished by the lack of a dorsal fin, a rotund body shape and the whitish callosities on the head. With a circumpolar distribution between latitudes 16°S and 65°S, the southern right whale is the sole representative of the family Balaenidae in the southern hemisphere. It is closely related to the right whales of the northern hemisphere – *E. glacialis* (North Atlantic) and *E. japonica* (North Pacific). Although very similar, the species of the two hemispheres are reproductively isolated from one another by the geographic separation of calving grounds and asynchronous breeding seasons (Australian Government 2012, p. 2).

'The southern right whale is one of the biggest creatures ever seen on Earth'

Southern right whales can be observed in calm waters nursing their young, socialising and mating. They have been filmed indulging in aerial behaviour (South Australian Whale Centre 2022) such as breaching, blowing, 'spy hopping' (furtively lifting the head above water to eye level in order to look around), 'lobtailing' (whacking the tail hard against the water), body rolling and tail-lifting. Because they frequent coastal waters for up to four months in winter, these impressive spectacles are available to the public eye.

As with other whale species, southern right whales were hunted to the brink of extinction in the nineteenth and twentieth centuries. An estimated population of 55-70,000 southern right whales was reduced to about 300 by the 1920s. International efforts to protect whales have achieved a steady increase in the global population of the southern right whale, with recent research indicating a global population exceeding 13,500 whales. In 2020, the population of southern right whales frequenting the waters of the Great Australian Bight stood at about 2900 (about 20% of the global population) and was increasing at almost 7% per annum. This is the maximum possible biological rate of increase, a tribute to the protection conferred both internationally and through concerted efforts in Australia.

Southern right whales occupy coastal waters from May to October, usually in waters less than 10 m deep and within 1 km of the shore, to nurse their young, mate, rest and socialise. On average, southern right whales have a single calf every three years. Female southern right whales often return to the same location to give birth and nurse offspring, a behaviour known as 'calving-site fidelity'. Well-frequented calving grounds are therefore critically important to the future of the species (Australian Government 2012, p. 4).

As the Australian population of southern right whales increases, its range is extended. Small and emerging aggregation areas will therefore acquire increased importance. Research shows that the Head of Bight has reached saturation, leading to an increase in whale numbers in adjacent habitat such as Fowlers Bay (Charlton, Ward, R., Brownell, Salgado Kent & Bannister 2019; Charlton, Ward, R., Brownell, Salgado Kent & Burnell 2019).

The Australian sea lion

The Australian sea lion (*Neophoca cinerea)* is a large and energetic marine animal. Males can grow to about two metres in length and 220 kg in weight (AFMA 2015). It is a pinniped, a group of

carnivorous, fin-footed mammals commonly known as seals. The Australian sea lion is Australia's only endemic marine mammal and is one of the most endangered pinnipeds in the world (Goldsworthy, S 2015). These sociable and intensely curious animals forage up to 200 km from their colonies and can dive down to 180 metres.

'The Great Australian Bight and adjacent waters are the prime habitat of the endangered Australian sea lion'

Sea lions forage on the seabed and their diet is extremely broad, consisting of many species of fish, cephalopod and crustaceans. Great white sharks will attack and eat sea lions. The species is an integral part of the outstanding marine environment described above.

The Great Australian Bight and adjacent waters are the prime habitat of the Australian sea lion. Breeding colonies occur on rocky offshore islands or coastal platforms. Only four breeding colonies (all in the state of South Australia) are known to produce more than 100 pups per breeding cycle (AFMA 2015, p. 7). Overall, the species is in a precarious state. Recent analyses have indicated a 64% decline over the last three seal-lion generations (42 years). Inscription as World Heritage of key parts of this charismatic creature's habitat would help ensure its long-term survival.

<u>The great white shark</u>
The great white shark (*Carcharodon carcharias*) travels widely and is one of the most infamous of all apex predators. Aggregation sites for the great white occur in the Bight (CSIRO et al. 2018b, p. 13), but well to the east of the proposed World Heritage property. Nevertheless, the species plays an important part in the natural processes of waters proposed for World Heritage listing.

<u>Other whales</u>
The pygmy blue whale (*Balaenoptera musculus brevicauda*) is a subspecies of the blue whale that is found in the Indian Ocean and southern Pacific Ocean. Though obviously smaller than the blue whale, it can nevertheless reach lengths of 24 metres, making it a very large creature indeed. The sperm whale (*Physeter macrocephalus*) can reach 20 metres in length and is the largest of the toothed whales. Pygmy blue whales, sperm whales and other whale species are routinely spotted in the waters of the Great Australian Bight (CSIRO et al. 2018a, pp. 23-27).

The prevalence of these large, charismatic 'flagship species' qualifies the Bight's waters under IUCN's themes for criterion (x).

5.4 An ancient relationship between indigenous people, the ocean, the land and the life forms

The Yerkala Mirning people have inhabited the Nullarbor for many millennia. Recent DNA studies have shown an Aboriginal connection to Country exceeding 50,000 years. The collective memory of these masters of survival encompasses the period before the sea rose to its current level.

Early ethnographers noted the isolation of the Yerkala Mirning people, with the inhospitable sand plains to the north and the ocean to the south. Along with the near extinction of their totemic siblings, the southern right whales, the Yerkala Mirning clans nearly disappeared in the early years of colonisation. However, Elders secretly passed down language, customs and ritual. Today the indigenous people of the property number over a thousand. They keep connection and practices strong, whether it be sharing oral stories under the stars with great-grandchildren, boiling up potent bush medicine, or standing up to protect Country. The wisdom of the Elders is held within the very word *Mirning*, meaning listen, learn, understand and observe, for then you will receive wisdom and knowledge.

The traditional *Goonminyerra*, or friendly way, is based on respect, duties and responsibilities to Country. This wisdom has been passed through generations for over 50,000 years.

The cultural landscape and seascape
The physical manifestations of Aboriginal cultural heritage within the Nullarbor include artefact scatters, stone arrangements, skeletal remains, ancient campsites, sites where flint and ochre have been mined, and rock art that includes engravings and stencils. The locations of these sites within the proposed World Heritage property have been documented in many reports (Australia 2014; Cane 1992; Clements et al. 2006; Eberhard & McBeath 2003; South Australia 2019).

Koonalda Cave, one of the Nullarbor's most celebrated features, is a large doline 60 metres across and 25 metres deep. The cave opening leads to long passages and subterranean lakes. Koonalda Cave is on the Australian National Heritage Register. It was the dating of the artwork here in 1956 that extended scientific knowledge of Aboriginal presence in Australia from 8700 years to over 22,000 years, a revolutionary idea for the times (Gallus 1971).

The markings in Koonalda are significant in their own right. 'Finger flutings' were made by drawing the fingers over the soft limestone surface of the cave, and are comparable with markings found in caves in the Garonne valley of France (Australia 2014). Other markings were made in harder rock with sharp tools. They are considered to be some of the oldest (Clements et al. 2006, p. 28) and most significant and best-preserved art of their type in Australia (South Australia 2019, p. 8). Finger fluting is one of the earliest forms of pre-historic art and found in only a handful of sites internationally. What is extraordinary here is its existence within a continuous living culture.

'The finger flutings at Koonalda Cave constitute some of the oldest and most significant rock art in Australia'

Koonalda also provides evidence of silica mining that can be reliably dated to over 20,000 years ago. Mining occurred deep in the cave (Clements et al. 2006, p. 28), an amazing feat involving exploration and, presumably, the carrying of burning torches by the area's occupants (South Australia 2019, p. 9). Trade involving silica mined at Koonalda embeds the cave in a cultural landscape whose salient features are connected by ancient tracks to places as far away as Lake Eyre / Kati Thanda and north-west Australia (South Australia 2019, p. 6). Koonalda Cave was also the first site identified in

Australia that had Aboriginal art in an area beyond the reach of natural light. Until then, recorded rock-art sites were located in naturally lit areas, such as cave entrances and overhangs (Australia 2014).

Other Nullarbor sites, such as Allen's cave, have yielded evidence of human habitation of the property to around 40,000 years and beyond, when megafauna still roamed the plains (Walshe 1994). Allen's cave also includes an abalone shell dated to 16,000 years old, a time when the cave was hundreds of kilometres from the sea. This demonstrates a human connection with the distant shoreline (Langley, Clarkson & Ulm 2019).

The cultural heritage of the Yerkala Mirning people is to be found not only at specific sites such as Koonalda and Allen's caves, but also across the entire Nullarbor landscape and seascape (Clements et al. 2006; South Australia 2019). The Mirning's creation stories tell of the ocean and its whales; the caves and their guardian creatures; the cliffs that mark the awe-inspiring edge of the Nullarbor; the ancient pathways that connect waterholes and cultural sites; and the stars of the clear night sky (Clements et al. 2006).

Early records of European people document the connection to the landscape of the Yerkala Mirning people. The celebrated journalist Daisy Bates kept detailed field notes when living on Mirning Country between 1912 and 1918 (Bates 1912-1918, p. 2; Wright 1979). She observed that, with few permanent sources of water, the clans took their identity from the waterholes and from the sea (Bates 1912-1918, Section V, 3b p2).

Bates mapped the waterholes for which each clan member was responsible, along with their totemic family of animals and plants (Bates 1912-1918, p. 43; Bates 1914). She recorded the interconnected families and their totems that include *Wanyari* (native grape or gooseberry), *Duduam* (dingo), *Koonjira* (pigface), *Woggea* (Wombat) and *Nyumbuk Dhalyi Bilia* people (seafoam, sea, Bight people) (Bates 1912-1918, pp. 2, 3, 14, 20-26, 30, 43, 44; Bates 1918a; Bates 1918b; Radcliffe-Brown 1910-1912).

Today there are over a thousand descendants of these clans. The Yirkala Mirning continue the knowledge of *Jeedara's* creation through storytelling, song and dance when calling to the southern right whales in ritual, who arrive with dramatic displays amidst the djalyi seafoam, as if affirming the ancient bonds (Kindersley & Lennon 2006).

The history of the indigenous people of the Nullarbor and Bight spans dramatic shifts in the climate and associated change in sea levels. At the height of the last ice age, 18,000 years ago, the sea level was approximately 125 metres lower than it is now, with the coast many kilometres out from today's shoreline. During these ancient times, the Mirning inhabited lands subsequently submerged by the melting of the ice (Clements et al. 2006). The Mirning's stories therefore constitute an indelible human memory of this vast history.

'We still share our stories from when the sea was young, long before the last great sea-level rise, stories of Country that is now under the waters of the Great Australian Bight'

The Mirning describe the great changes they have witnessed: 'We still share our stories from when the sea was young, long before the last great sea-level rise, stories of our land country that is now under the Great Australian Bight. When the Dutch sailed along our coast in 1627, they called our

country Landt van Pieter Nuyts. Our Elders share memories of how our ancestors met early explorers who came ashore and how they could read their thirst and hunger and so shared water and food in our *goonminyera* (friendly way)' (Mirning 2022).

The famous explorer Eyre met with clans at Head of the Bight and the Elders tell how his name 'Bunda', which now names the cliffs, came from the word for rock and the place-name '*Yeer-kumban*'. The *yeer* is a place that is *kamban*, warm, at which Eyre's party camped, protected by the sandhills from the southerly winds (Bates 1912-1918c; Eyre 1845).

The Elders carry the stories of their country below the waves and a sacred red-ochre site that is now in the middle of the sea. When pieces of ochre wash ashore, they are collected and used in ceremony. The stories of the inundation of their old homelands together with the practical skills in survival in an arid climate are within the collective wisdom of the Yerkala Mirning.

The beliefs, stories and traditions with which the landscape and seascape are imbued
For the Yerkala Mirning, the land and sea in the property follow the lines of the *Dhooghoor*, the creation story of *Jeedara*, the ancestral being who arrived in the form of a whale, and *Yargaryilya*, the Seven Sisters of the Pleiades stars. From the vastness of the *Yirrerie*, the Milky Way, *Jeedara* and *Yargaryilya* created the landforms, the animals, the plants, and their children – the Yerkala Mirning people and the whales.

Jeedara swam with *djulea*, the penguin and *wanchilya*, the dolphin, who propelled *Jeedara* through the shallows, pushing huge rocks aside, marking his underbelly.

'Jeedara, the great white whale, pushed up the cliffs and spread animals, plants, birds and sea creatures across the Country'

Jeedara continued in his path of creation, pushing up the cliffs and spreading animals, plants, sea creatures and birds across the land and sea. As he travelled, he left giant imprints, sacred places where he and *Yargaryilya* continued their courtship. Showing his great power, *Jeedara* sprayed the Seven Sisters with *djalyi*, foaming from his mouth, spout and gigantic jaws. The seafoam *djalyi* fell to the ground becoming *djaljirr*, flint for making tools, and sacred white ochre. The Seven Sisters were under his spell and gave birth to the Mirning People and their siblings, the whales (Lawrie 2018). The version recorded by Bates is closely aligned with the key elements of the more detailed myth still told by the Elders (Bates 1912-1918b; Lawrie 2018).

Some of the physical manifestations of these stories appear in the Whale Tail in the east of the property; in the west, as deposits of flint at the ancient quarry of *Kaldiyerra* (Bates 1930; O'Leary & al. 2017) near Wilson's Bluff; and in the centre, at *Miranangu*, the Head of the Bight, where whale singing occurs. Delisser, the surveyor who first named the Nullarbor Plain, recorded in the landscape at Kaldyerra 'an immense whale lies embedded here' (Delisser 1867). At *Miranangu*, the Ikula 'Morning Star' (Venus) people were located by Howitt, otherwise known as the Yerkala Mirning (Howitt 1883).

6. Protection and management

According to UNESCO, all properties inscribed on the World Heritage List must have adequate long-term legislative, regulatory, institutional and/or traditional protection. Nominated properties should also have a documented management system, such as a management plan, which specifies how the protective measures are carried out (UNESCO 2018, pp., clauses 97, 108).

The components of the proposed World Heritage property have therefore been selected to include only those parts of this vast estate that already have a high conservation-status. These include a national park, several wilderness protection areas, several marine parks in South Australian waters, and the national-park zones of three Commonwealth marine reserves. Although much of the Nullarbor and Bight occur west of the SA/WA border, only reserves on the South Australian side have been selected. This is because the South Australian government has a policy supporting World Heritage nomination for appropriate areas of the Bight.

'There is great ecological connectivity between the terrestrial reserves of the Nullarbor and the marine reserves of the coastal waters and Great Australian Bight'

In addition, the jurisdiction of SA has a number of marine reserves that fringe the coastline, creating connectivity between the terrestrial and marine components of the proposed World Heritage property. The waters of Western Australia that fringe the Nullarbor do not, as yet, have such reserves.

This approach also enables the proposal to meet the conditions of protection and management. While the proposal covers only a small proportion of the entire Nullarbor/Bight area, it is nevertheless immense, encompassing over 40,000 square kilometres of land, coastline and ocean.

As well as formal reserves, there are also policies and legislation that apply to particular species of importance to the proposal, and these measures are listed as well.

The reserves within the proposal are as follows.

6.1. Terrestrial reserves (not counting the islands)

Reserve	**IUCN category**	**Jurisdiction**	**Area (ha)**
Core			
Nullarbor Wilderness Protection Area	1b	SA	894,245
Nullarbor National Park	VI	SA	32,289
Sub-total			**926,534**
Additional areas			
Wahgunyah Conservation Park (part)	VI	SA	< 48,000
Yalata Indigenous Protected Area (part)	V		< 464,397
Private Heritage Agreement Land	III	SA	< 1,500
Total			**< 1,400,000**

The table identifies the core of the proposal (the Nullarbor WPA and national park) as well as other areas, parts of which could potentially be added subject to negotiations with Traditional Owners, other owners and other key stakeholders.

The publicly-owned reserves of that part of the Nullarbor that occurs under the jurisdiction of the Government of South Australia are managed under the Nullarbor Parks Management Plan (South Australia 2019). As well as the Bunda Cliffs and large parts of the Nullarbor karst, the reserves also protect 20 rare or threatened species of fauna, including the southern hairy-nosed wombat; 19 rare or threatened species of flora; and caves whose cultural heritage is highly significant to the Yerkala Mirning people, including Koonalda Cave (p.8).

The objectives of management in the plan include:

- Protection of the Nullarbor parks' natural values and rich Aboriginal cultural heritage, as well as the area's non-Aboriginal heritage.
- Management of outbreaks of exotic weeds and feral fauna.
- Recovery of threatened species of native flora and fauna.
- Implementation of a fire-management strategy aimed at protecting local flora, fauna and cultural heritage.
- Collaboration with the Yerkala Mirning and other far west coast Aboriginal people.
- Responses to the impacts of climate change.

There are specific measures that apply to cultural heritage and the involvement of the Traditional Owners within the Nullarbor parks. They are managed with advice from the Nullarbor Parks Advisory Committee, which provides the Yerkala Mirning people with a central role in setting directions for the management of the parks. The ongoing involvement of Yerkala Mirning people and other Aboriginal people of South Australia's far west coast will ensure that their cultural knowledge is used as a foundation for future management (South Australia 2019, p. 4).

Numerous significant sites for Aboriginal tradition, archaeology, anthropology and history occur within the Nullarbor parks. All sites are protected under the *Aboriginal Heritage Act 1988* whether registered, unregistered or not yet recorded. The Nullarbor parks remain subject to rights and interests of native-title owners that persist in relation to the land. The plan will be implemented in accordance with the relevant provisions of the *Native Title Act 1993* and Native Title determinations for the property.

6.2. Marine reserves (including the islands)

Australia has established an array of marine reserves that are part of a national representative system of marine protected areas. Many of these reserves are in waters under the jurisdictions of state governments; the rest are in waters whose management is the responsibility of the Australian government, known as Commonwealth waters.

6.2.1. South Australian waters

The table below identifies the reserves under South Australian (SA) jurisdiction that comprise the marine component of the proposed property (including land on several small island).

Reserve	IUCN Category	Jurisdiction	Area (ha)
Marine reserves			
Far West Coast Marine Park	Varied	SA	169,000
Nuyts Archipelago Marine Park	Varied	SA	399,800
West Coast Bays Marine Park	Varied	SA	78,900
Investigator Marine Park	Varied	SA	118,500
Island reserves (terrestrial)			
Nuyts Archipelago Wilderness Protection Area	1b	SA	2,462
Investigator Group Wilderness Protection Area	1b	SA	440
Nuyts Reef Conservation Park	1a	SA	47
Nuyts Archipelago Conservation Park	1a	SA	8,862
Sinclair Island Conservation Park	1a	SA	3
Cap Island Conservation Park	1a	SA	9
Total			**778,023**

The four marine parks (Far West Coast, Nuyts Archipelago, West Coast Bays and Investigator Group) provide important connectivity between terrestrial reserves, the coast, inshore waters, islands and larger tracts of the open ocean.

Management plans for these marine parks were developed after extensive public consultation and have established zoning schemes and management strategies for each park. The plans provide for the protection of biodiversity, life-sustaining ecological processes, natural heritage and cultural heritage (both European and Aboriginal), as well as providing for ecologically sustainable use. The sanctuary zones have an extremely high protection status.

The marine parks' zones and objectives are as follows:

- *General Managed Use Zones (GMUZ)* enable areas to be managed to protect habitats and biodiversity, while allowing ecologically sustainable development and use.
- *Habitat Protection Zones (HPZ)* enable areas to be managed to protect habitats and biodiversity, while allowing for activities that do not harm habitats or the functioning of ecosystems.
- *Sanctuary Zones (SZ)* enable areas to be managed to protect and conserve habitats and biodiversity, especially by prohibiting the removal or harm of plants, animals or marine products.
- *Restricted Access Zones (RAZ)* enable areas to be managed by limiting access to them.

It is intended that the World Heritage property, if inscribed, would retain the zoning provided in the plans. The Mirning and Wirangu Aboriginal peoples have traditional associations with sections of these marine parks.

'It is intended that the World Heritage property would retain the zoning provided in current management plans'

Technically, the two wilderness-protection areas listed here are terrestrial reserves but they are included amongst the marine reserves because they are small islands that occur in an oceanic setting.

Wilderness protection areas in South Australia are managed according to a code of management whose objectives are to protect wilderness quality, wildlife, ecological processes, geographic features, and Aboriginal cultural heritage (Department for Environment and Heritage 1992). Provision is made for public use of the reserve where such uses are compatible with maximising wilderness quality. The remoteness of these islands from the mainland provides a secure refuge for small mammals that would otherwise be threatened by introduced predators. To protect these critical island habitats from disturbance, all are protected to the low-water mark, and unauthorised access is not permitted.

The World Heritage proposal contains other small islands that are conservation parks – a lower conservation status than wilderness-protection areas. They are managed under the 2006 management plan for the island parks of the Western Eyre Peninsula (Department for Environment and Heritage 2006). These islands are embedded within the area of the World Heritage proposal and help contribute to its Outstanding Universal Value and integrity. It is proposed that the management prescriptions applying under the 2006 plan remain in place.

6.2.2. Commonwealth waters

Australian marine parks (Commonwealth reserves proclaimed under the EPBC Act in 2007 and 2013) are located in Commonwealth waters that start at the outer edge of state and territory waters, generally three nautical miles (approximately 5.5 km) from the shore and extend to the outer boundary of Australia's exclusive economic zone, 200 nautical miles (approximately 370 km) from the shore.

The table below identifies those parts of the reserves under Commonwealth jurisdiction that are relevant to the marine component of the proposed property. These reserves encompass much larger areas of ocean than do the South Australian reserves. Note that only those parts of these reserves within highly-protected zones are part of the World Heritage proposal.

Reserve Zone	**IUCN Category**	**Area (ha)**
Western Eyre Marine Park – national-park zone 3 (swweynpz03)	II	64,542
Western Eyre Marine Park – national-park zone 4 (swweynpz04)	II	111,542
Murat Marine Park – entire reserve zoned as national park	II	93,800
Great Australian Bight Marine Park – national park zone 2 (swgabnpz02)	II	772,800
Great Australian Bight Marine Park – special purpose management mining exclusion zones 1 and 3 (swgabspm01 and swgabspm02)	VI	1,165,400
Total		2,208,084

Underpinning the management of the Commonwealth marine reserves is Australia's Environment Protection and Biodiversity Conservation Act 1999 ('the EPBC Act'). Under the EPBC Act, Australia's primary environmental legislation, the marine environment is listed as a matter of national environmental significance. Other parts of the Australian Government must not perform functions or exercise powers in relation to these parks that are inconsistent with management plans.

A single management plan – the *South-west Marine Parks Network Management Plan 2018* ('the plan') – applies to this network of reserves, and therefore to each Commonwealth marine park relevant to the proposed World Heritage property (Director of National Parks 2018). The plan was finalised in 2018 after a long period of community consultation.

The objectives of the plan are to:
a) protect and conserve biodiversity and other natural, cultural and heritage values of marine parks in the South-west Network; and
b) enable the ecologically sustainable use and enjoyment of the natural resources within marine parks in the South-west Network, where this is consistent with objective (a). (p. 8)

The marine parks have been zoned to provide for different levels of protection and use. The proposed World Heritage property contains areas zoned as national park and one special-purpose management zone, within the Great Australian Bight Marine Park (elaborated on below). Within the national-park zones, commercial fishing, recreational fishing, aquaculture and mining are prohibited.

When it comes to the marine component of the cultural heritage, the applicable management plan recognises and enshrines the role and rights of the traditional owners (Director of National Parks 2018, pages 8, 11-14, 96, 98, 102).

In addition to the above instruments of government, there is also the continued custodianship of the Yerkala Mirning people. Generations of Mirning have continued communion, care and protection of sacred places and totemic animals, each having a respected place within the on-going manifestation of the *Dhooghoor*, Creation. This is a culture whose people remember and respect the traditions of their ancestors. The property's OUV today bears witness to the protection provided by thousands of generations caring for Country**.**

6.3. Measures for managing particular species of importance to the proposed property

In addition to a national system of reserves, Australia has laws, policies and management plans that aim to protect species such as sea lions and whales wherever they may occur in Australian waters. Australia is also a signatory to various international instruments aimed at protecting cetaceans. The implementation of associated measures to protect the Australian populations of such species enhances the viability of flagship species within this proposed World Heritage property. Some of these measures are as follows.

International arrangements
Australia is a signatory to the International Convention for the Regulation of Whaling and has been an active advocate for the protection of whales globally. It is also a member state of the CMS Memorandum of Understanding for the Conservation of Cetaceans and their Habitats in the Pacific Islands Region.

The Environment Protection Biodiversity Conservation Act 1999 (EPBC Act)
The EPBC Act established the Australian Whale Sanctuary and gives high levels of protection to cetaceans in Commonwealth waters. The Australian Whale Sanctuary encompasses the area of the Australian Exclusive Economic Zone (EEZ) outside state waters and generally extends 200 nautical miles from the coast but further in some areas to cover the continental shelf and slope. Within the Australian Whale Sanctuary, it is an offence to kill, injure, take, trade, keep, move or interfere with a cetacean.

The EPBC Act also includes measures aimed at protecting endangered species that occur within the proposed World Heritage property, including the southern hairy-nosed wombat, the great white shark, the southern right whale and the Australian sea lion. Dedicated management strategies for the latter two species are described below.

South Australian Legislation
In addition to its system of reserves, the South Australian Government has declared a whale sanctuary at the Head of the Bight, a significant aggregation and calving area. This declaration permanently excludes activities that are disruptive to habitat, and/or have the potential to conflict with whales. Mining is prohibited within conservation zones in state waters. Southern right whales are listed as vulnerable under South Australian legislation. Regulations protecting marine mammals can be found within the *South Australian National Parks and Wildlife Act 1972*. (Australian Government 2012, p. 16)

Conservation Management Plan for the Southern Right Whale (CMPSRW)
The CMPSRW was developed under the EPBC Act to enable recovery of the populations of the southern right whale in Australian waters. It also gives effect to Australia's international obligations under the arrangement identified above. Actions in the plan not already described here include (Australian Government 2012):

- Assessing and addressing threats to the whale that include anthropogenic noise, collisions with vessels, and climate change;
- Developing a fishing-industry code of conduct to reduce entanglements;
- Addressing the impacts of infrastructure and coastal development.

The Australian Sea Lion Management Strategy (ASLMS)
Australian sea lions have been assessed to be at high risk from the impacts of gillnet fishing. The ASLMS was implemented in 2010 to implement Australia's obligations to the Australian sea lion under the EPBC Act and the Fisheries Management Act. Since 2013, measures put in place by the ASLMS include (AFMA 2015):

- Prevention of the use of gillnets around all colonies of the Australian sea lion in South Australian waters. This covers an area of 18,500 square kilometres.
- Monitoring of 100% of all gillnet fishing in South Australian waters through independent onboard observers or electronic means.
- The setting of limits on the mortality of Australian sea lions in order to trigger additional closures if limits are exceeded.
- Continuing reviews of fishing practices, including allowing eligible gillnet operators to use hook fishing instead of gillnets.
- Additional measures that include education programs, identification guides, restrictions on industry equipment designed to reduce bycatch, and an industry code of practice.

The ASLMS says that mortality of the Australian sea lion has been reduced as a result of the implementation of these measures.

According to very recent studies, the measures introduced by AFMA have been very successful, with an estimated 98% reduction in bycatch mortality of the Australian sea lion within its management zone off South Australia and an almost complete transition from gillnet to long-lines over the last decade (Goldsworthy, Simon David et al. 2022; Goldsworthy, Simon D et al. 2021).

<u>6.4 Measures for managing culture</u>

The United Nations Convention on the Rights of the Child (CRC)
In addition to the local heritage protections, Australia ratified the CRC on 17 December 1990.

Article 30: In those States in which ethnic, religious or linguistic minorities or persons of indigenous origin exist, a child belonging to such a minority or who is indigenous shall not be denied the right, in

community with other members of his or her group, to enjoy his or her own culture, to profess and practise his or her own religion, or to use his or her own language.

Article 8: 1. States Parties undertake to respect the right of the child to preserve his or her identity, including nationality, name and family relations as recognized by law without unlawful interference. 2. Where a child is illegally deprived of some or all of the elements of his or her identity, States Parties shall provide appropriate assistance and protection, with a view to re-establishing speedily his or her identity.

7. Conditions of integrity and authenticity

All properties inscribed on the World Heritage List must satisfy the conditions for integrity. In addition, those inscribed for cultural values must also satisfy conditions for authenticity.

The Operational Guidelines for the World Heritage Convention (UNESCO 2018) describe 'integrity' as it pertains to a World Heritage property as follows:

Integrity is a measure of the wholeness and intactness of the natural and/or cultural heritage and its attributes. Examining the conditions of integrity, therefore requires assessing the extent to which the property:
a) includes all elements necessary to express its Outstanding Universal Value;
b) is of adequate size to ensure the complete representation of the features and processes which convey the property's significance;
c) suffers from adverse effects of development and/or neglect.

This should be presented in a statement of integrity.

The ways in which the proposed World Heritage property satisfy the conditions for integrity and/or authenticity are outlined for natural heritage in Section 7.1 and for cultural heritage in 7.2 below.

7.1. Integrity and Natural Heritage

Karst and sea cliffs

The South Australian Nullarbor reserves that constitute the karst section of this proposal contain over 920,000 ha of land, including numerous spectacular caves such as Allens, Bildoolja, Koomooloobooka, Koonalda, Lindsay Hall, Murrawijinie, Warbla, Weekes and Wigunda. Between them, these caves and many others in this vast landscape contain subterranean lakes, exquisite speleothems, fossils of Tasmanian devils and thylacines, an archive of formations extending back into deep time (Woodhead et al. 2019), and several caves containing troglobitic fauna. The protected areas of the property are therefore big enough to ensure protection of key attributes and the unimpeded continuation of the evolutionary processes responsible for the karst system.

When it comes to ancient and/or spectacular features of the landscape, the entire Nullarbor region represents an ancient seafloor uplifted due to gradual tilting of the Australian continent. Palaeo-shorelines from the Miocene epoch are preserved in the northeast of the Wilderness Protection Area and the Bunda Cliffs are contained almost wholly within the proposed property.

The terrestrial component of the proposal, which occupies between 900,000 and 1.4 million ha, also ensures adequate representation of sweeping vistas; scenic contrasts between plains, cave entrances and cliffs; and the habitat of species such as the southern hairy-nosed wombat.

The marine environment

With nearly 30,000 square kilometres of ocean in various settings and at various depths, the proposed property contains vast seascapes and marine habitats. The tracts of open ocean contain seascapes of great power, with ocean swells and currents. These parks extend from the intertidal zone in coastal areas to depths of over 100 metres. The Great Australian Bight Marine Park national-park zone extends to 50 km from the shore and the Murat Marine Park occurs between 30 and 70 km offshore. These great expanses of marine park have sufficient size to contain significant sections of the world's longest zonal continental shelf and the interactions between ocean swells, ocean

currents, adjacent landforms and submarine features. The reserves within the proposal contain sections of the Great Australian Bight Shelf Transition, with its gradual slope across the continental shelf from shallow inshore waters to depths greater than 100 metres. Aggregations of sea creatures occur regularly within the protected marine areas of the proposal.

The protected areas surrounding most of the islands and reefs of the Nuyts and Investigator archipelagos encompass those areas' diverse marine habitats and scenery, including the lagoons, estuaries, seagrass meadows and mangroves. The islands themselves are mostly covered by wilderness-protection legislation. There is substantial connectivity between the reserves in Commonwealth waters and those in waters under the jurisdiction of the SA government. The SA state marine parks contain complete networks of habitats, including islands, intertidal rock platforms, shallow bays, seagrass meadows, estuaries and mangroves, resulting in a high diversity of species. The reserves contain shark nurseries, haul-out rocks for pinnipeds, shallow areas of seagrass and vast areas of benthic zone within the Great Australian Bight Transition. Additional habitats well represented within the proposal include those for gastropods, corals, sponges, sea stars, pelagic fish (such as sharks) and seabirds. The benthic invertebrate communities of the eastern part of the Bight, which form some of the world's most diverse soft-sediment ecosystems, are well represented within the Commonwealth marine-park zones contained within the proposal.

The extensive marine reserves protect important habitat for the endangered southern right whale. The species is still recovering from near extinction due to commercial whaling, and its population stands at less than 20% of pre-whaling abundance. The proposed World Heritage property contains Commonwealth-recognised Biologically Important Areas for breeding, calving, resting, mating and migrating southern right whales, including Australia's largest aggregation at the Head of the Bight where whales are protected by the Marine Mammal Protection Area of the Great Australian Bight Marine Reserve, and an adjacent aggregation area at Fowlers Bay.

The proposed property also contains breeding sites for the Australian sea lion that are closed to gillnet fishing as well as several important haul-out sites (rock platforms at the foot of the Bunda Cliffs and within island reserves included within the proposed World Heritage property, including Nuyts Reef). The proposed property encompasses important habitat for numerous flagship species, such as baleen whales (such as southern right whale, pygmy blue, fin and humpback whales) and toothed whales (such as sperm, beaked and killer whales), the great white shark and the Australian sea lion. These species also enjoy the protection conferred by the EPBC Act and SA legislation.

The Great Australian Bight Marine Park, in particular, supports foraging habitat for seabirds, Australian sea lions, white sharks, pygmy blue whales and sperm whales, and a calving area, migratory pathway, and large aggregation area for southern right whales. The Great Australian Bight Marine Park contains a Marine Mammal Protection Zone in the head of the Bight which is closed from 1 May to 31 October every year. The park also contains ancient coastline between 90 m and 120 m depth where high benthic biodiversity occurs.

The Murat Marine Park (MMP) contains ecosystems associated with the 'shelf transition' of the Bight – a vast, shallow and flat part of the seabed. Its invertebrate benthic communities are among the most diverse in the world. The small pelagic fish of the reserve provide an important link between plankton communities and larger fish-eating predators. The MMP is a hotspot for feeding aggregations of marine mammals, sharks and seabirds (Director of National Parks 2018, pp. 98-100).

Conditions of authenticity and integrity pertaining to cultural heritage

Authenticity

All World Heritage properties inscribed for cultural heritage must satisfy the conditions for authenticity. UNESCO (2018, clauses 30-84 and Annex 4), says that examinations of authenticity require cultural sensitivity as well as credible sources of information. Feeling and spirit, while subjective, are an important part of identifying cultural heritage, particularly when involving communities attempting to maintain tradition and cultural continuity. Use of all relevant physical, written, oral and figurative sources is valid.

The authenticity of the occupation of the Nullarbor by the Mirning is beyond question and has been documented by specialist scholars (Clements et al. 2006) and government (Australia 2014; South Australia 2019). The accounts of Bates between 1912 and 1930 make clear the historical connection between the Yerkala Mirning and the attributes of the landscape of the Nullarbor and its coast (Bates 1912-1918; Bates 1914, 1918a; Bates 1918b, 1930).

The antiquity of the finger flutings of Koonalda Cave is beyond question, having been prominently established since the 1950s (Australia 2014; Clements et al. 2006; Gallus 1971 ; South Australia 2019). Relevant cultural heritage at other sites in the proposed property has also been documented by many authorities (Cane 1992, Appendix 2; Eberhard & McBeath 2003; South Australia 2019).

The oral histories held by the Elders appear in the colonial ethnographic historical documents. There are more recent records of the Mirning people's continuing efforts to protect Country and their spiritual connection with the whales. The traditional law of continuity through coastal bloodline descent is seen in the current generations who trace their ancestry back pre-colonisation to their clan country in the property. All of this is within an astonishing landscape that defies time and space and yet is carried in the hearts of the Yerkala Mirning.

The proposed property therefore satisfies UNESCO's conditions of authenticity.

Integrity

The property, whose terrestrial component encompasses well over 9000 square kilometres, is sufficiently vast to contain the key components of the cultural landscape. These extend from the men's sacred creation stories west of the Head of the Bight, to the women's sacred stories and sites to the east. The World Heritage proposal extends from the dramatic Whale Tail and continues to the birthplace of the Mirning people at Moodeyerra. The landscape takes in the softer mallee woodlands of women's country and the vast Nullarbor that greets the sky and nestles hidden karsts and caves of men's country. The property includes the ancestral submerged homelands that are now the birthing place of the whales. Despite the last 200 years of colonisation, this is the heartland of an ancient people that still treasures belonging with Country and totemic creatures and plants.

The proposed property contains Koonalda and Murrawiginie caves with their rock art (South Australia 2019); numerous other caves and cultural sites such as artefact scatters (Cane 1992); over 200 km of coastline; the Head of the Bight, with its crucial whale-aggregation area (Director of National Parks 2018); large tracts of the Nullarbor ecosystem, with its habitat of totem creatures such as wombats, dingoes and bush food; and expanses of ocean that are sufficient to encompass critical attributes of the broader cultural seascape, including the submerged areas that form part of the collective memory of the Yerkala Mirning.

UNESCO's condition of integrity is therefore satisfied when it comes to the indigenous cultural heritage of the proposed World Heritage property.

Appendix 1 – World Heritage and Outstanding Universal Value

The World Heritage Convention has established a governing body, the World Heritage Committee, for determining which sites should be inscribed on the World Heritage List. That Committee has, in turn, established Operational Guidelines that set out the criteria for Outstanding Universal Value (UNESCO 2018):

77. The Committee considers a property as having Outstanding Universal Value … if the property meets one or more of the following criteria. Nominated properties shall therefore:

(i) represent a masterpiece of human creative genius;

(ii) exhibit an important interchange of human values, over a span of time or within a cultural area of the world, on developments in architecture or technology, monumental arts, town-planning or landscape design;

(iii) bear a unique or at least exceptional testimony to a cultural tradition or to a civilization which is living or which has disappeared;

(iv) be an outstanding example of a type of building, architectural or technological ensemble or landscape which illustrates (a) significant stage(s) in human history;

(v) be an outstanding example of a traditional human settlement, land-use, or sea-use which is representative of a culture (or cultures), or human interaction with the environment especially when it has become vulnerable under the impact of irreversible change;

(vi) be directly or tangibly associated with events or living traditions, with ideas, or with beliefs, with artistic and literary works of outstanding universal significance. (The Committee considers that this criterion should preferably be used in conjunction with other criteria);

(vii) contain superlative natural phenomena or areas of exceptional natural beauty and aesthetic importance;

(viii) be outstanding examples representing major stages of earth's history, including the record of life, significant on-going geological processes in the development of landforms, or significant geomorphic or physiographic features;

(ix) be outstanding examples representing significant on-going ecological and biological processes in the evolution and development of terrestrial, fresh water, coastal and marine ecosystems and communities of plants and animals;

(x) contain the most important and significant natural habitats for in-situ conservation of biological diversity, including those containing threatened species of Outstanding Universal Value from the point of view of science or conservation.

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