

Ediacara Conservation Park

Management Plan 2012



Protecting an internationally significant fossil assemblage; discovery site of the now globally recognised fossils of the Ediacaran Period.



**Government
of South Australia**

Department of Environment,
Water and Natural Resources

www.environment.sa.gov.au

Minister's foreword



The fossils of Ediacara Conservation Park are of international significance and tell a fascinating story about our geological past. The Adnyamathanha

people are the traditional owners of this outback landscape and their stories tell how fossils in the rocks were created. The name 'Ediacara' is derived from these stories.

Reginald Sprigg AO, a celebrated conservationist and geologist, uncovered another layer to these stories in the 1940s when he studied fossils that would later be recognised as the oldest known evidence of multi-celled life on Earth. In 1958, this area became a fossil reserve and in 2004, the international significance of the fossils at this site was recognised through the listing of a new geological period called the Ediacaran Period. In 2007, the Ediacara Conservation Park was proclaimed in recognition of this area's significance.

This management plan was prepared with advice from the Flinders Ranges National Park Co-management Board, and in consultation with many individuals and groups, including Adnyamathanha traditional owners, park neighbours and the South Australian Museum.

I thank all those who have contributed to the development of this management plan and acknowledge the efforts of park neighbours and others who continue to support the protection of this park.

I now formally adopt this management plan for the Ediacara Conservation Park under section 38 of the *National Parks and Wildlife Act 1972*.

A handwritten signature in black ink, appearing to read 'Paul Caica'. The signature is fluid and cursive, written over a textured orange background that resembles a rock surface.

The Hon Paul Caica MP
Minister for Sustainability,
Environment and Conservation





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Directions for management

Ediacara Conservation Park protects an internationally significant fossil assemblage, representing the first fossilised remains of a community of soft-bodied Ediacaran organisms not found in such abundance anywhere in the world. These fossils are 540 to 580 million years old and as the first known radiation of multicellular animal life, they have given scientists a new understanding of the evolution of life on earth.

The *Ediacara Conservation Park Management Plan* provides direction for how we manage this park into the future. The plan was prepared in consultation with experts from the South Australian Museum, park neighbours, and the Adnyamathanha people, who are the recognised traditional owners and Native Title holders of the land and waters of Ediacara Conservation Park. Through this process a shared vision has been identified and management strategies established. The Department of Environment, Water and Natural Resources (DEWNR) will co-ordinate the prioritisation and implementation of these strategies on an annual basis.

Three broad management themes have been identified:

- Protecting internationally significant fossils by carefully managing visitor use and access to the park;
- Conserving the cultural and natural values of the park; and
- Managing risk associated with past mining activities and providing or responsible exploration and mining in the future.

This management plan was adopted on 30 October 2012.

This management plan meets the requirements of section 38 of the *National Parks and Wildlife Act 1972*.

Park significance and purpose

Protection of Ediacara Conservation Park begins with understanding its significance.

Ediacara Conservation Park, proclaimed in 2007, is located in the Northern Flinders district of South Australia, east of Lake Torrens (Figure 1).

The 2,224 hectare park occurs within the vast expanse of land traditionally associated with the Adnyamathanha people. The name Ediacara is derived from the *Yura Muda* (history story) and the Adnyamathanha name *lthiaka-na-danha*, where *lthi* means 'Zebra Finch' and *aka-na-danha* means 'to come out'. The park contains several features associated with this story, which are of considerable significance to members of the Adnyamathanha community. There are former camping and ritual places scattered throughout the area and stories also exist that explain the fossils in the rocks, demonstrating the rich cultural heritage requiring protection.

The park plays a vital role in conserving a unique, diverse, and well-preserved assemblage of fossilised soft-bodied Ediacaran organisms that date back 540 to 580 million years. The park is internationally significant as it is the discovery site of the now globally-recognised fossils of the Ediacaran biota.

In the Flinders Ranges, Ediacaran fossils are confined to the fossil-rich Ediacara Member of the Rawnsley Quartzite. In some parts of the park this has become exposed as thin flagstones in bands of outcrop that almost circumscribe the park. Natural casts and moulds of soft-bodied creatures have been revealed that appear to be distant ancestors of sponges, sea slugs, crabs, starfish, jellyfish, worms, sea urchins and soft corals.





The fossils represent the first fossilised remains of a community of soft-bodied organisms not found in such abundance anywhere in the world. They demonstrate the first known radiation of multicellular animal life during what is now referred to as the Ediacaran period, which has given scientists a new understanding of the evolution of life on earth (Geoscience Australia, 2007).

These fossils, in turn, have given the name "Ediacara" to the first geological time period to be recognised in the last 120 years and the first based in the southern hemisphere: the *Ediacaran Period and System*, as defined near the Brachina Gorge in the Flinders Ranges National Park in 2004.

Ediacara Conservation Park is valuable scientifically for being the type locality for the fossils of the Ediacaran biota in general, and in particular for the majority of named iconic taxa of the Ediacaran biota. Forms such as *Dickinsonia*, *Spriggina*, *Parvancorina*, *Kimberella* and *Tribrachidium* are now known world-wide. It is also valued for the evidence it preserves of the nature of the marine environment in which these organisms thrived and for the evidence of how soft-bodied animals could be preserved as casts and moulds. It is valuable as a place where Ediacaran fossils can be shown to be older than fossils of animals with varied mineral hard parts, namely Cambrian fossils.

The park also protects significant mining history. The area became well known in the latter part of the 1880s when several mining companies began operations in the Ediacara mineral field. The extraction of mostly lead-silver ore deposits continued until 1918. Today the remnants of this mining history can be seen, including a number of ruins and abandoned mine shafts scattered throughout the park.

The natural environment of Ediacara Conservation Park contains a semi-arid matrix of sparsely distributed chenopod (*Atriplex* and *Maireana* spp.) shrubland, interspersed with Umbrella Bush (*Acacia ligulata*) and Narrow-leaf Hop-bush (*Dodonaea viscosa* ssp. *angustissima*) tall open shrubland, and Mulga (*Acacia aneura*) very low open woodland. A detailed assessment of vegetation and fauna has not been undertaken.

The *South Australian Arid Lands Biodiversity Strategy: Flinders and Olary Ranges Conservation Priorities* (2009) identifies chenopod shrubland as important habitat for two nationally threatened bird species: the Thick-billed Grasswren (*Amytornis textilis modestus*) and the Slender-billed Thornbill (*Acanthiza iredalei iredalei*). The strategy also reports that the lower ranges and hills of the region may support significant and endemic plant species.



Spriggina flouderesi



Parvancorina minchami



Dickinsonia costata

What are we protecting?

Ediacara Conservation Park was proclaimed to conserve an area containing an internationally significant fossil assemblage.

The park has the following values:

- Conserves a unique, diverse, and well-preserved assemblage of fossilised Ediacaran soft-bodied marine organisms of international importance, enabling research and education into the future;
- Protects places of significance and parts of the landscape associated with *Yura Muda* stories of the Adnyamathanha people;
- Protects remnants of mining history associated with the Ediacara mineral field, including a number of ruins and abandoned mine shafts; and
- Conserves important chenopod habitat.

What are the challenges?

The main challenges for conserving the values of Ediacara Conservation Park are:

- Preventing the damage and/or the illegal removal and destruction of fossils;
- Minimising any impacts associated with stock grazing;
- Minimising public safety risks associated with historic mine shafts; and
- Improving knowledge about the fossils, native flora and fauna, and springs and soaks that exist within the park to ensure their adequate conservation.



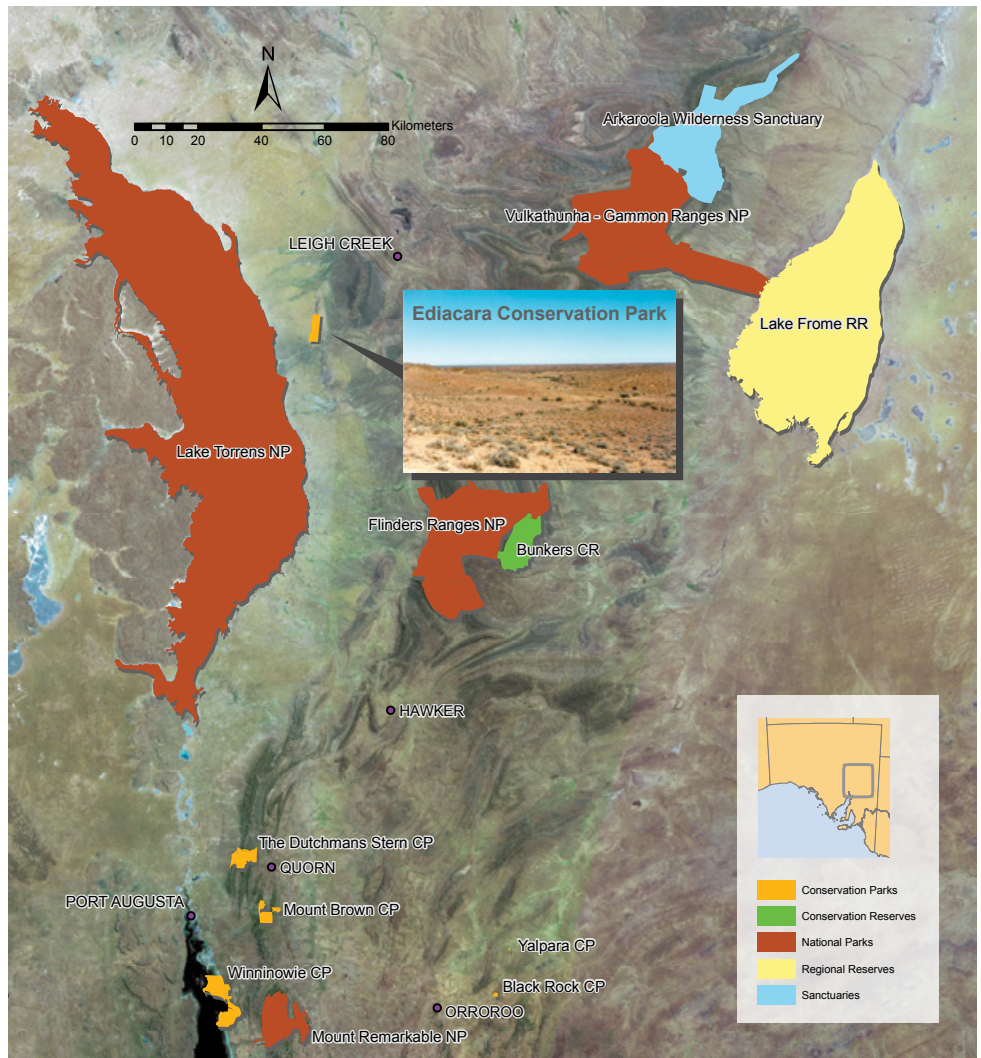


Figure 1

Setting the management direction

Developing management themes and strategies will enable actions for protection of the unique values of the park.

Ediacara Conservation Park will be managed to protect an assemblage of internationally significant Ediacaran fossils and their geological context, enabling research and education into the future, whilst conserving remnants of mining history and sensitively managing mining activities into the future.

The Adnyamathanha people are the traditional owners of a large area in and around the Flinders Ranges, including the land and waters comprising Ediacara Conservation Park. This management plan recognises that Native Title rights and interests exist over the park. All activities in the park will be undertaken in accordance with the relevant provisions of the *Native Title Act 1993*. This includes notification and consultation with the Adnyamathanha Traditional Lands Association which is the prescribed body corporate under this Act in respect to the park.

A Co-management Agreement (CMA) and Indigenous Land Use Agreement have been entered into over the Flinders Ranges National Park. Under the CMA, a Co-management Board has been established for the management of the Flinders Ranges National Park. The Board also has an advisory role to the Minister and Director of National Parks and Wildlife with respect to the management of Ediacara Conservation Park.



Management themes and priorities

This section of the plan discusses the important issues within each theme and sets out objectives and strategies for management

Theme 1: Protecting internationally significant fossils by carefully managing visitor use and access to the park

Ediacara Conservation Park preserves a unique and internationally significant assemblage of fossilised soft-bodied Ediacaran organisms that date back 540 to 580 million years.

The Ediacaran fossils are valuable to scientists in museums and universities. In the past they have been damaged and removed by both amateur and commercial collectors to be sold nationally and internationally, including on the black market. Fossil excavation and removal has the potential to modify the natural landscape, permanently alter the structure of geological features and negate the inherent value of the *in situ* fossil assemblage. The geological context in which they are located provides important references for understanding the history of life on earth, and when removed or damaged, much of their value to science is lost.

Substantial damage to Ediacaran fossil beds has already occurred and preventing further disturbance and illegal removal remains a key management objective. Regulating access to the park, together with strategies outlined elsewhere in the plan, will ensure their ongoing protection.

The responsible collection and study of fossils by public museums and associated research institutions remains important. The Ediacara fossil site is recognised as an important type area for the best known taxa of fossils of the Ediacaran biota and type section for the Ediacara Member. On occasion DEWNR may need to consider the relocation of fossils to the South Australian Museum or other secure repositories to ensure their protection from theft or eroding processes. The controlled excavation and on-site layout of reassembled fossil seafloors for the purposes of scientific research and interpretation may also be considered as part of the overall management and interpretation strategies for the park.

Ediacara Conservation Park receives a small number of visitors each year, including geologists, palaeontologists, student groups and conference excursions with an interest in palaeobiology, as well as tourists with a general interest. The current and proposed management of park visitors, and the current absence of visitor facilities, is aimed at carefully managing access to the park to ensure protection of fossil sites remains a priority.

The risk of damage and disturbance to fossil beds would be decreased if the needs of some of these park visitors could be provided for at an alternative location through interpretive displays and/or educational material. While the region contains the National Heritage-listed *Ediacara Fossil Site – Nilpena* and the Flinders Ranges National Park contains the location where the *Ediacaran Period and System* is defined, it is recognised that there is value in developing an interpretive site closer to the original fossil location. This would be in addition to the already established display on Ediacaran fossils at the South Australian Museum.

Applications for access to the park need to be carefully considered. The Adnyamathanha traditional owners will be notified via the Flinders Ranges National Park Co-management Board of any relevant applications for park access.

The fossil sites within Ediacara Conservation Park are protected as a State Heritage Place under the *Heritage Places Act 1993*. Any development of a State Heritage Place is subject to the heritage provisions of the *Development Act 1993*. Any excavation, disturbance and removal of specimens requires specific permission from the Director of National Parks and Wildlife under the *National Parks and Wildlife Act 1972*. If any research is to be undertaken in the park it must also be carried out with a Scientific Research Permit approved by the Director of National Parks and Wildlife under the *National Parks and Wildlife Act 1972*. The Director may also set conditions that must be carried out relating to scientific fossil research and access to the park. These conditions can be found at the back of this plan.

Objectives and Strategies

Manage visitor access to protect the fossil assemblage within the park

- Applications for park access by researchers and other visitors will be considered when each of the following criteria have been met:
 - Travel through adjacent pastoral leases has been granted by the lessee
 - The application is supported by the South Australian Museum
 - There are no significant risks to park values
 - Applicants have strategies or conditions in place to minimise impact (such as visiting with the guidance of an appropriately experienced person).
- Continue to liaise and foster working relationships with the South Australian Museum and the Beltana and Nilpena pastoral lessees to cooperatively manage access arrangements for Ediacara Conservation Park
- Notify the Flinders Ranges National Park Co-management Board of any relevant applications for park access
- Investigate options for establishing an interpretive site at an alternative location where visitors can view fossils without impacting on the fossils within the park
- Responsibly manage sustainable fossil research and the conservation of fossil records through departmental policies, the Scientific Research Permit system, and through ongoing liaison with the South Australian Museum
- Ensure appropriate signs are erected at key access points to clearly indicate that entry is by permission only, and with contact details for arranging access

Theme 2: Conserving the cultural and natural values of the park

Ediacara Conservation Park protects a range of cultural and natural values, including those of significance to the Adnyamathanha community and remnants of historic mining activity. The park may also protect threatened plant species or ecological communities, and habitat for threatened fauna. These values, together with important fossil locations, are sensitive to disturbance and erosion and require management to ensure their conservation into the future.

The land comprising Ediacara Conservation Park contains several features associated with stories of significance to the Adnyamathanha community, which extend throughout the landscape. Important places and values will be conserved and protected in consultation with Adnyamathanha traditional owners, including springs and soaks.

Following the discovery of silver in the Northern Flinders Ranges in 1869, real interest in the silver deposits began to be shown in the early 1880s. One of the best known and most successful was the Ediacara mineral field (within Ediacara Conservation Park), which had also been worked for copper for more than 16 years (Klaassen, 1991). During the latter part of the 1880s and during the 1890s numerous companies started to work the Ediacara mineral field, mining lead-silver ore deposits located in the Early Cambrian rock strata overlying the Ediacara Fossil Member on the west and southern sides of the park. Mine workings including smelters, mills, dwellings and associated buildings occupied the north-west area of the park.





By 1918 the Ediacara mineral field finally demised. The remnants of this mining history can still be seen with up to 20 or more open and unsigned mine shafts scattered through the park, as well as an adit (which itself contains an open mine shaft), a boiler, timber gantry, crucibles, metal ware, and the ruins of the former mining township. None of the sites associated with mining history within Ediacara Conservation Park are listed on the South Australian Heritage Register.

While a detailed assessment of the vegetation and fauna of the park has not been undertaken, there may be species and communities of conservation significance and habitat for threatened species present. Stock from neighbouring properties currently graze through the park and access a watering point on the western boundary due to the lack of boundary fencing. There is potential for grazing to impede the recruitment and growth of native vegetation. Grazing and vegetation trampling can remove habitat for native fauna, facilitate the spread of weeds and encourage erosion. The resulting altered soil structure has potential to disturb important fossil beds and other areas of significance. Grazing by rabbits and goats also presents a threat to the values of the park.

Further investigations are required to determine what native plants and other smaller scale vegetation communities exist in the park. The long-term aim of native vegetation management is to restore and maintain the integrity of the native vegetation communities in the park, primarily through fencing of sensitive areas to prevent access from stock.

Fencing of priority areas will be carried out as required to address the risks associated with the remnants of mining history and the potential for damage and erosion associated with grazing. These priority areas for conservation and risk management may include, but are not limited to: threatened plant species or ecological communities, habitat for threatened fauna, important fossil locations, areas sensitive to disturbance and erosion, and heritage sites. DEWNR will liaise with neighbouring landowners regarding strategies to resolve stock grazing issues and the erection and maintenance of fencing around these priority areas whilst taking stock access to watering points into consideration.

Objectives and Strategies

Conserve and protect the natural and cultural values of the park

- Conserve values and places of significance in consultation with Adnyamathanha traditional owners
- Initiate efforts to remove and exclude domestic stock from priority areas of the park, including the erection and/or repair of appropriate fencing in cooperation with park neighbours
- Continue to liaise with the South Australian Museum and others regarding best practice protection of fossils
- Initiate efforts to improve knowledge about the native flora, fauna and vegetation communities that exist within the park to ensure their adequate conservation
- Facilitate research into the significance of historic sites and structures within the park



Theme 3: Managing risk associated with past mining activities and providing for responsible exploration and mining in the future

The open and unsigned adit, mine shafts and other remnants of mining history may pose a safety risk. Park managers have begun installing covers on mine shafts and will liaise with the Department of Manufacturing, Innovation, Trade, Resources and Energy (DMITRE) to undertake and implement a risk audit to identify locations within the park that will require further safety measures to minimise risks associated with the old mine workings.

The proclamation of Ediacara Conservation Park in 2007 allows for the continuation of existing and future rights of entry, prospecting, exploration and mining under the *Mining Act 1971* and *Petroleum and Geothermal Energy Act 2000*. Approval is required from the Minister for Sustainability, Environment and Conservation to undertake exploration and mining activities within Ediacara Conservation Park and specific licence conditions may be imposed.

Prior to commencement of any licensed mineral exploration or mining activities, a Program for Environment Protection and Rehabilitation (PEPR) must be prepared by the proponent and approved by the Minister for Mineral Resources and Energy. Depending on the nature and location of activities, the Minister for Sustainability, Environment and Conservation will also have a role in relation to the approval of the PEPR and the grant of any licence. The development of a PEPR, in consultation with traditional owners and government, ensures that the licensed mineral exploration activities are consistent with the objectives of this plan. Through this process, practices are established to avoid or restrict the environmental impact of exploration activities, and ensure the rehabilitation of disturbed sites. This collaborative process also ensures that proponents address any risks to Aboriginal cultural values and comply with their responsibilities under the *Aboriginal Heritage Act 1988*.

Exploration techniques must be utilised in a manner that minimises impacts on the natural and cultural values of the park. Specifically, licensees are to avoid any exploratory activity that could be detrimental to and/or compromise the value of sensitive areas within the park, in particular those areas that contain fossilised remains or are likely to contain fossilised remains. These details should be determined in consultation with the South Australian Museum.

Progressive rehabilitation of any disturbance associated with works will be required, with rehabilitation activities to be completed within 6 months of the cessation of activities. This work will need to be planned in consultation with the South Australian Museum so as to minimise the impacts on the natural and cultural values of the park.



Objectives and Strategies

Ensure protection of the park's mining history and ensure future exploration and mining activities are undertaken in a way that minimises impacts on the park values while minimising risks to public safety

- Liaise with DMITRE to undertake and implement a safety and risk assessment of the old mine workings in the park to minimise the danger to park users
- Minimise public risk by continuing to erect structures such as covers on mine shafts and/or fencing around key areas as required and ensure adequate signs are erected within the park outlining the dangers posed by old mine workings and shafts. Signs should be limited to the areas around mine shafts and workings, and any other areas deemed necessary
- Ensure exploration and mining activity conditions seek to prevent natural, palaeontological and cultural impacts, particularly for those areas containing or having a high likelihood of containing fossilised remains

Scientific research permits

The conditions applied to Scientific Research Permits for palaeontological research in the park may include but are not restricted to the following:

- Researchers are to avoid activities that will be detrimental to populations of native flora and fauna, particularly those of conservation significance.
- If fossil excavation is to occur, researchers are to conduct such activities in a manner that minimises or inhibits further soil and sediment erosion.
- Rehabilitation may be required of any disturbance associated with fossil research.
- Approval to access the park must be sought from the park manager at least 10 working days prior to entry.
- All researchers visiting fossil sites must be accompanied by an appropriately experienced guide/observer as determined by the park manager. This is required irrespective of whether the research requires collection of material, observations, and destructive or non-destructive *in situ* research methods. Accompanied visits will assist in monitoring the status of the park during each visit, will help narrow down times when any damage might have occurred, and demonstrate that visits to fossil sites are a privilege and not a right.
- An assessment of the potential for Aboriginal cultural and Native Title impacts needs to be included in application appraisals involving disturbance of soil or rocks.
- If Aboriginal sites, objects or remains are uncovered during fossil research and/or excavation, activities must cease and the Minister for Aboriginal Affairs and Reconciliation must be advised.
- Researchers must comply with additional recommendations made by the park manager in relation to carrying out their activities.



Ediacaria flindersi

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Nic Klaassen, Eden Hills, South Australia.

For further information please contact:

Department of Environment, Water and Natural Resources Phone Information Line (08) 8204 1910, or see SA White Pages for your local Department of Environment, Water and Natural Resources office. Online information available at: www.environment.sa.gov.au

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GPO Box 1047 Adelaide SA 5001

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