IUCN Conservation Outlook Assessment 2014 **(archived)**
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Please note: this is an archived Conservation Outlook Assessment for Australian Fossil Mammal Sites (Riversleigh / Naracoorte). To access the most up-to-date Conservation Outlook Assessment for this site, please visit https://www.worldheritageoutlook.iucn.org.

Australian Fossil Mammal Sites (Riversleigh / Naracoorte)

SITE INFORMATION

Country:
Australia
Inscribed in: 1994
Criteria:
(viii) (ix)

Site description:
Riversleigh and Naracoorte, situated in the north and south respectively of eastern Australia, are among the world's 10 greatest fossil sites. They are a superb illustration of the key stages of evolution of Australia's unique fauna. © UNESCO

SUMMARY

2014 Conservation Outlook

Good

While a number of threats and other issues affecting the site exist they are all minor and do not impact upon the Outstanding Universal Value of the Property. The current state of the AFMS World Heritage values is good and stable. Ongoing research should be encouraged and secured. There are however certain concerns about funding security and consequent effects on attaining and managing future research. The unique aspect of the AFMS is that its value lies in knowledge and understanding, a value which should be constantly pursued and enhanced.

Current state and trend of VALUES

Good
Trend: Stable

The current state of the AFMS WH values is good and stable. The extent to which the fossils are affected by excavation in Riversleigh is less than 1%. Excavations in Naracoorte affect a higher proportion but most of the valuable deposits have not been disturbed. Both sections of the Property have implemented strict procedures to ensure that disturbance is minimal and that the specimens retrieved are not widely dispersed.

Overall THREATS

Very Low Threat

All in all the threats to the site’s values are very low. The impact from illegal removal of material from the Riversleigh area is minor and does not detract from WH values. Concerns about compliance with research practices should be addressed by rigorous monitoring by the management authorities. At Naracoorte, access to the site is by permit and/or supervision. Illegal access is a low threat - Naracoorte’s fossil sites are underground and in the main are secure from impact from natural events. Overall, the threat to the World heritage values of the

property is very low.

Overall PROTECTION and MANAGEMENT

Mostly Effective

The protection and management of the property is mostly effective although there is some concern about the security of funding. There is no single management plan for the entire World Heritage property which consists of two component sites – Riversleigh and Naracoorte; however, there have been discussions about development of a management framework for the entire site.

FULL ASSESSMENT

Description of values

Values

World Heritage values

► **Extensive deposits of vertebrate fossils**
Criterion:(viii)

The Property contains and protects extensive vertebrate fossil deposits which provide a significant insight to the understanding of the record of life in Australia during some major stages of Earth's history.

Riversleigh provides exceptional, and in many cases unique, mammal assemblages spanning the period from 10-30 million years ago. From studying these assemblages it is possible to document changes in habitat from humid, lowland rainforest to dry eucalypt forests and woodlands. These assemblages also provide the first fossil record for many distinctive groups of living mammals such as the marsupial moles and feather-tailed possums. The Naracoorte assemblages open a window into a significant period of Earth’s history from the mid-Pleistocene to present (530,000 years ago to today), a period characterised by great climatic changes. (SoOUV, 2012)

► **Evidence of evolutionary change**
Criterion:(ix)

The two component sites provide complementary evidence of key stages in the evolution of the fauna of one of the world's most isolated continents. The history of mammal lineages in modern Australia can be traced through these fossil deposits and, as a consequence, there is a better understanding of the conservation status of living mammals and their communities. Both

component sites are rich in a diverse range of vertebrates including mammals and at Riversleigh also plants and invertebrates.

The Naracoorte assemblages span the time of arrival of humans to Australia and thus are of additional value in helping unravel the complex relationships between humans and their environment. They highlight the impacts of both climatic change and humans on Australia's mammals, including its now vanished megafauna. (SoOUV, 2012)

Other important biodiversity values

- **Breeding habitat for the critically endangered Southern Bentwinged Bat**

The major extant faunal feature of the Naracoorte section of the Property is its population of 'Critically Endangered' Southern Bentwinged Bats (Miniopterus schreibersii bassanii).

Each population of Bent-winged Bats in Australia occupies a relatively discrete geographical range. Within this range, one cave will be chosen as the maternity site and used for the birth and rearing of each generation of young. In the case of the Naracoorte population its range consists of south-eastern South Australia and south-western Victoria and the maternity site for the population is a cave within the Property boundary. Here the bats gather in September and give birth during November/ December. By mid to late April the pups are capable of independent flight and hunting. Most of the population leave the maternity cave at this time and disperse to other caves, many of which are within the Property, and enter a state of torpor during winter.
Although currently numerous, this bat is an extremely vulnerable species. Disturbance at the maternity site can lead to massive death among juveniles. Similarly, disturbance during winter torpor leads to depletion of fat reserves and subsequent death from starvation.

The population is entirely dependent on night flying insects for food which in turn provide the environment for a wide range of invertebrate species including parasites and organisms that live in bat guano. Over 30 species of

arthropods have been collected from the guano deposits of the maternity cave, some of which appear to be endemic to the cave.(TNMP), (Periodic Report).

Assessment information

Threats

Current Threats

Very Low Threat

All in all the threats to the site's values are very low. The impact from illegal removal of material from the Riversleigh area is minor and does not detract from WH values. Concerns about compliance with research practices should be addressed by rigorous monitoring by the management authorities. At Naracoorte, access to the site is by permit and/or supervision. Illegal access is a low threat - Naracoorte's fossil sites are underground and in the main are secure from impact from natural events. Overall, the threat to the World heritage values of the property is very low.

► Agricultural/ Forestry Effluents

Very Low Threat
Inside site
Outside site

There is some evidence that the population of 'Critically Endangered' Southern Bentwinged Bats (Miniopterus bassanii) that breed in the park each year has declined significantly over the past 30 years. Preliminary studies indicated that agricultural and viticultural practices may be contributing to this decline with the use of pesticides. (Periodic Report, 2003)

Recent population monitoring indicates early population estimate methodology was flawed and that population variance has most likely been the result of normal fluctuations in climate. Viral infection impacted in the previous decade. Population monitoring is continuing to better understand

the population dynamics of this species. The species status under the Federal EPBS Act is Critically Endangered though expected to be downgraded to Endangered; in South Australia it is listed as Endangered and in Victoria the status is Threatened. (Draft National Bat Recovery Plan, L.M. Lumsden and M.L. Jemison, 2012)

► Fire/ Fire Suppression

Very Low Threat
Inside site

Wildfires occur at Boodjamulla and have an impact on extant biota but this isn't a significant issue in World Heritage site. QPWS is working with neighbours to develop a system of fire control on a broad scale to minimise risk of large scale conflagrations. (Periodic Report, 2003)
Dept of Environment, Water and Natural Resources (DEWNR), South Australia has a Fire Management Plan (2010-2020) that facilitates practical reduction of fire impact.

► Tourism/ visitors/ recreation

Very Low Threat
Inside site

While evidence of small-scale disturbance was found it was determined to be of low level. The responsible management authority subsequently developed a public education campaign to ensure visitors were well informed that removal of material is not permitted. (Periodic Report, 2003)

► Other

High Threat
Inside site

Both the Naracoorte Management Plan and the Riversleigh Management Strategy acknowledge the significance of ongoing research to fully realize the World Heritage values of the Property. Both acknowledge the need to ensure that research is sustainable and detail appropriate controls and permitting procedures.

Both acknowledge the need for some degree of structure in the research. The Naracoorte plan includes a requirement to 'establish a research program

coordinating committee’ and the Riversleigh strategy includes the requirement to ‘develop and implement a five-year Research Plan’. (TNMP), (TRMS)

A grant application (July 2013) to establish the informal community advisory committee into a formal AFMS Naracoorte advisory committee was successful but as at November 2013 awaits sign-off by the Minister for the Environment. (Accompanying document - AMFS Naracoorte Monitoring Evaluation Reporting and Improvement Strategy 2013-16)

Potential Threats

Protection and management

Assessing Protection and Management

► Sustainable use

Highly Effective

Use of the site is limited mainly to research, education and tourism which pose little to no threat to the site’s values.

Research proposals are examined by the Park Manager to determine the impact on the area of cave to be accessed. The manager and researcher determine methods to minimise these impacts both from a conservation and aesthetic viewpoint if the area is in the public view.
A `Researchers Protocol' covers all aspects of fossil extraction including minimum information that is to be recorded and procedures that are to be followed.
The potential threat of tourism is addressed by implementing rigid policies which prohibit access to all fossil producing caves within the park except where visitors are under the direct supervision of a park employee. (Periodic Report), (TRMS)

► Sustainable finance

Some Concern

In Australia it is a general principle for the state governments to fund day-to-day management activities in World Heritage properties while the national government funds those additional activities necessary to meet World Heritage obligations. (TRMS)

The AFMS remains dependent upon regional funding to undertake any programs which are specifically targeted on the World Heritage values.

Faced with growing competition for finite resources this funding is naturally, and even correctly, more focused on protecting Australia's existing biota than understanding its extinct biota so the AFMS is unlikely to be a priority for funding regardless of its WH importance.

► Relationships with local people

Highly Effective

A Riversleigh Community and Scientific Advisory Committee have been established, with representation from the scientific community, Queensland Museum, tourism, Waanyi traditional owners, and local, Queensland and Australian governments.
The Riversleigh Management Strategy gives priority to involving the community in management and planning of the Property. (TRMS)

Naracoorte has been able to gain the support of the local community. A strong 'Friends of Naracoorte Caves' group, an active consultative committee and supportive local businesses along with an understanding of the role the community has had in the development of Naracoorte Caves NP over 160 years contributes to a positive partnership between the park and community. (Accompanying document - Final Draft AMFS Naracoorte Master Plan – Nov'13)

Continued Indigenous stakeholder involvement in consultative arrangements needs to be maintained to ensure that consensus and understanding underpin the future management of the site.

► Legal framework and enforcement

Highly Effective

The Riversleigh fossil deposits are situated within the boundary of the Boodjamulla (Lawn Hill) National Park, but also extend outside the World Heritage area on both the NP and also on Riversleigh Station. Naracoorte fossil deposits are situated within the Naracoorte Caves National Park. Both sections of the Property are protected under the relevant parks legislation of the States in which they are situated. (TRMS)

They are also subject to the national Environment Protection and Biodiversity Conservation Act 1999 under which any action that has, will or might have a significant impact on the World Heritage values of a World Heritage property must be referred to the responsible Minister for consideration. Importantly, this Act also aims to protect World Heritage properties from impacts that originate outside the property. It thus forms an additional layer of protection designed to protect values of World Heritage properties from external impacts. (Periodic Report)

► Integration into regional and national planning systems

Highly Effective

The Australian and South Australian governments endorsed The Naracoorte Caves National Park Management Plan in February 2001 following a lengthy period of community consultation.

The South Australia Heritage Act, 1993 provides for the conservation of places of heritage value and the Development Act 1993 provides for planning and regulating development, the management of land, and the design and construction of buildings.

The Boodjamulla NP, which Riversleigh component is part of, has a Management Strategy in place. The Riversleigh Management Strategy is currently under review.
The Queensland and South Australian governments are currently in discussions about the development of an AFMS Management Framework.

► Management system

Mostly Effective

Management of both components of this serial site appears effective.

However, development of a management framework for the entire site would further strengthen its management.

► Management effectiveness

Mostly Effective

Management of both components of this serial site appears effective. However, development of a management framework for the entire site would further strengthen its management.

► Implementation of Committee decisions and recommendations

Data Deficient

None applicable

► Boundaries

Mostly Effective

The boundaries of the Naracoorte Caves National Park do not match those of the caves in which the fossil deposits occur, although the entrances to the caves are protected. Since the World Heritage inscription, the boundaries of the National Park have been expanded and cover most known caves within the park. Additional land has been purchased and added to the park providing greater security. The fossil deposits in these areas may need to be assessed for World Heritage significance, leading to the possible extension of the World Heritage boundary.

The Riversleigh section of the Property is contained within the boundaries of the Boodjamulla (Lawn Hill) National Park and the boundary is deemed to be adequate. (Periodic Report)

► Staff training and development

Data Deficient

The need for staff training and development in regard to World Heritage values and management is addressed in both the Riversleigh strategy and the Naracoorte plan, (Periodic Report) but no assessment of the delivery and effect of such training has been sighted.

► Education and interpretation programs

Mostly Effective

Education is a small but significant use of the Riversleigh section of the property where the UNSW research team has developed large amounts of educational and interpretation material over the years.

Education has long been an integral part of the Naracoorte experience; special exhibitions and displays are an ongoing part of site presentation. While some of these take place external to the park, they mainly occur in the park's visitor interpretive centre which includes a sophisticated series of animatronic displays set within recreated habitats. An extensive educational program has been developed and is still expanding. A building was specially modified to support the delivery of education programs. Literature on World Heritage is distributed to school groups that visit and the World Heritage video is also shown. (Periodic Report)

► Tourism and interpretation

Mostly Effective

The Riversleigh Strategy recognizes that visitors play a significant part in ensuring that the World Heritage area has a continuing function in the life of the community and that tourism provides important social and economic benefits to the region. An Interpretation Strategy was developed in 2012.

The Naracoorte Caves National Park is promoted as a prime visitor attraction and plays a substantial role in regional tourism. Modification of the caves to facilitate the interpretation of fossil deposits revolutionised the visitor experience as has the site's interpretative centre which is focused specifically on the WH values. Cave tours give visitors an appreciation of the processes which formed the caves and their contents, with particular focus on the fossil deposits, the aesthetics of caves and the biology and cultural history of the caves and the region in which they occur.

► Monitoring

Data Deficient

Both sections of the Property have management documents which

acknowledge the need to establish and maintain monitoring programs, however there is insufficient published data/ information to assess the effectiveness of monitoring of the AFMS. Monitoring of research is done through DEH and EPBC permitting and reporting.

► Research

Mostly Effective

There has been an enormous amount of literature published in regard to research in the AFMS which is not surprising as research is the cornerstone of the Property's WH value.

Overall assessment of protection and management

Mostly Effective

The protection and management of the property is mostly effective although there is some concern about the security of funding. There is no single management plan for the entire World Heritage property which consists of two component sites – Riversleigh and Naracoorte; however, there have been discussions about development of a management framework for the entire site.

► Assessment of the effectiveness of protection and management in addressing threats outside the site

Highly Effective

External threats are minimal and adequately addressed by the Environment Protection and Biodiversity Conservation Act 1999. This Act is the statutory instrument for implementing Australia's obligations under the World Heritage Convention.
Importantly, the Act also protects Properties from impacts even if they originate outside the property. (SoOUV, 2012)

► Best practice examples

Both sections of the Property have successfully developed an integrated approach to education, site interpretation and tourism. For Naracoorte this is primarily achieved as a function internal to the Property with some community outreach activity while for Riversleigh it is primarily achieved as

an external function with some internal activities. The Riversleigh Society supports research and public promotion of paleontological science.

Both sections of the Property acknowledge that research is a critical function and that the function is also a potential significant threat. An appropriate philosophical position has been taken and strategies developed to accommodate destructive research within a conservation framework.

State and trend of values

Assessing the current state and trend of values

World Heritage values

▶ **Extensive deposits of vertebrate fossils**

Good
Trend:Data Deficient

The extent to which the resource is affected by excavation in Riversleigh is less than 1% and all specimens remain the property of the Queensland museum. Excavations in Naracoorte affect a higher proportion but most of the valuable deposits have not been disturbed.
Both sections of the Property have implemented strict procedures to ensure that disturbance is minimal and that the specimens retrieved are not widely dispersed.(Periodic report), (TRMS), (TNMP),

▶ **Evidence of evolutionary change**

Low Concern
Trend:Data Deficient

This value is derived from comprehensive interpretation of the fossil fauna assemblages and what has been learned cannot be unlearned.
However, there is always more that can be learned and ongoing research must be encouraged. The absence of an overall and up to date management plan which includes a proactive management approach to planning, directing and funding gives rise to some concern.

Other important biodiversity values

▶ Breeding habitat for the critically endangered Southern Bentwinged Bat

The major extant faunal feature of the Naracoorte section of the Property is its population of ‘Critically Endangered’ Southern Bentwinged Bats (Miniopterus schreibersii bassanii).

Each population of Bent-winged Bats in Australia occupies a relatively discrete geographical range. Within this range, one cave will be chosen as the maternity site and used for the birth and rearing of each generation of young. In the case of the Naracoorte population its range consists of south-eastern South Australia and south-western Victoria and the maternity site for the population is a cave within the Property boundary. Here the bats gather in September and give birth during November/ December. By mid to late April the pups are capable of independent flight and hunting. Most of the population leave the maternity cave at this time and disperse to other caves, many of which are within the Property, and enter a state of torpor during winter.
Although currently numerous, this bat is an extremely vulnerable species. Disturbance at the maternity site can lead to massive death among juveniles. Similarly, disturbance during winter torpor leads to depletion of fat reserves and subsequent death from starvation.

The population is entirely dependent on night flying insects for food which in turn provide the environment for a wide range of invertebrate species including parasites and organisms that live in bat guano. Over 30 species of arthropods have been collected from the guano deposits of the maternity cave, some of which appear to be endemic to the cave.(TNMP), (Periodic Report).

Summary of the Values

▶ Assessment of the current state and trend of World Heritage values

Good

Trend: Stable

The current state of the AFMS WH values is good and stable. The extent to which the fossils are affected by excavation in Riversleigh is less than 1%. Excavations in Naracoorte affect a higher proportion but most of the valuable deposits have not been disturbed. Both sections of the Property have implemented strict procedures to ensure that disturbance is minimal and that the specimens retrieved are not widely dispersed.

▶ **Assessment of the current state and trend of other important biodiversity values**

Good

Trend: Data Deficient

Despite some early concerns for the stability of the critically endangered population of southern bentwinged bats which breed within the Property (Periodic Report) more recent research has revealed that the earlier concerns were unfounded. The species status under the Federal EPBS Act is Critically Endangered though expected to be downgraded to Endangered; in South Australia it is listed as Endangered and in Victoria the status is Threatened. (Draft National Bat Recovery Plan, L.M. Lumsden and M.L. Jemison, 2012)

Additional information

Key conservation issues

▶ **The need for funding for research pertaining to the AFMS's WH values understood to be a core operational requirement**

National

Without secure funding forward planning for research becomes impossible.

Benefits

Understanding Benefits

► Carbon sequestration

The property facilitates research leading to an understanding of paleaoclimates and the possible implications for climate change.

► History and tradition

The Property is of cultural significance to the traditional owners (Riversleigh) and has long held an importance in the early development of the Naracoorte community.

► Importance for research

The Property’s core value lies in the knowledge derived from ongoing study of the fossil deposits providing insights to evolutionary trends in response to climate change.

► Outdoor recreation and tourism

The Property provides significant opportunities for recreation and educational tourism which in turn stimulates local economic activity.

Summary of benefits

The essential benefits derived from the Property are:
A) the knowledge gained from research contributes to the global community’s understanding of climate change and species evolution and
B) the conversion of such knowledge to an education focused tourism product for the economic benefit of regional and isolated communities.

Projects

Compilation of active conservation projects

№	Organization/ individuals	Project duration	Brief description of Active Projects
1	UNSW		Various projects

№	Organization/ individuals	Project duration	Brief description of Active Projects
2	Friends of Naracoorte Caves (FONC)		Population monitoring of Southern Bentwinged Bats (Miniopterus schreibersii bassanii), AFMS Naracoorte

Compilation of potential site needs

№	Site need title	Brief description of potential site needs	Support needed for following years
1	NA	Develop interpretive display in the fossil laboratory, AFMS Naracoorte	

REFERENCES

№	References
1	AMFS Naracoorte Monitoring Evaluation Reporting and Improvement Strategy 2013-16
2	Australian World Heritage Advisory Committee -Discussion Paper – August 2009(AWHAC, 2009)
3	Australian World Heritage Advisory Committee, August 2010 (AWHAC, 2010)
4	DEWNR Fire Management Plan
5	Draft National Bat Recovery Plan, L.M. Lumsden and M.L. Jemison, 2012
6	IUCN Technical Evaluation, Australian Fossil sites. (IUCN-ED)
7	Management of Underground Protected Areas, Steven Bourne, Manager, Naracoorte Caves National Park (Mang’t of U’ground PA’s, Bourne)
8	Periodic Report 2002 - Section II Australian Fossil Mammal Sites (Periodic Report)
9	Powerful Partnerships: Involving Community in Managing Natural Resources, S. Manager, Naracoorte Caves National Park,(unpub.) (Powerful P’ships)
10	Statement of Outstanding Universal Value (2012) (SoOUV)
11	The Naracoorte Caves National Park Management Plan, 2001. (TNMP),
12	The Riversleigh Management Strategy (TRMS)
13	World Heritage Nomination - IUCN Summary (WHNom)