

The Australian Fossil Mammal Sites: Riversleigh/Naracoote

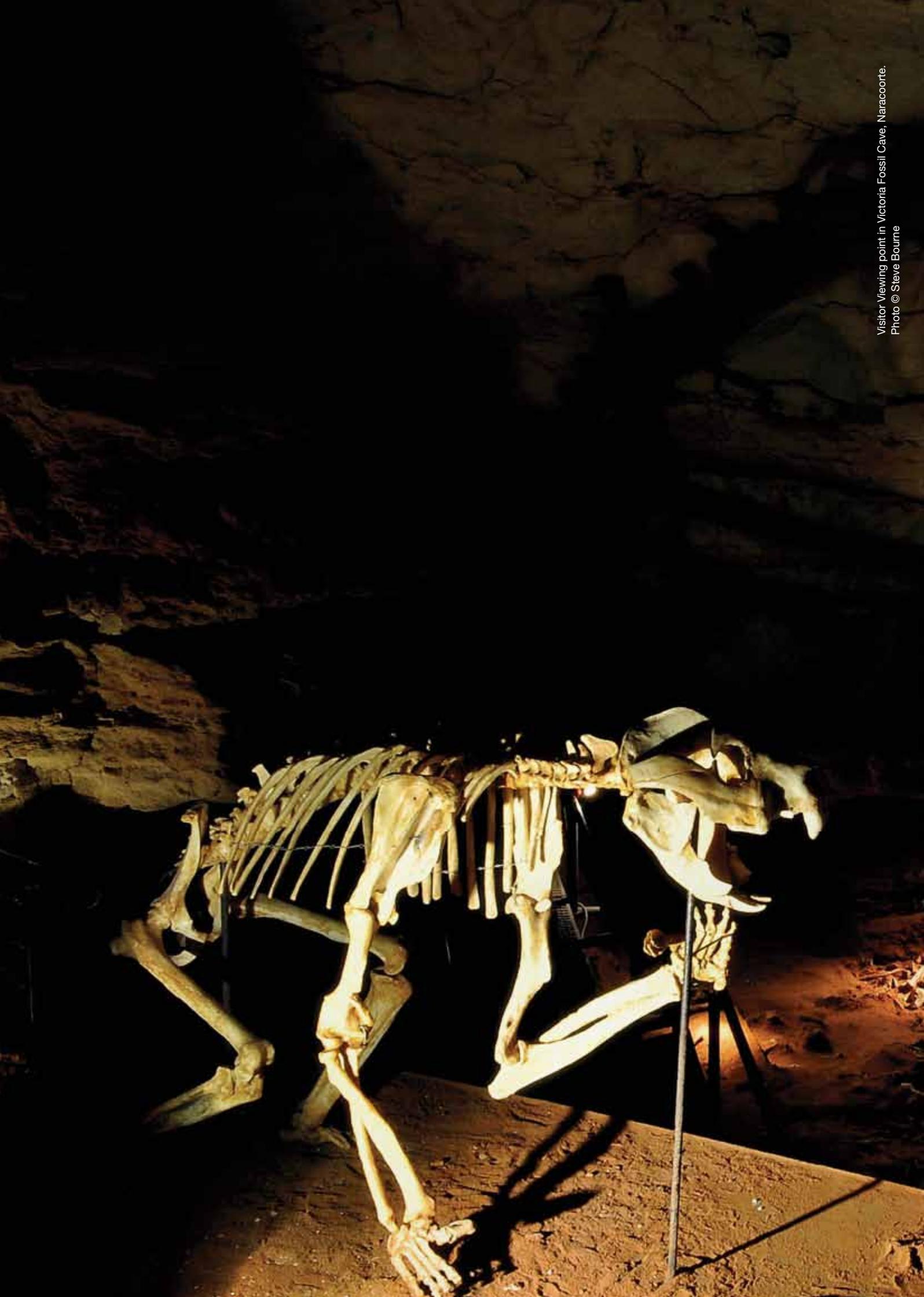
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The Australian Fossil Mammal Sites (AFMS) World Heritage Area consisting of South Australia's 'Naracoote caves' and Queensland's 'Riversleigh Fossil Fields,' was the first property to be inscribed on the World Heritage List in 1994 as a serial property with two distinct geographical areas that are thematically linked (Luly and Valentine, 1998). The two sites, over 2000 kilometres apart, are outstanding illustrations of the key stages of the evolution of unique wildlife of Australia over the last 30 million years, a continent where the evolution of mammals has been the most isolated and distinctive in the world (DSEWPaC, 2013a).

Riversleigh is 100 km² in size and located in rugged limestone country in north west Queensland within Boodjamulla (Lawn Hill) National Park approximately 200 km north of Mt Isa. Riversleigh boasts an outstanding array of fossils from the Oligocene to Miocene (10-30 million years ago) periods and showcases Australia's mammals evolving during the period of Earth's greatest diversity of plants and animals. In terms of the extent to which fossil mammal assemblages have increased knowledge about the biodiversity of a continent, few, if any, have been as illuminating as Riversleigh (EPA, 2002). Here the remains of unique Australian prehistoric plants and animals from the last 25 or so million years have been superbly preserved in the limestone outcrops. Among these are marsupial lions, carnivorous kangaroos, diprotodontids, huge pythons, and early ancestors of the Tasmanian tiger, platypuses, crocodiles and bats (EPA, 2002).

Naracoote is a much smaller site at 3 km², and is located in the Naracoote Caves National Park (the Park) in the south-east of South Australia, also a rich limestone region. Naracoote's more recent story is found in rich deposits of vertebrate fossils from the glacial periods of the mid-Pleistocene to Holocene (170,000 to 18,000 years ago). Naracoote fossils show Australia's extinct megafauna shrinking and disappearing during later climatic changes and around the appearance of humans in Australia around 50,000 years ago (DSEWPaC, 2013b).

Naracoote was included in the AFMS nomination to cover the Pleistocene period as there was not a good record for this period at Riversleigh at the time of nomination. It was felt that this time frame was important to include as it was when the megafauna were reigning and especially as a counterpoint to the Riversleigh rainforest environments. The Pleistocene



Visitor-Viewing point in Victoria Fossil Cave, Naracoorte.
Photo © Steve Bourne



The dry savannah of north-western Queensland is the unlikely home of one of the world's most important and abundant fossil deposits – Riversleigh.
Photo © Queensland Parks and Wildlife Service

was a period of aridification from which the Australia we see today and all the desert adapted plants and animals evolved (Dr. H. Godthelp, pers.comm., 7 March 2013).

Snapshot of achievement

Prior to World Heritage listing both sites were already afforded protection within their respective national parks. However listing has assisted to ‘boost’ both areas profiles and has been leverage for enhanced community and traditional owner involvement in the management and interpretation of the areas.

The fossils of Riversleigh were first discovered by an American palaeontologist in the 1960s and the known area of fossil bearing limestone was significantly increased in 1983. Ongoing research over the next two decades paved the road towards World Heritage listing. Extraction of the fossil material is imperative to realising the full potential of the site's Outstanding Universal

Value (OUV). Since 1976 around 150 researchers, predominantly from the University of New South Wales have spent several weeks a year during the dry season at Riversleigh. Fossil fauna material has been extracted from over 200 localities at Riversleigh (Archer *et al.*, 2006). The extracted material is then taken back to either a laboratory in Mount Isa or Sydney, where it is placed in an acid solution that dissolves the surrounding hard limestone, yet does not harm the fossils. To date, the UNSW team led by Professor Mike Archer have extracted many tens of thousands individual fossils.

Prior to listing, Riversleigh had no interpretation or infrastructure. However, the dedication of the researchers, national park site managers, local community, local government and advisory committee members has contributed to the enhancement of such facilities and promotion of the property. More work needs to be completed to bring the interpretation and

tourism opportunities up to a good standard and with assistance from State and Federal Governments work has begun to help present, conserve and transmit the OUV of the site.

Riversleigh is also valued for its human history. The Waanyi people are the area's Traditional Owners who have lived, looked after, and were sustained in the area for tens of thousands of years, adapting to considerable climatic change over that period. The Waanyi people have recently had their native title rights formalised, which includes Riversleigh and the wider national park. The managing agencies will continue to work with the Waanyi people to manage the property.

Management frameworks

On ground management of Riversleigh is carried out by the Queensland Parks and Wildlife Service, with strategic and policy directions managed by the Department of Environment and Heritage Protection's World Heritage Unit. The Riversleigh Community and Scientific Advisory Committee (RCSAC) provides advice and assistance to the Queensland and Australian Governments on the development of on-ground projects and to identify management actions to address threats associated with the protection and conservation of the property's OUV. The RCSAC also provides a conduit for community groups, traditional owners, researchers and local government input for management of the World Heritage Area. As with other World Heritage properties in Australia, the Chair of the RCSAC represents Riversleigh at the more strategic level through their membership on the Australian World Heritage Advisory Committee (AWHAC) established by the Australian Government in 2009.

Naracoorte Caves National Park and World Heritage Area (NKNP WHA) is managed by the South Australian Department of Environment, Water and Natural Resources (DEWNR). Naracoorte does not have an advisory committee and the day to day responsibility lies with the Site Manager who reports to the Group Executive Director, Partnerships and Stewardship of the Department, through the Director of Commercial Services. The on ground staff engage with key stakeholders on an 'as-needs' basis.

NKNP WHA has been in strategic planning mode for three years, determining the future direction of the site with input from key stakeholders. Its education program was reviewed, a visitor strategy and branding strategy were approved and an interpretive framework and a master plan will see the current round of strategic planning conclude in 2012/13.

Stakeholders at Naracoorte cross a spectrum of international, national, state, regional and local communities; and the Friends of Caves is an active volunteer group. Other groups engaged with the site include Flinders University, South Australia Museum, South Australian and Victorian caving groups and the South East Aboriginal Focus Group. The site has an active partnership with the Naracoorte Lucindale District Council. Naracoorte's business community supports the NKNP WHA's Advocacy Program promotion – supporting the site in various ways. An example of the town's support is Naracoorte's town entrance sculptures which reflect the sculptures at the Park entrance, linking the town and the site. Initiatives with and by Council will continue to engage community support for the site.

Challenges

Threats to the integrity of fossil sites include natural events such as extreme weather events or fires that are hard or impossible to control. Human actions can generally be managed, but have their challenges with threats such theft and desecration of the fossils remaining an issue for management. Management response to potential impact by people is to control access (by permitting and fencing) and provide interpretation on the site's scientific, conservation and aesthetic values. At an area such as Naracoorte, which is not as remote as Riversleigh and where cave entrances can be locked, it is much easier to control untoward visitors and thieves.

Riversleigh however is large, open and remote, with the hard limestone rock that contains the fossils being their only protective element. Riversleigh is located in an area of active mining exploration and extensive fossil deposits are also found outside of the property. However, it is protected from development and unpermitted fossil removal under both the State *Nature Conservation Act 1992* and the Federal *Environment Protection and Biodiversity Act 1999* (EPBC Act).

The extracted fossil material from Riversleigh resides at the Queensland Museum, the University of NSW and the Riversleigh Fossil Centre in Mount Isa. Research plays an integral role in understanding the property's importance. This includes the use of explosives to aid excavation. Researchers and managers actively manage and plan to ensure there is no significant impact on the area's OUV and to also take into account intergenerational equity issues to enable unexcavated areas to be left for research to occur well into the future.

Naracoorte's fossil deposits are within the property and the most valuable have not been disturbed. While the

surficial boundaries of NCNP WHA do not match those of its subterranean deposits, the entrances to the caves are protected. There is no formal buffer zone around NCNP WHA - adjacent landowners include forestry, farming and vineyards. In 2011 many small reserved areas adjacent to NCNP WHA were incorporated into the Park, adding a further measure of protection.

Flinders University has had a long term research and teaching role at Naracoorte lead by Professor Rod Wells, one of the discoverers of the fossils in Victoria Fossil Cave in 1969. Since his retirement, palaeontologic investigations have continued by Flinders staff, fostered by DEWNR.

Excavation is regulated under State legislation and the EPBC Act and impact is controlled through these

mechanisms. The investigative research provides information and assists presentation and transmission of the World Heritage values to present and future generations. Research results are incorporated into interpretation and education programs.

For both sites, extracted material remains the property of their respective states' museums.

Challenges for the property include:

- adequate funding for research;
- storage of fossils and fossil related material in relation to space and security;
- displaying fossil material;
- ongoing security at the sites as the demand for fossil trade for private collections increases; and
- interpreting and presenting the World Heritage values at extremely remote location such as Riversleigh.

Caring for our Country Research in Blanche Cave, Naracoorte.
Photo © Steve Bourne



Being a serial World Heritage property also presents it challenges in terms of communication and collaboration. As far as World Heritage Committee requirements go the AFMS is considered as one, and the periodic reporting carried out every seven years reflects this. This can prove a challenge as the two sites are vastly different in terms of potential impacts on OUV, remoteness, access and size. The Australian Fossil Mammal Sites does need to work on improving its collaboration between the two areas in order to enhance funding opportunities, help improve management and to assist in the identification of potential extensions to the property.

References

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Links

www.naracoortecaves.sa.gov.au

www.environment.sa.gov.au

www.eoearth.org/article/Australian_Fossil_Mammal_Sites,_Australia#gen11

<http://www.environment.gov.au/heritage/places/world/fossil-mammal-sites/index.html>

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22 years conservation management, New Zealand;
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After graduating in 2005 with a degree in Environmental Science and Management, Angie has worked for a range of environmental organisations in Australia and Europe. Angie's current role involves overseeing seven community, scientific and indigenous World Heritage advisory committees and the strategic planning and policies in relation to establishing, administering and managing three of Queensland's five World Heritage properties, which are all listed for their natural values.