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Geodiversity: the foundation for life

What is geodiversity?

Geodiversity (or geological diversity) is a term which describes the variety of rocks, minerals, soils and landforms, and the processes that have shaped these features over time. Mountains, caves, beaches, rivers, oceans and even the weather are all elements of geodiversity.

Geodiversity is important in understanding the way in which many of the Earth's systems and processes work. It's also important because of its intrinsic value, or more simply, its ability to invoke emotion and provide examples of kind, regardless of any scientific or aesthetic potential.

Geological features provide us with places to live, resources for industry, soils from which we grow food, water for consumption, opportunities for healing, and places for worship, learning and inspiration. Indeed without these features and processes, the world would be a difficult and somewhat uninspiring place to live.

What is geoheritage?

Geoheritage is the term used to describe features of geodiversity which hold special meaning to people, communities or cultural groups. These may include features of cultural and scenic value, such as the giant monolith found in Uluru National Park in the Northern Territory, or places of scientific and recreational value, like the ancient cave system at the Jenolan Karst Conservation Reserve in New South Wales (NSW). Features of geoheritage significance can also include those which yield rare or valuable information on the Earth's natural history, such as fossil deposits and exposed geological bedding.

The action of water, Claustal Canyon.©R.Commins

The foundation for life

Ecosystems, and the life forms within, rely on the bedrock, soils, landforms and related systems and processes for their survival. These features and processes provide the foundation for ecosystem development and are largely responsible for the variety of plants, animals and other organisms that exist today … our biodiversity.

Crowdy Bay N.P. K.Gillett DECC

Many life forms depend on particular geological features and processes for their survival. For example, the Bendethera wattle will only grow on the limestone (or karst) found in three small pockets of the Deua National Park in NSW. Similarly, cave entrances, karst arches and collapsed rock formations provide habitat and protection for a variety of fauna including the endangered brush-tailed rock-wallaby.

The protection and management of geodiversity will help to ensure the local, national and global conservation of biodiversity.

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The Three Sisters, Blue Mountains World Heritage Area. ©T.Garbellini

In fact many sites of geoheritage significance are equally recognised for their biological value, supporting rare or endangered communities, which may not be found elsewhere. This intricate relationship between geology and biology requires on-going protection and is an emerging focus for conservation managers.

Protecting our geodiversity

Geological features (and processes) are formed over millions of years and contain a range of values that require special management. Fine crystal structures, such as those found in limestone caves, may be easily broken by human breath, while fragile calcified plant remains can be crushed by careless walkers. Other features including fossils have been damaged or lost due to souveniring or large scale activities such as mining and construction.

Cave Shawls. ©S.Babka

Human activity can also induce changes to water quality, hydrology, soil forming and development processes and local wind patterns, resulting in the deterioration or loss of geological features that have formed under past climatic or geological conditions. Often described as relicts or fossils, these features provide evidence of past life and atmospheric, hydrological and biological processes and, if disturbed, will never recover.

Mungo N.P. E.Slater DECC

Whilst the need for sustainable management of Australia's geodiversity is widely accepted, past focus has been directed towards biodiversity conservation with minimal recognition of the geological foundation on which this relies. Fortunately, this is changing, with efforts now being directed to better recognise and protect Australia's unique geological heritage.

Published by: Department of Environment and Climate Change NSW
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Department of **Environment & Climate Change** NSW

 ISBN 978 1 74122 775 8 DECC 2008/140 May 2008 Printed on environmentally sustainable paper