



# Karst Research Prospectus



## DECC karst environments

A karst environment, as defined under the *National Parks and Wildlife Act 1974*, is a particular type of environment which has developed in soluble rock through the processes of solution, abrasion or collapse, together with its associated bedrock, soil, water, gases and biodiversity.

NSW has some of the oldest, most complex and most beautiful karst environments in the world. These environments, which are generally less than ten square kilometres in size, have origins dating back 570 million years and are distinguished by limestone caves, arches, sinkholes, underground streams and springs.

The Department of Environment and Climate Change NSW (DECC) is responsible for over 40 karst environments, including four karst conservation reserves and fifteen sites on World Heritage properties. Some, such as those found at the Jenolan Karst Conservation Reserve, have extensive cave systems which are the basis for significant tourism and research activity, while others are lesser known and studied, including Bibby Harbour on the Myall Lakes.

The NSW Government has long been concerned about the preservation of its karst environments. Even before Royal National Park, considered to be Australia's first national park, was declared in 1879, the karst environments at Jenolan and Wombeyan were reserved for recreation and cave protection purposes. In 1989, these reserves and the karst environments at Abercrombie and Borenore were designated as karst conservation reserves, further highlighting their value to the community and to conservation generally.

DECC has a role to protect and conserve these ancient, fragile and often rare environments, and to foster support for conservation initiatives. However, this is often made difficult by inappropriate human activity, floods, drought, and introduced flora and fauna, which may lead to:

- loss of, or reduced, biodiversity and geodiversity
- loss of, or reduced, places or items of cultural heritage significance
- reduced water quality and changes to local hydrology
- damaged rock and mineral formations
- a less satisfying experience for visitors.

Accurate, credible and up-to-date information is needed to enable DECC to make informed decisions about conserving and managing karst environments. Much of this information is likely to come from scientists and researchers, who can help to ensure that karst environments are protected and are able to meet the challenges posed by any future increases in visitation.

This research prospectus explains the types of research DECC is interested in, what to include in a research application, ways in which DECC can assist applicants and who to contact for more information.

## Karst environments and research

NSW karst environments have formed over millions of years and been exposed to a range of climatic conditions and natural events, leading to the formation of caves, and other geological or geomorphological features, which have trapped and preserved evidence of the earth's history.

This living history, and the disparate nature of NSW karst environments, present researchers with a range of study opportunities. Past research, which has benefited karst conservation and management, has included:

- analysing cave formations to discover ways in which they have developed over time – this research could teach us more about the pace and effects of climate change
- dating cave sediments to establish the antiquity of caves and the time, nature and duration of major geological events
- analysing preserved cave contents (e.g. ash, stone and bones) to provide insight into climate variability, species extinction and cultural use
- studying karst ecology to determine lineage and levels of endemism amongst karst invertebrates.

The benefits of research are far reaching. Research can provide baseline data to assist DECC with managing and implementing monitoring and evaluation programs, while science-based public information programs can raise community awareness and understanding of conservation issues. Research findings may also help DECC with policy decisions and in preparing plans and strategies for karst environments.

## DECC needs your expertise

Though the community and DECC have a good understanding of karst systems and processes, knowledge gaps remain. DECC encourages research which has the potential to fill these gaps, and has developed five themes that summarise its requirements (see next page).

DECC also recognises there may be other areas for research that promote understanding of karst environments but do not meet one of the five identified themes. Research applications in this category will be assessed on their merits.

Students and volunteers using their own resources carry out much of the research into karst environments. DECC highly values such research and encourages future applications from similar individuals or groups.





## Research themes

### Theme 1: Identifying karst environments

Research that identifies, collects, collates and records physical or non-physical baseline data on one or a number of karst environments or features.

### Theme 2: Understanding karst environments

Research focusing on the development and formation of karst, and its interactions with the surrounding environment. Activities may include the analysis of soil, water, rocks, sediment, cave formations and other natural features.

### Theme 3: Establishing past, current and future relationships

Research focusing on people's use of karst environments, and the cultural, spiritual, economic and physical significance of karst. The relationship between Aboriginal people and karst is a particular area of interest.

### Theme 4: Determining the impacts of human activities

Research that studies the impacts of human activities on karst environments, features and processes. Research findings may include identifying key negative impacts and ways in which they can be managed or resolved.

### Theme 5: Managing karst environments

Research that will assist DECC in complying with international agreements, conventions and practices, and federal and state legislation and policy.

## What information should research applications include?

DECC is interested in applications which:

- demonstrate excellence in science – demonstrate ways in which your proposed project will meet performance standards and be available for peer review
- demonstrate collaboration between DECC, tertiary and research institutions and community groups
- demonstrate cost effectiveness and timeliness in ensuring a maximum return on any DECC investment
- demonstrate comprehensiveness and accuracy – remember that your application will form the basis for any conditional consent to undertake activities; see 'Obtaining consent' below
- explain, in cases where DECC resources are sought, ways in which the project fits under one or more of the research themes outlined in this prospectus, or alternatively, assists DECC in managing its karst environments; see 'Ways in which DECC can help'
- explain, in cases where DECC resources are sought, the sort of assistance required from DECC; see 'Ways in which DECC can help'.



## Ways in which DECC can help

Subject to the nature and scale of the proposal, DECC may provide assistance through the following:

### Allocated funding

DECC may consider funding research proposals that help to:

- minimise the impacts of climate change through mitigation and adaptation, and sustainable production and consumption
- promote a healthier and cleaner environment, protecting ecological and human health
- conserve and manage natural and cultural features.

These priorities are further categorised in DECC's Science Investment and Management Plan. For more information about this plan, phone Environment Line on 131 555.

### Technical and in-kind support

DECC can support proposals by supplying:

- verbal or written technical advice
- information on proposed study sites and access requirements
- assistance in drafting research proposals and in preparing applications for scientific licences and access permits (see 'Obtaining consent' below)
- assistance in preparing grant applications or collaborative research proposals involving DECC and other agencies
- various in-kind support, such as use of an office, rent free accommodation, allocation of officer time and the loaning of miscellaneous equipment or items.

For more information, contact DECC's Karst and Geodiversity Unit on (02) 6332 7681.

### Collaborative research and partnerships

DECC is interested in establishing strategic research alliances with organisations including universities, cooperative research centres and scientific institutions. Such alliances will enable DECC and its partner organisations to share knowledge, build on existing expertise and information and avoid unnecessary duplication of effort. It will also help DECC to establish a more comprehensive karst network.



# karst



## Obtaining consent

Research in karst environments may involve:

- projects which involve careful or systematic search or enquiry
- the scientific study of a subject
- a course of critical investigation.

In accordance with clause 22 of the National Parks Regulation 2002, research which falls into one or more of the above categories requires the written consent of a delegated officer within DECC.

Alternatively, under s. 132 (C) of the *National Parks and Wildlife Act 1974*, research activities may require a scientific licence. This is particularly the case where damage or harm to protected plants and animals or the habitat of a threatened species is likely.

Scientific licences are issued by DECC's Wildlife Licensing and Management Unit. To obtain a Scientific licence, complete the application form, which is available on [www.environment.nsw.gov.au/wildlifelicences/scientificresearchlicences.htm](http://www.environment.nsw.gov.au/wildlifelicences/scientificresearchlicences.htm). Send the form to:

Wildlife Licensing and Management Unit  
Department of Environment and Climate Change  
PO Box 1967  
Hurstville BC NSW 1481

Following its receipt, the Wildlife Licensing and Management Unit will forward your application to the Karst and Geodiversity Unit for comment and advice. Should your application be accepted, a scientific licence will be sent to you.

Should a scientific licence not be required, the Wildlife Licensing and Management Unit can also issue written consents.

## Need more information?

For help in developing your proposal or for advice regarding scientific licences, cave access or conditions for consent, please contact the Karst and Geodiversity Unit on (02) 6332 7681.

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### Photographs:

Cover: *Large photo: Tourists in Lucas Cave, Jenolan Karst Conservation Reserve – photo J. Lin*

*Top to bottom: The Grand Arch and Blue Lake, Jenolan Karst Conservation Reserve – photo R. Commins; horseshoe bat – photo S. Babka; brush-tailed rock-wallaby – photo S. Babka*

Panel 1: *Caver negotiating a squeeze – photo R. Commins*

Panel 2: *Grose Valley, Blue Mountains National Park – photo R. Commins*

Panel 3: *Top to bottom, left to right: Aquatic cave life (Syncarid) – photo P. Serov; cave bone deposits (owl pellets) – photo DECC; cave formations – photo S. Babka*

Panel 4: *Cave formations – photo R. Commins*

Panel 5: *Left to right: Cave dwelling spider – photo DECC; active straw stalactite and cave crystal – photo T. Matthews.*