

Karst environments: more than caves and pretty rocks

A complex environment

Karst environments are renowned for their diverse array of rare and interesting features, the most notable being caves, which on a global scale attract millions of visitors each year. What is often overlooked or misunderstood however, is the important and often pivotal relationship between karst environments and biological life, including human life.

We depend on karst

The vast majority of the world's population is dependant on food derived from agricultural activities. Karst environments can contain unusual soils that are particularly suited for growing olives and grapes. Caves, in particular, offer excellent conditions for a number of agriculturally-based activities such as aquaculture, mushroom growing and cheese production.

It is estimated that a quarter of the world's population gains its water from karst environments, either from discrete springs or groundwater aquifers. This relationship has influenced the settlement patterns of many cultural groups and led to the habitation of otherwise inhospitable areas. In more recent times, irrigation ventures, hydro-electric schemes and fisheries have relied on water derived from karst environments.



Blue lake, Jenolan. ©R.Commins

In addition to their use in agriculture and as a source of water, karst environments provide places for human recreation and welfare. In certain parts of the world, including Australia, caves are used as places for shelter, refuge and as sanatoria for those with respiratory and other illnesses, particularly where hot springs are present. Karst environments are also used as sources for limestone which is used for agricultural, building and other purposes.



Powerful owl. Karst and Geodiversity Unit. DECC

So do our flora and fauna

Karst environments provide habitat for rare and threatened plant and animal species and communities both on and below the Earth's surface. It is for this reason they are critical to biodiversity conservation. In NSW, karst environments contain soils and bedrock which support a number of flora species including:

- tree species such as *Brachychiton populneus*, *Eucalyptus bicostata* and *Eucalyptus viminalis*
- small tree and shrub species such as *Bursaria spinosa*, *Hymenanthera dentata* and *Notelaea neglecta*
- ground cover species such as *Adiantum aethiopicum*, *Asperula conferta*, *Austrodanthonia racemosa* and *Carex inverse*
- vines and climbers such as *Clematis glycinoides* and *Glycine clandestine*.

Life, including human life, can often depend on the resources provided by karst environments for survival.



Bungonia busland. M-Van Ewijk. DECC

They also support a number of rare or threatened flora species such as the native thistle (*Stemmacantha australis*) and raspwort (*Gonocarpus longifolia*), wee jasper grevillea (*Grevillea iaspicula*) and the small-leaved laurel (*Cryptocarya williwilliana*).

Similarly, a variety of fauna species depend on karst environments for their survival, including:

- bats (which use caves for roosting and maternity purposes)
- gastropods (i.e. snails)
- invertebrates (e.g. amphipods, crickets, spiders, millipedes, beetles and cockroaches)
- vertebrates (e.g. wombats, echidna, possums, wallabies and birds), and
- a variety of bacteria and nanobacteria.

Karst environments can also provide living space for highly evolved cave-dwelling invertebrates (troglodytes), which are unable to survive elsewhere.



Horse shoe bat. ©Gary K.Smith

Species of this type are typically small, lack eyes and pigmentation and have long sensory antennae and limbs enabling them to sense predators and survive on low levels of food.



Twilight habitat, Abercrombie Caves. ©R.Commins

The interdependency between karst environments and life, whether it be human, animal or plant, is an important consideration for today's conservation managers and one which requires further study. It is equally apparent that karst (and its range of environments) comprise more than just caves and pretty rocks, being fundamental and important elements of the natural world.



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