



Cave Ecology

Dwelling in the underground world of caves is an astonishing array of fascinating creatures. Some live in caverns reaching tens of metres in diameter, while others occur in minute pores. Although all live underground, it's vital that we recognise that their ecosystem is linked to the surface above and any changes we make here can affect their subterranean habitat.

Water is vital

Caves can form in many different rock types. In karst areas, carbonate rocks (dolomite or limestone) dissolve in water, creating some of the most extensive cave systems. Water draining underground collects carbon dioxide and becomes acidic. This then dissolves the carbonate rocks, slowly forming a cavern.

Inside the cave, dripping water redeposits minerals from dissolved rocks, creating formations such as the familiar stalagmites and stalactites.

Many cave creatures live in the water and feed on debris washed into the cave. Others feed on creatures that live in the water. For example, the glow-worm builds its silken nest above streams and uses its light to attract caddisflies and other insects (caddisflies have an aquatic larval stage). For all these creatures, maintaining an unpolluted water supply is vital.

A stable environment

Cave environments are strongly buffered against the daily, seasonal and longer term surface climatic changes. They provide stable, sheltered and moist refuges for animals which might otherwise not survive on the surface.

Surface food supply

Green plants cannot grow in the complete darkness of caves, so the food supply for cave creatures must ultimately come from the surface. Plant material falls or is carried in by streams while animals wander, fall or become swept underground.

Cave ecosystems directly depend upon the surrounding surface environment. This means it is essential that we maintain the natural soil, vegetation, and water quality around caves. The special nature of karst makes it particularly vulnerable to degradation and such areas should be treated with special care.

Distinct zones

The cave environment can be divided into four distinct zones:

Entrance zone

Here the surface and underground environments meet.

Twilight zone

Here light progressively diminishes to zero. Plants such as ferns, mosses, liverworts and algae cannot grow beyond the limit of light penetration.

Transition zone

Light is absent here although surface environmental fluctuations such as temperature and moisture are still felt. Cave crickets often congregate here, and on suitable nights venture outside the cave to forage for food.

Deep zone

Remote from entrances, the deep zone is completely dark. Here the relative humidity is high and evaporation rate is low. Temperature is nearly constant all year around.

Creatures living in this zone have become adapted for life in the dark, no longer needing vision. Called troglobites, they may have reduced body pigment and eyes and longer legs and antennae to help them find food in the darkness.

Only small amounts of food ever reach the deep zone so troglobites have to survive long periods without food.

Places to live

Within caves are a number of distinct habitat types. Some animals live in aquatic habitats such as streams and pools. Others live on sediment banks along waterways.

Terrestrial habitats include tree roots, wood, fungi, leaves, animal droppings and carcasses. It is important that cave visitors do not disturb these vital habitats.

Tasmanian cave fauna

Tasmania has one of the richest known cave faunas in temperate Australia. Spiders, crickets, beetles, slaters, snails, harvestmen, millipedes, pseudoscorpions and many other invertebrates live in our caves.

New species are continually being discovered in this largely hidden ecosystem.

Bats rarely live in Tasmanian caves, however some vertebrate animals such as platypus, wombats, devils, possums and rodents may occasionally use caves.

Significance

Cave creatures are an important part of Australia's natural heritage and biodiversity. They play an essential role in underground ecosystems by decomposing organic matter and recycling nutrients through the food web. Many of them are very rare, and include ancient, primitive forms no longer found on the surface. They provide important information for studies of evolution and ecology.

Threats

Maintaining the natural surface vegetation is vital to the survival of cave ecosystems. Loss of vegetation can lead to increased erosion and water runoff. Polluted runoff washes into waterways, which drain underground in karst areas, affecting both the cave environment and the creatures that live within it.

Activities such as limestone quarrying, dam construction, land clearance, forestry and agriculture are potential threats to cave fauna. Changing or polluting the surrounding surface or cave environment can result in loss of habitat as well as underground food sources.

Human visitors to caves may also cause disturbance to, or accidentally trample underfoot, sensitive species and their habitats.

Conservation

To maintain the natural processes in karst areas, it is important to protect the overlying native vegetation—especially around cave entrances and alongside streams which drain into caves.

To protect water quality in karst areas, the entire water catchment must be properly managed.

All fauna occurring in State reserve caves is protected. Species such as glow-worms, crickets, harvestmen, pseudoscorpions and beetles are wholly protected under the *National Parks and Wildlife Act 1970*. It is an offence to take, harm, or kill any of these species without a permit. Twelve cave species are listed under Tasmania's *Threatened Species Protection Act 1995*.

Low Impact Caving

Visitors to caves can minimise their disturbance by adhering to the following code of behaviour:

- Keep to a single path throughout the cave and follow marked routes. Do not wander about the place.
- Avoid making loud noises and shining lights directly on animals.
- Do not leave any foreign material in the cave. If you must eat underground do not leave crumbs.

Remember, Cave S.A.F.E.

S - tread SLOWLY and SOFTLY at all times. Take care where you place your hands and feet.

A - be AWARE of sensitive features, including fauna and their habitats. Walk carefully around waterways, tree roots, sediment banks and organic deposits (leaf litter, wood, dead animals). Look at, but don't disturb, spider webs and glow-worm threads.

F - be FIT. Fitness enables you to move through the cave efficiently, so you can better appreciate the environment and experience. Tiredness and lack of fitness can contribute to cave degradation.

E - EXPERIENCE. Join a caving club - you can learn a lot this way.

Further information

Karst Officer,
Biodiversity Conservation Branch,
DPIPWE, GPO Box 44,
Hobart 7001.
Ph. (03) 6233 6556