

Hastings Cave and Thermal Springs



Teachers Fact Sheet No 7 Threats to Caves

Reserves

Caves are very fragile natural areas. Karst scenery around the world is under threat from quarrying, pollution, deforestation, global warming and vandalism.

In order to protect our Tasmania caves, a number of reserves have been established across the state. Over 95,000ha of karst scenery is now protected in these reserves, which include:

- Mole Creek Karst National Park
- Gunns Plains Cave Reserve
- Junee Cave State Reserve
- Hastings Caves and Thermal Pool Reserve.

Other karst systems are protected in Tasmanian National Parks and World Heritage Areas. For example, Exit Cave, which is the longest in Australia at 23km and noted for its immense chambers, sandy stream-bank deposits and impressive glow-worm displays, is now included within the Southwest National Park. Khazad-Dum, which is 320m deep, making it one of the deepest potholes in Australia, is similarly protected in the Mt Field National Park.

In order to protect them, a permit is required to enter caves in reserve areas in Tasmania.

Threats

Many activities have the potential to affect subterranean caves and their inhabitants.

Quarrying

Quarrying is a constant threat to dolomite and limestone areas. There is an ever-increasing demand for cement and crushed stone, and limestone deposits are destroyed to satisfy this demand. For example, the Exit Cave system was affected by the nearby Bender's Quarry at Lune River, which removed up to 100,000 tonnes of metallurgical-grade limestone per year for 30 years, leaving great scars on the surface, while silt, acid water and sewage in the run-off from the quarry workings caused much damage underground. The quarry was closed by the Commonwealth Government in 1994 to protect the cave.

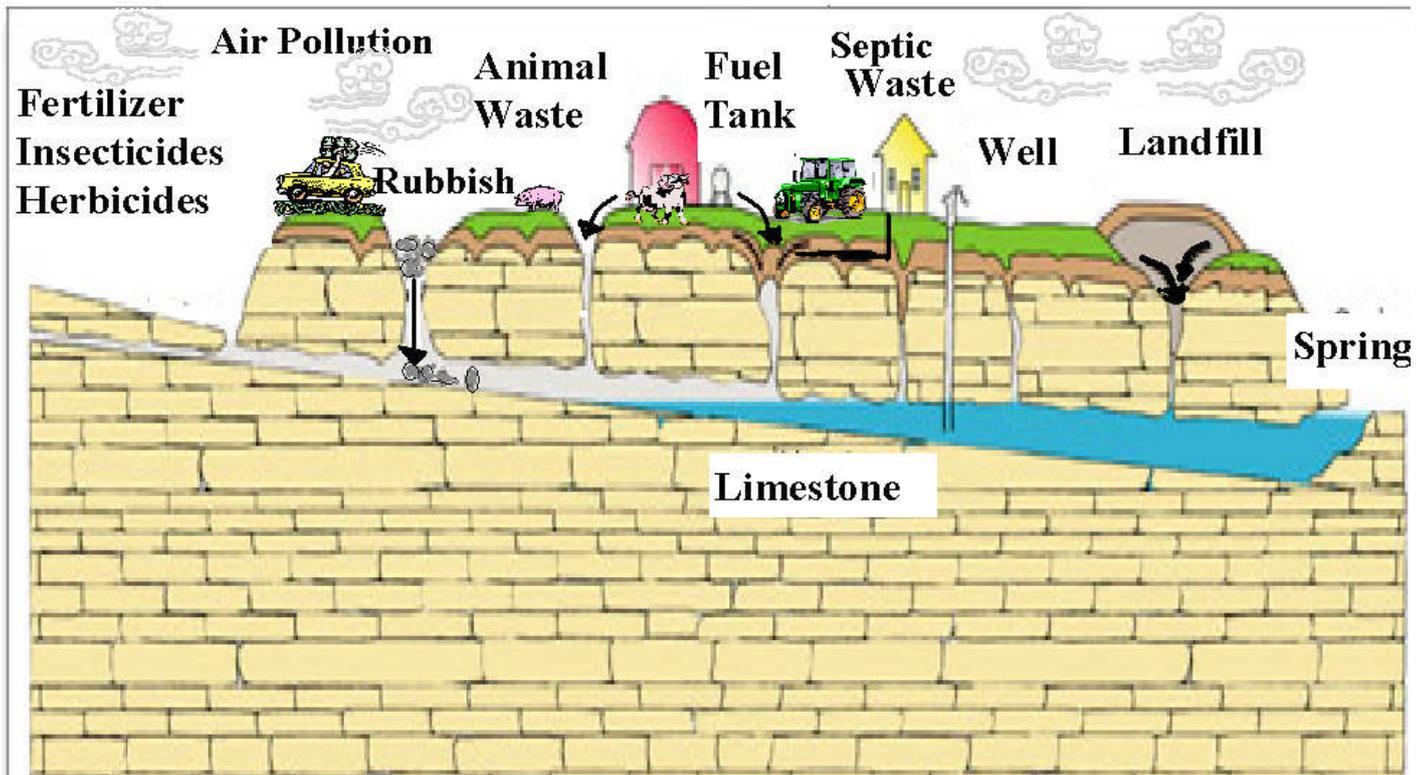
At Railton **in the north-west of the state**, a deposit of Ordovician limestone nearly 900m thick was the major raw material used in the nearby cement works, which produced Portland cement for the Tasmanian market and for export. This was the longest continually working lime works in Australia, operating from 1860 to 1996.

Dolomite is quarried at Smithton and Cressy for use in agriculture, while at Mole Creek agricultural lime and quicklime are produced. Limestone is mined at Flowery Gully for agricultural use and road construction.

Pollution

Inadequate sewage treatment can rapidly lead to pollution of the groundwater, directly threatening aquatic fauna, but ultimately affecting all cave fauna. There are other instances of damage in karst areas where dairy run-off, for example, has polluted waterways underground and sink holes have commonly been used as rubbish dumps. Overuse of fertilizers on pastures above cave systems and flow-off from industrial processes, including contaminants such as PCBs, pesticides, dioxins and gasoline, can also add to the pollution of waterways underground.





Deforestation and removal of surface vegetation

The removal of surface vegetation, whether in forestry operations or by land clearance for farming, can radically affect water-flow patterns so that, in general, flooding will increase in frequency. An increase in silting up by sands and clay can change the microclimate in the cave, and burn-offs after land clearance can add to the pollution of the water entering underground systems.

The alteration of cave structure, such as removal of vegetation, or physical changes in rock structure, such as enlarging the cave entrance, will change airflow patterns, oxygen concentrations, temperature, humidity, and light regimes. Cave species tend to be very sensitive to the smallest micro-environmental changes; if they are unable to adapt to changes they will go extinct or, if possible, abandon the cave. In Flowery Gully Cave in Northern Tasmania the glow-worm population has now disappeared after forestry clearance because the constant level of humidity they require was changed. The cave is now no longer used for tourism.

Tourism

Some cave systems have considerable capacity to sustain visitation, such as those with large rivers passing through underground caverns. Low-energy caves such as Newdegate Cave, however, which naturally has a restricted flow of water and nutrients entering it, are extremely vulnerable.

- Soil-dwelling cave inhabitants may be trampled to extinction, or compaction of soil will reduce aeration and the ability of organisms to penetrate the substrate.
- Compaction of sediments can result in more water being channelled through the cave. Sediment may be eroded, cave pools are filled in, and cave biota may be smothered by poor aeration.
- Disturbance of water pools can increase turbidity and particle suspension.
- Specimen collection can deplete populations—many cave invertebrate species consist of small populations that only exist in a very limited area, so they are vulnerable to extinction.
- Collection of crystals and speleothems can destroy eco systems and wreck the environment for the fauna.
- Introduction of 'foreign' material for the construction of walkways or sound-and-light systems, organic materials carried in on footwear or clothing, and even hair and skin flakes shed by tourists or cave explorers can all disrupt the cave systems.
- Vandalism in the form of graffiti and carvings can damage surfaces.

Lampenflora

When a cave is illuminated for tourism purposes an artificial environment is created, which is capable of supporting primitive plant life. Apart from introducing spores and seeds into the pristine environment of the cave, visitors also alter temperatures and air currents, and introduce foreign materials which may further encourage growth. As these plants rely on the artificial light within the cave, management of the problem is largely a case of installing an appropriate lighting system and minimising the duration for which the lights are on.

Changes to the water table

The Newdegate Cave is drying out as the climate changes. Any decrease in rainfall will affect the cave as the water table lowers and the humidity decreases. Similarly, many caves are under threat where water extraction for human and/or industrial use has lowered the water table so that streams dry up and formations stop growing.