



# CAVES OF THE CAPE



In the Leeuwin-Naturaliste National Park, in the far south-west of Western Australia, one of the youngest rock forms on the planet lies directly on one of the oldest. The young, soft limestone that caps the ridge is honeycombed with beautiful and mysterious caves. The caves are elaborately decorated with stalactites, stalagmites and flowstones and are incredibly fragile. How can we maintain their natural beauty, while catering for the growing number of people who wish to see them?



BY ANNE WOOD

**T**he Leeuwin-Naturaliste National Park extends for 120 kilometres from Cape Naturaliste to Cape Leeuwin, along a unique geological feature, the Leeuwin-Naturaliste Ridge. The Ridge is composed mostly of Precambrian hard crystalline rocks (commonly called granite) capped by limestone and occasional sand dunes.

The ancient Precambrian granulite and granitic gneiss can be seen at many headlands along the coast and has been dated at 2,000 million to 650 million years old. Capping these rocks is an extremely young Tamala Limestone. The limestone was formed during the Pleistocene epoch (over the last two million years) from fragmented shells, calcareous algae and other material, such as silica sand, originally laid down as sand dunes. Water, rich in carbon dioxide, dissolved and redeposited calcium carbonate as it seeped through the dunes, cementing this material together. This type of limestone is much softer than the older, crystalline limestones more commonly encountered through the rest of the world.

### TREASURE TROVES

Caves are formed as water seeps or flows through the limestone. Many caves follow the path of an underground stream, whereas others, formed at the water table, have a more maze-like form. Water dissolves calcium carbonate as it seeps down



through the limestone. This is redeposited to form the vast array of stalactites, shawls, flowstones and other decorations. The young limestone, being particularly soluble, creates exceptionally well-decorated cave chambers.

Apart from their great physical beauty, air of serenity and the adventure they offer to cave visitors, the Leeuwin-Naturaliste caves are important for other reasons. The constant conditions, alkaline environment and protection

from disturbance are ideal for preservation of fossil material. Since the caves have been developed, animals have either fallen into caves accidentally, their bones have been washed into caves, or in some cases an animal may have used a cave as a lair. The history of Aboriginal occupation of the south-west, as well as the extinction of animals at the end of the last Ice Age, has been pieced together through fossil finds in caves of the Leeuwin-Naturaliste Ridge.



#### Previous page

**Main:** The entrance to Giants Cave.  
Photo – Michael James/CALM

#### Insets from top:

**Pendulites:** calcite crystals deposited on the tips of stalactites.

**Helictites,** which grow via a small capillary canal in the centre.

**Subterranean tree roots.**

**Crystals at the end of a straw stalactite.**

**Top left:** A mummified honey possum found in Giants Cave.

**Above left:** The skeletal remains of a bat embedded in flowstone.

**Above:** Cave pearls form in shallow cave pools.

Photos – Norm Poulter

**Left:** Calgardup Cave is easily accessible and can be explored at your own pace.

Photo – Michael James/CALM





Calgardup Cave contains one of four known critically endangered aquatic root mat communities found in the Leeuwin-Naturaliste caves. Permanent water below the surface may support dense root mats. The root mats provide food resources for some of the richest fauna communities known from groundwater in caves. Aquatic species in Calgardup Cave include koonacs (freshwater crayfish), other crustaceans, mites, worms, insects and rotifers (minute aquatic invertebrates). Some of these animals are relicts from when Australia was part of the supercontinent of Gondwana, or even the earlier Pangea period.

## PEOPLE AND CAVES

Achieving a balance between human visitation and conservation of the caves is a challenge. Visitation to the Leeuwin-Naturaliste caves has increased enormously in the past 30 years, and includes commercial operators offering 'adventure' activities, school groups, scouts, members of caving clubs and casual users.

High levels of visitation have caused surface erosion and degradation of vegetation around cave entrances and abseiling sites, and the deliberate or accidental destruction of cave decorations, such as stalactites and flowstones. Less obvious is the disturbance of cave sediments and compaction of the floor.

Tamala Limestone is very soft. In some cave sections, visitor traffic has caused breakdown of rocks and the movement of large amounts of soil, resulting in instability and collapse. An estimated 53 cubic metres of soil and rubble have been removed from the main slope leading to the central rock pile in Giants Cave. This movement of soil and undermining of the rock pile was caused solely by the impact of human feet and occurred between 1977, when



the cave was surveyed, and 1993, when ladders were installed to bypass this area.

People visiting caves may also inadvertently change the microclimate by causing air movements, increasing the temperature, increasing the level of carbon dioxide, encouraging the deposition of dust and changing the level of light. People may also introduce foreign material such as organisms, nutrients or pollutants. These changes can adversely affect cave fauna, which is adapted to survive in an extremely narrow range of conditions. Some changes may also impact on the formation of calcite decorations.

Public safety is another issue. Caves

**Above left:** A column in Giants Cave. Visitors to Giants Cave climb several ladders and scramble over rocks on their way through.

**Above:** A large stalactite in the Arborite Chamber in Giants Cave, a cave of awesome proportion.  
Photos – Michael James/CALM

may have slippery surfaces, loose rubble and unstable areas. Novice cavers can become lost. Ill prepared people may exhaust their light supply. Some caves may contain dangerously high levels of carbon dioxide. Hypothermia is also a possibility in the wetter caves, or if a person is immobile for any length of time.



## THE PAST 10 YEARS

During the past 10 years, the Department of Conservation and Land Management (CALM) has introduced several initiatives to reduce these problems. Following a recommendation in the Leeuwin-Naturaliste Management Plan, a Cave Management Advisory Committee was formed in 1989. This committee included representatives from CALM and caving groups, and was later expanded to include representatives of the main user groups: commercial operators, scouts and schools.

A Cave and Abseil Permit System was established in 1991 to improve both cave and abseiling safety and cave conservation. The permit system restricts the number of participants on each trip, as well as the number of trips into caves. Caves are classified into different categories, with all but two caves, Calgardup and Giants, requiring a permit for entry. Different areas of a cave may have different classifications. Calgardup Cave has sections under all four categories.

Most sites have been classified as 'restricted access' for speleological group and research access only. Groups are limited to between four and six people, with only a few visits permitted each year. Fourteen sites are available for use by groups such as adventure tours and schools. Group sizes vary from six to 20 at these sites and a greater number of trips are available. These sites have been further divided into 'walk-in' horizontal entry caves, and vertical entrance caves and abseiling sites.

Tracks have been marked in many of the caves in the Leeuwin-Naturaliste National Park. This improves cave conservation and public safety, as people are directed away from areas considered delicate or unsafe. Human impact is

**Top left:** The Arborite Chamber in Giants Cave.

**Above left:** A flowstone wall in Calgardup Cave. Flowstone is formed from films of flowing water.

**Left:** A stalagmite in Giants Cave.  
Photos - Michael James/CALM



confined to areas near the track, which in some cases has been 'hardened' by infrastructure such as boardwalks and ladders. Lockable gates have been installed on some of the more popular and well-known caves to prevent unauthorized access, which might damage the cave or put people at risk.

Accreditation requirements for leaders have been progressively increased over the past 10 years. Leaders of groups visiting caves with vertical entrances need to have an Abseil Instructors Certificate. From January 2000, leaders of caving activities must have completed CALM's Cave Leadership Course. This three-day course concentrates on group leadership, group handling skills and cave conservation.

## CALGARDUP AND GIANTS CAVES

Calgardup and Giants Caves were both opened as tourist caves at the beginning of the last century. Stairs and rails were installed and tours were conducted using candles and lamps. The early infrastructure fell into disrepair many years ago. However, the caves were still two of the most visited in the area, and suffered from this uncontrolled access.

Since December 1998, CALM staff have been present at each site. The CALM guide ensures that all visitors are provided with suitable equipment, and briefs them on basic conservation and safety issues before they enter the cave. All revenue collected goes towards cave management. Unlike tourist caves elsewhere in the park, these two caves are not electrically lit and are self-guided, providing a more natural experience of the cave environment. Visitors are equipped with helmets, lamps and information for their very own discovery of these subterranean wonderlands.

Located about 15 kilometres southwest of Margaret River on Caves Road, Calgardup Cave is easily accessible to all ages, having boardwalks throughout. It is relatively shallow, offering magnificent viewing of colourful calcite crystal deposits, including fragile straws, walls of coloured flowstone, stalagmites and stalactites. Calgardup's special features include a subterranean

lake. Live tree roots hang from the roof of the cave, absorbing moisture from the air and lake and, in turn, providing food to the fauna communities, some of which are rare and endangered.

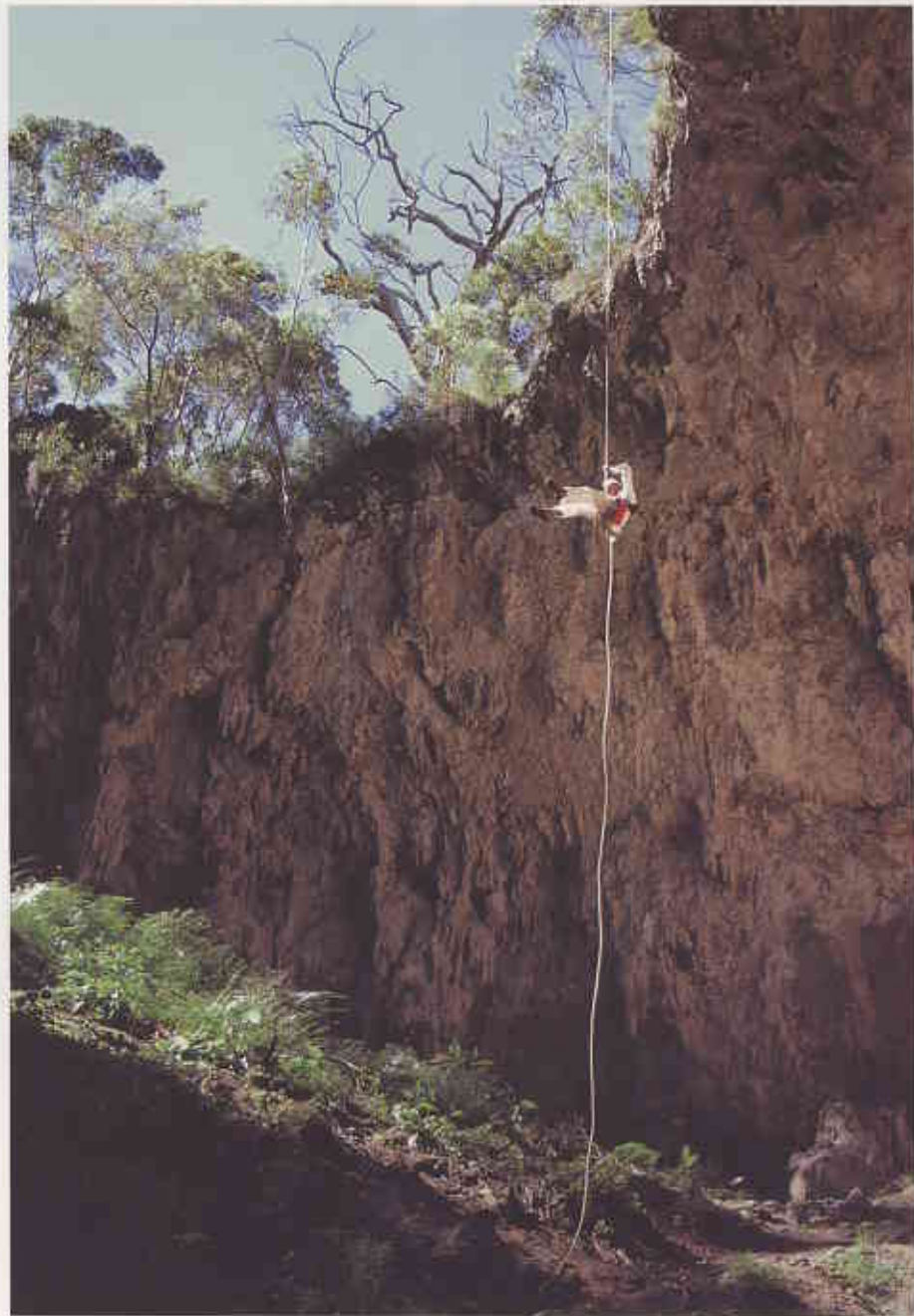
Calgardup Cave is open every day of the year (except Christmas Day) between 9.00 am and 4.15 pm. Because it is self-guided, visitors can vary the time spent in the cave to suit their own schedules and interests. Some find immense satisfaction in sitting in the dark listening to the total silence that is so rare in today's world. The only background noise in Calgardup is the odd water droplet landing on the floor.

At Calgardup, an Information Centre is located above ground adjacent to the car park. Here, friendly and

**Above:** Abseiling at Brides Cave, one of the most popular abseil sites. Brides Cave has a spectacular collapse doline about 30 metres in diameter and 30 metres deep. Photo – Peter Marsack/Lochman Transparencies

helpful guides can assist you with information about the cave and other features of the Leeuwin-Naturaliste National Park.

Six kilometres south of Calgardup, among the magnificent karri trees of Boranup Forest, Giants Cave awaits the more adventurous visitor. Sturdy footwear is a must for Giants Cave as visitors need to scramble over rock falls and negotiate a series of ladders. Although it is a cave of awesome





proportions, the route is clearly marked throughout and it is impossible to get lost. It is easy to imagine what a daunting experience the first explorer of Giants would have had! It is a cave for the more energetic, and is only recommended for children over the age of six. At 83 metres, it is one of the deepest caves in this district. It features extremely large chambers and provides a 'through' trip. You enter through a huge crater walled by limestone cliffs and, after passing through a series of chambers and some narrow sections, exit on the other side of Caves Road. The average trip through Giants Cave takes about an hour.

Giants Cave is open from 9.30 am to

**Above left:** Small shawls in Calgardup Cave.

**Above:** Access to this chamber is restricted to preserve its pristine beauty. Photos - Norm Poulter

**Below far left:** Ladder climb in Giants Cave.

**Below left:** Ticket and information office at Calgardup Cave. Photos - Michael James/CALM

3.30 pm during school holidays and long weekends. Please phone (08) 9757 7422 for opening times outside the holiday periods.

Major restoration programs have been undertaken in Calgardup and Giants Caves in the past five years. Soil slopes have been stabilised and calcite decorations have been cleaned. Infrastructure has been built to confine visitors to a limited area and to enhance

cave conservation and visitor safety. Once-muddied flowstones are now glistening, as waters rich in calcium carbonate continue to deposit calcite crystal. Tree roots, previously snapped off by careless visitors, are once again reaching towards the floor of the cave.

## THE FUTURE

These important initiatives over the past 10 years have improved protection of the caves of the Leeuwin-Naturaliste National Park. The introduction of the permit system, cave staff and Cave Leader Accreditation help to control the number of visitors to the caves and ensure that they behave in a manner that enhances cave conservation and safety. Caves are a valuable social and scientific resource. They are particularly vulnerable and require special management considerations to ensure their continued protection.



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CALM's Leeuwin-Naturaliste Information Centre is located on Caves Road, 15 kilometres south of Margaret River, phone (08) 9757.7422.



Winner of the 1998 Alex Harris Medal for excellence in science and environment reporting.

# LANDSCOPE



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Botanists rediscover a presumed extinct grass perched on the mountain tops of the Stirling Range National Park. See page 43.



How can we preserve the Leeuwin-Naturaliste caves while catering for increasing visitation? See page 16.



Salinity Strategy surveys are revealing that salinity threatens more than 850 Wheatbelt plant species. How can managers intervene? See page 36.



Discover Perth's eight regional parks and their special features and attractions on page 28.



Learn about the spineless wonders of the marine world and their clever disguises on page 42.

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## COVER

More than 160 different bird species use Cape Arid National Park, which lies on the South Coast about 120 kilometres east of Esperance. The red-eared firetail is one of them. This exotic-looking finch is confined to south-western Australia. It is found in areas of dense heath and undergrowth in thick forest, never too far inland. Cape Arid National Park is the eastern limit of its distribution.



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