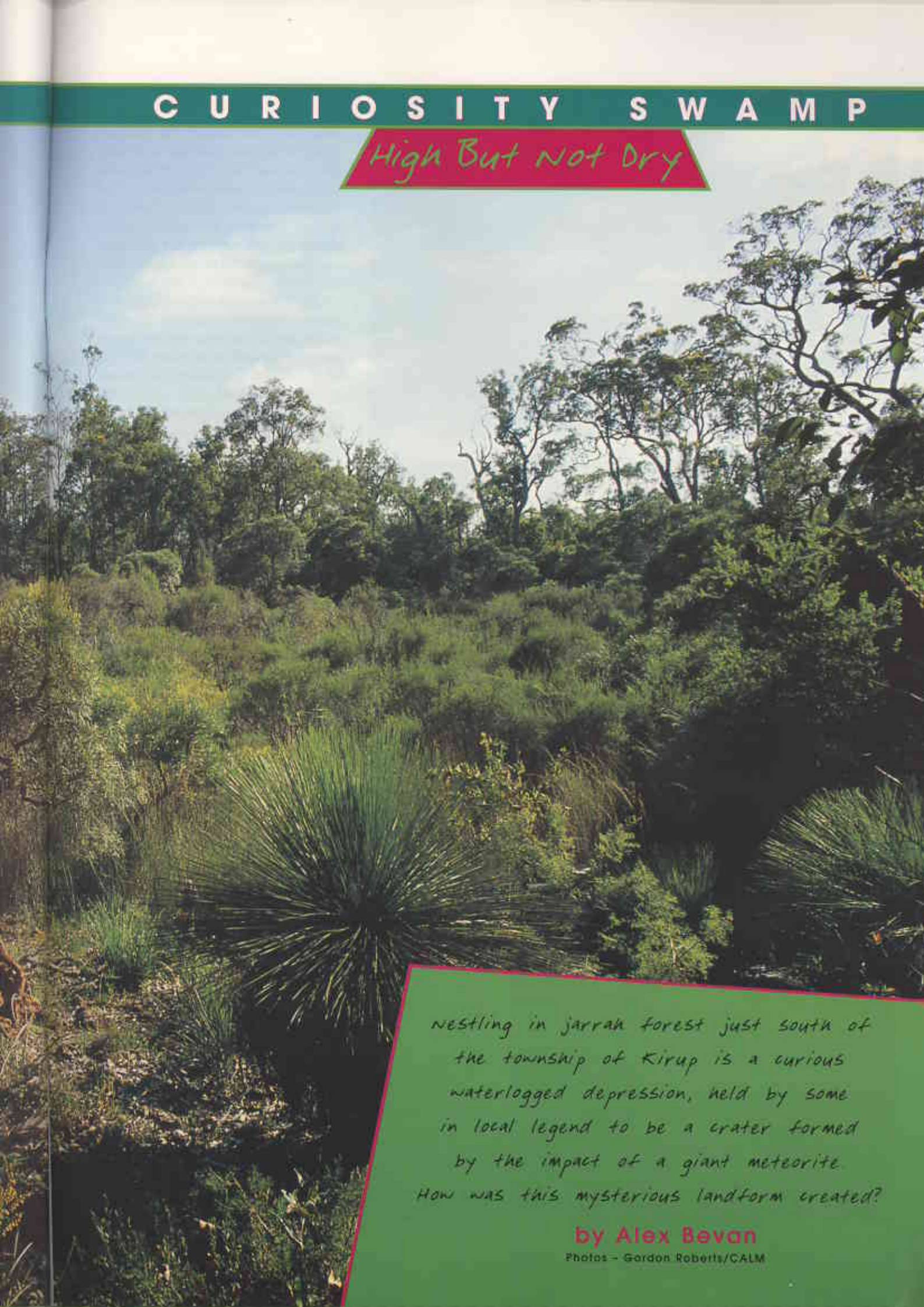
CURIOSITY SWAMP

High But Not Dry



Nestling in Jarrah forest just south of the township of Kirup is a curious waterlogged depression, held by some in local legend to be a crater formed by the impact of a giant meteorite. How was this mysterious landform created?

by Alex Bevan

Photos – Gordon Roberts/CALM

The aptly named Curiosity Swamp is perched on the crown of a small round-topped hill in State Forest managed by the Department of Conservation and Land Management (CALM). It is unusual to find a swamp perched on top of a hill. Moreover, the flora that the swamp supports appears quite alien to its immediate surroundings. The origin of this 50-metre-wide depression, however, is far more complicated and less dramatic than a simple whack from an invader from space. To understand how such a structure could form in that location, we have to look into the geological history of the moulding and erosion of the landscape over many millions of years.

Previous page
Curiosity Swamp has formed in a 50-metre-wide depression on top of a hill.

Below: The blue lady orchid (*Thelymitra crinita*) grows at Curiosity Swamp.

Below right: Drumstick isopogon (*Isopogon sphaerocephalus*).

GOING BACK IN TIME

Millions of years ago, the climate in the south-west was quite different from that which we enjoy today. More humid conditions prevailed all year round, and intense chemical weathering and leaching of the land surface gradually produced a capping of laterite on most rocks and deposits.

All along the Darling Range, and in many other places in the State, we can see reddish-brown or chocolate-coloured laterites sitting on the granites and other rocks from which they formed. The torrential downpours of rain that once percolated through the soil, removed silica and other soluble materials. What remained in these leached soils were highly stable oxides and hydroxides of iron and aluminium, which are not soluble in the soil water of humid climates. Excessive accumulations of earthy materials such as limonite (hydrous iron oxide) and bauxite (hydrous aluminium oxide) led to the formation of laterite, which eventually hardened as thick, irregular rock-like layers full of rounded nodules carpeting the terrain.

What has this got to do with Curiosity Swamp? Our first clue to the origin of the swamp is that it is formed in a thin layer of iron-rich laterite that caps the hill. The rocks beneath the laterite are ancient metamorphosed sediments. Only a few patches of this kind of laterite are found in the immediate vicinity, but it was once more widespread. During the major period of laterite formation in the area, erosion continued. Gradually, rivers and creeks cut their way through the laterite and underlying rocks, sculpting the land into the valleys and residual hills we see today.

AN OLDER TERRAIN

The hill on which Curiosity Swamp sits is one of the highest found in the divide between the headwaters of the

Capel River, which flows to the north-west, and the Blackwood River, which flows to the south-west. These drainage systems and their tributaries are largely responsible for moulding the landscape we see in the area around Kirup and Balingup today. In some places, the laterite has been completely eroded away; in others, it may never have been formed. A few patches, like the one at Curiosity Swamp, remain as testimony to an older terrain and past climatic change.

The oldest superficial deposits now occupy the highest spots in the landscape. On that ancient surface, erosion produced humps, hollows and creeks, much as it does today. Local drainage systems developed, eventually drying up and leaving a series of depressions. Laterisation of the rocks and deposits continued. Some of these depressions gradually became lined with mud, clay and humus, and periodically held water. Small swamps were formed and developed their characteristic flora. Other similar shallow depressions can be seen in the laterite capping in areas of the Darling Range today. Characterised by melaleucas and fringed by swamp banksia (*Banksia littoralis*) and grass trees (*Xanthorrhoea priessii*), Curiosity Swamp is a haven for frogs and a larder for tiger snakes. Although these areas largely dry out in summer, they still retain their swamp-like appearance.

So our mystery is nearly solved. What remains is an explanation of how we can discount the meteorite impact theory. Small meteorite craters have distinctive shapes with raised rims formed by upturned rocks. The laterite at Curiosity Swamp dips gently to the north and, other than from the roots of trees, appears otherwise undisturbed. And whereas recently formed craters generally have fragments of the meteorite projectile associated with them, none has been found at Curiosity Swamp. Finally, the intense shock associated with the formation of an impact crater leaves distinctive microscopic damage in the minerals of the target rocks. These have not been found in the rocks at Curiosity Swamp.

Gradual isolation of the swamp may have preserved a relict flora and fauna, that is possibly unique and worthy of study and conservation. We often underestimate the power of the relentless forces of weathering and erosion that have produced the landscape and that continue at a gentle pace today. It was in this way that Curiosity Swamp was left high, but not so dry!

Top: A bobtail skink shelters in lateritic rocks in which the swamp has formed.

Above: There is a fringing vegetation of jarrah and grass trees (*Xanthorrhoea priessii*).

Right: Fragments of a meteorite have never been found at Curiosity Swamp.

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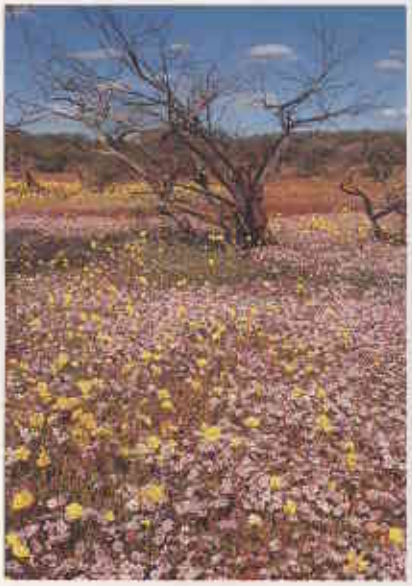
Dr Bevan thanks John Dell, Mark Cowan and George Kendrick for their help.

The waters off Western Australia's south coast are home to a rich diversity of marine plants and animals. Read about them on page 28.



Burnerbinmah Station, in WA's Murchison Region, fills an important gap in the State's flora and fauna reserve system. See page 42.

LANDSCOPE

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Was it created by a meteorite crashing to Earth, or more slowly over time? Find about Curiosity Swamp on page 50.

Imagine a commercially-owned and managed sanctuary in the hills east of Perth and you have 'Karakamia Sanctuary'. Find out how it was created on page 17.

The Western Blue Gum, a commercial variety of the Tasmanian bluegum, was developed for WA conditions, but tree breeders continue to improve the strain. See page 36.

FEATURES

REGULARS

COVER

Is the forest red-tailed black-cockatoo rare or just rarely seen? Find out the answer to these questions on page 10.

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