Why is Lake Richmond important?

WA contains the greatest number and most diverse array of microbial structures known anywhere on Earth. Perhaps the best-known structures built by microbes are the world-renowned stromatolites at Hamelin Pool, Shark Bay. Lake Richmond contains limestone structures similar in appearance and function to those at Shark Bay. The structures at Lake Richmond are thrombolites — those that have a clotted internal structure as opposed to those that have a layered structure, which are stromatolites.

As at Shark Bay, the microbial community that forms the limestone structures in Lake Richmond is a complex association of several species of bacteria and algae that, while growing, remove dissolved minerals (calcium carbonate) from the water and build up new 'rock' material, resulting in the formation of the obvious domed rock-like formations. Lake Richmond contains the only known example of this particular Critically Endangered microbial community. Critically Endangered means that it faces total destruction in the immediate future if threats are not managed.

Microbial communities similar to those at Shark Bay and Lake Richmond are believed to have been crucial in the history of the Earth. Fossilised stromatolites are the earliest record of life on Earth and it is believed that the bacteria that form these structures were the dominant form of life from 3.5 billion to 600 million years before present (the Pre-Cambrian period). Stromatolites occurred when the Earth's atmosphere was too hostile to support life as we know it. The bacterial community that forms stromatolites and thrombolites is believed to have been responsible for generating the first atmospheric oxygen, thereby making the biosphere habitable for all other life. This is perhaps the most critical event in the Earth's history.

Plant community in danger

Lake Richmond is also surrounded by another critically endangered community — the 'Sedgelands in Holocene dune swales', that surround the water's edge. The particular community is only known from a total of about 132 ha. This sedge community is also especially important as a filter for any pollutants that would otherwise flow into the lake.

Critically Endangered community. Photo – Val English

The sedgelands that surround Lake Richmond are also a

If you would like more information about the microbial community in Lake Richmond, please contact CALM's **Swan Region office** on **9368 4399** or the **Naragebup Environment Centre** on **9591 3077.**

Where is Lake Richmond?

Lake Richmond is immediately inland of Point Peron, between Safety Bay Road and Parkin Street in the City of Rockingham. It includes a City of Rockingham reserve for conservation and public recreation, land owned by the Western Australian Planning Commission that covers about a quarter of the lake bed and an area of foreshore that may be added to the City of Rockingham reserve.

Fire in buffer vegetation can be a major threat to water quality in the lake. Photo – Bob Goodale

Front cover and above
Thrombolites in Lake Richmond. Photo – Bob Goodale

Congratulations!
You live near a very significant lake

The threatened microbial community of Lake Richmond

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GOVERNMENT OF WESTERN AUSTRALIA
DEPARTMENT OF Conservation AND LAND MANAGEMENT
Conserving the nature of WA
Natural Heritage Trust

Important birds

There are also a number of significant migratory bird species that use Lake Richmond on a seasonal basis, for example, common greenshanks (*Tringa nebularia*) and red-necked stints (*Calidris ruficollis*). These birds are protected under international agreements between Japan and Australia, and China and Australia.

Aboriginal significance

Aboriginal beliefs relate to Lake Richmond. A member of the local Naramya Aboriginal Corporation is consulted about management planning for the lake and also provides information about Aboriginal culture for lake visitors. Structures that resemble fish traps and may have been constructed by Indigenous people have been identified in the lake and management of the lake will not damage these.

Microbial community in danger

The health of Lake Richmond and its microbial community are under threat from declining water quality as a consequence of some land uses around the lake, such as residential developments and runoff from roads. In addition, when the microbial structures become exposed during summer, they are fragile and very vulnerable to crushing underfoot. Too frequent fire can also impact the microbial community by increasing flows of sediment that can smother the microbial community and cause a decline in the water quality.

The microbial structures in Lake Richmond are very vulnerable to crushing underfoot. Photo – Val English

Recovery of this threatened ecological community

The Department of Conservation and Land Management (CALM) is committed to ensuring that Critically Endangered ecological communities are not destroyed. This is done through the preparation of Interim Recovery Plans, which outline the recovery actions that are required to urgently address threatening processes most affecting the ongoing survival of threatened ecological communities in the wild and begin the recovery process.

CALM has set up a Recovery Team for the microbial community of Lake Richmond to coordinate the implementation of recovery actions that address the greatest threats to the survival of the community. This team consists of representatives from CALM, the Naragebup Environment Centre that manages the lake on behalf of the City of Rockingham, the City of Rockingham and various government agencies.

Recovery actions that have been, and will be, progressively implemented to protect the threatened ecological community include:

- monitoring the health of the lake and the microbial community;
- ensuring developments on adjacent lands have minimal impact on the lake;
- ensuring that current water quality and levels are maintained; and
- seeking to prevent fire from occurring too frequently in buffer vegetation around the lake's edge.

You, as a near neighbour, are vitally important in protecting this precious lake.

What can you do to look after this important lake?

Don't walk on the thrombolites.

The structures are fragile and easily crushed underfoot.

Keep to the tracks.

Walking off the tracks can crush vegetation that provides a buffer to the lake.

Report fires.

Fires have a huge effect on sedgelands that provide a buffer to the lake and help to prevent pollutants entering the waters. Please report all fires or any unusual behaviour that could relate to arson to the Fire and Emergency Services Authority.

Don't put it down the drain.

Chemicals such as oil can end up in the drains into Lake Richmond and other wetlands. Dispose of liquid wastes properly.