CRITICALLY ENDANGERED THROMBOLITES

Microbialites are formed by a complex group of microbes that photosynthesise and precipitate out calcium carbonate (limestone) to form odd rock-like structures. These structures are evidence of the oldest life on Earth and are therefore of great scientific interest. They provide evidence of historical environments through information held within their structure. Worldwide, these structures are restricted to a few areas including the Bahamas, Bermuda and Western Australia. Western Australia contains the oldest microbialite fossils, at 3.5 billion years. The State also contains the greatest number and most varied types of living microbialites in the world.

Thrombolites in Lake Clifton. Photo – Val English

Microbiolites come in different forms. Those with a clotted internal appearance are called 'thrombolites'. Thrombolites have existed for at least 570 million years (since early in the Phanerozoic era). They were the most dominant living marine structures at this time as they were more resistant to grazing and burrowing animals. Around 395 million years ago however, faster-growing marine organisms such as corals and macroalgae led to the decline of the thrombolites as a result of competition for space.

Thrombolites are known from several lakes in the south west of WA—including Lake Richmond in Rockingham, and Lake Clifton south of Mandurah. They are also subject to a number of threats and are listed as Threatened Ecological Communities.

Thrombolites are continuously growing and are dependent upon a continuous discharge of groundwater into their habitat. This groundwater needs to be low in salinity, high in alkalinity and low in nutrients. Nutrients leaching into the groundwater from agricultural and urban land use in the catchments is also impacting on the water quality in both of the Lakes. Algal blooms have already been observed in Lake Richmond and Lake Clifton.

The use of the lake's catchments for agriculture or housing, results in an increase in groundwater usage. This can cause an upwelling of the saline water that underlies the fresh groundwater, and has the potential to impact on the salinity of the lakes. This may have caused the large increase in the salinity of Lake Clifton recorded in the early 1990s.

Other threats to the thrombolites include crushing by visitors, pollutants, altered groundwater flowthrough, increased runoff due to clearing in the catchments, alterations to surrounding vegetation, smothering by weed infestations or by sediment, and at Lake Richmond rubbish dumping, the influx of rubbish through drains, and road construction.

The Department of Conservation and Land Management (the Department) has set up the Swan Region Threatened Flora and Communities Recovery Team to coordinate the implementation of recovery actions that address the greatest threats to threatened communities in the wild. The management of Lake Richmond is actively undertaken by the Rockingham Regional Environment Centre. A specific Recovery Team for the Thrombolites of Lake Richmond has also been set up, and another which will specifically oversee the implementation of the recovery actions for the Lake Clifton thrombolites, will be established in the future.

For further information please contact the Department's Swan Coastal District Office on (08) 9405 1222.

Recovery
of threatened ecological communities

The Department of Conservation and Land Management (the Department) is committed to ensuring that Threatened Ecological Communities are not totally destroyed. This is done through the preparation of an Interim Recovery Plan (IRP), which outlines 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.

IRPs are prepared by the Department and implemented by Regional or District Recovery Teams consisting of representatives from the Department, community groups, private landowners, local shires and various government organisations.

Recovery actions that have been, and will be, progressively implemented to protect the Threatened Ecological Communities include:

Protection from current threats:

Construction of boardwalks, weed control, and the removal of rubbish; transfer of care, control and management of the portion of the lake that was privately owned at Lake Richmond to the Crown for Conservation and Public Recreation, regular monitoring of water quality and levels, and general health of the community in both Lake Richmond and Lake Clifton.

Protection from future threats:

For Lake Richmond - rehabilitation of native vegetation buffers and development of a drainage strategy; and for both lakes, ensuring that relevant authorities, landowners and the Department's personnel are aware of the presence of the thrombolite communities and the need to protect them, and that all are familiar with the threats that will be identified in the Interim Recovery Plans.

IRPs will be deemed a success if the water quality and levels are maintained or improved in Lake Richmond and Clifton, and the vigour and extent of the microbial communities including the composition of the microbial species are maintained.

Weeds encroaching into the vegetated buffer for the thrombolite community at Lake Richmond. Photo – Val English

Crushing by recreational users is a serious threat to the thrombolites. Photo – Val English

The boardwalk constructed at Lake Clifton helps prevent crushing of the thrombolites. Photo – Stephen Dutton

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