



Stromatolite like freshwater microbialite community of coastal brackish lakes (Lake Clifton)

Summary description

The community occurs on a relict foredune plain on Holocene sands at Lake Clifton. It is a thrombolitic community comprising a complex assemblage of photosynthetic cyanobacteria and purple sulphur bacteria, eukaryotic microalgae and true bacteria. The thrombolitic structures generally have an internal clotted structure and are formed through precipitation of calcium carbonate within the microenvironment of microbes as a result of photosynthetic and metabolic activity. The most abundant cyanobacterium in the early 1990s were species of *Scytonema*, as well as others including *Oscillatoria*, *Dichothrix*, *Chroococcus*, *Gloeocapsa*, *Johannesbaptistia*, *Gomphosphaeria* and *Spirulina* (Moore L.S. 1993, *The modern thrombolites of Lake Clifton, south-western Australia*, unpublished doctoral thesis, The University of Western Australia). More recent work suggests there has been a dramatic shift in the cyanobacterial population.



Distribution

The thrombolites extend along the eastern side of Lake Clifton, forming a reef approximately 10km long, in Yalgorup National Park, south of Mandurah.

Department of Biodiversity, Conservation and Attractions (DBCA) Region: Swan
DBCA District: Swan Coastal

Local Government Authorities: City of Mandurah, Shire of Waroona

Habitat requirements

The thrombolite community depends on a continuous discharge of groundwater, rich in calcium, bicarbonate and carbonate, low in salinity and nutrients, and high in alkalinity.

Indigenous interests

Traditional Owner group: Pinjarup Noongar

A register of Aboriginal cultural heritage sites kept by the Department of Planning, Lands and Heritage currently lists one site of Aboriginal significance in the vicinity of this community.

The area is covered by the Gnaala Karla Booja Indigenous Land Use Agreement as part of the South West Native Title Settlement, which formally recognises Noongar people as the Traditional Owners of the south-west region. The Gnaala Karla Booja region is supported by the Gnaala Karla Booja Aboriginal Corporation and umbrella group, the South West Aboriginal Land and Sea Council.

Conservation status

State: Listed as a critically endangered ecological community under the *Biodiversity Conservation Act 2016*. Threatened ecological communities are declared environmentally sensitive areas under the *Environmental Protection Act 1986*.

National: Listed as critically endangered under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* as 'Thrombolite (microbialite) Community of a Coastal Brackish Lake (Lake Clifton)'.

Threatening processes

The major threats include declining water levels and elevated salinity due to increased groundwater extraction and altered groundwater flows, increasing nutrient levels and other pollutants derived from adjacent agricultural and rural-residential properties, physical crushing, weed invasion, fire, and introduced fauna.

Recovery plan

An interim recovery plan has been produced for this community, outlining the recovery actions that are required to reduce threats and maintain or improve its overall condition. Priority actions include managing access to the thrombolites, providing advice to landholders and managers on ways to avoid land use activities that are likely to be detrimental to the thrombolites, monitoring water level and quality, and biological studies of the microbial community. Other recovery actions include maintaining the vegetation buffer surrounding the lake including weed control and maintaining firebreaks.

Key references

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