



Cape Range Remipede Community (Bundera Sinkhole)

Summary description

The community is known from the Bundera Sinkhole, which is a landlocked body of water with a subterranean connection to the ocean (an anchialine cave). Anchialine ecosystems are inland underground mixohaline waters (seawater dilutes of variable salinity) affected by marine tides, usually with little if any surface exposure. The community comprises a rich stygobitic faunal assemblage composed primarily of crustaceans but also includes a blind fish, *Milyeringa veritas* (blind gudgeon). The crustaceans include atyid shrimp, ostracods, gammarid amphipods, diverse copepods and the remipede *Kumonga exleyi* of the crustacean class Remipedia (a class of blind crustaceans).



Distribution

A single occurrence of the community is known from the Bundera Sinkhole, located within the Exmouth region on the western coastal plain of the Cape Range peninsula (North West Cape).

Department of Biodiversity, Conservation and Attractions (DBCA) Region: Pilbara
DBCA District: Exmouth

Local Government Authority: Shire of Exmouth

Habitat requirements

Bundera Sinkhole provides an anchialine habitat with water low in oxygen below a density-induced layer (thermo-halocline) separating brackish surface and deeper saline waters. This sinkhole is the only deep anchialine system known in Australia, and the only continental anchialine system known in the Southern Hemisphere. Where anchialine systems occur in water-filled sinkholes, as in Bundera Sinkhole, they typically have a freshwater layer overlying seawater that results in a stratified photosynthetic zone and physical and chemical (physico-chemical) profile. These complex physico-chemical conditions are vital to the occurrence and survival of stygofauna and are easily disrupted.

Indigenous interests

Traditional Owner groups: Baiyungu, Thalanyji, Yinggarda

The North West Cape Exmouth Aboriginal Corporation is represented on the North West Cape Karst Management Advisory Committee who assisted in drafting and implementing the interim recovery plan for the community.



The community occurs on the Warnangura (Cape Range) Cultural Precinct, which encompasses Cape Range Peninsula and is recognised as an area of significance in a register of Aboriginal cultural heritage sites kept by the Department of Planning, Lands and Heritage.

The Yamatji Marlpa Aboriginal Corporation represents the Traditional Owners and is the native title representative body for the Pilbara region.

Conservation status

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

National: The community occurs within the Ningaloo Coast National Heritage listed place, protected under the *Environment Protection and Biodiversity Conservation Act 1999*.

Threatening processes

The community is known from a single occurrence that due to its small size and proximity to tracks, is extremely vulnerable to catastrophic events. The main threats to the community include dumping of rubbish or toxic waste, disturbance of the layers in the waterbody (for example, by diving), introduction of exotic species and particularly feral fish, and eutrophication or pollution of the water body in the cave.

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. Recommended actions include liaison with authorities and land users to avoid over abstraction of water in the Cape Range aquifer; implementing an access management plan; controlling feral fish; excluding stock from the vicinity of the cave; declaring Bundera Sinkhole and a buffer zone a Commonwealth reserve; monitoring and managing stygofauna, water quality and levels; ensuring land use planning and development controls protect the community; and controlling feral goats on the peninsula.

Key references

Adams, M. & Humphreys, W. F. (1993). Patterns of genetic diversity within selected subterranean fauna of the Cape Range peninsula, Western Australia: systematic and biogeographic implications. *Records of the Western Australian Museum*, Supplement 45, 145–164.

Black, S., Burbidge, A. A., Brooks, D., Green, P., Humphreys, W. F., Kendrick, P., Myers, D., Shepherd, R., & Wann, J. (2001). *Cape Range Remipede Community (Bundera Sinkhole) and Cape Range Remipede: Interim Recovery Plan 2000–2003* (Interim Recovery Plan No. 75). Department of Conservation and Land Management.

Humphreys, W. F. (1999). Relict stygofaunas living in sea salt, karst and calcrete habitats in arid northwestern Australia contain many ancient lineages. In W. Ponder & D. Lunney (Eds.), *The Other 99%: The Conservation and Biodiversity of Invertebrates* (pp. 219–227). Transactions of the Royal Zoological Society of New South Wales.

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