

# MANAGEMENT OF STYGOFAUNA IN WESTERN AUSTRALIA

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## EXTENDED ABSTRACT

Groundwater aquifers in Western Australia contain diverse and highly significant faunas of obligate subterranean aquatic species (stygo fauna). Its importance is recognised in the common requirement by the Environmental Protection Authority (EPA) to take cognisance of stygo fauna in environmental approval processes. The stygo fauna is dominated by various groups of Crustacea, which includes numerous ancient and relict groups, but oligochaetes, mites, beetles and fish are also represented. The stygo fauna is widely distributed in limestone and calcrete aquifers, as well as riverine interstitial habitats and fissured sandstone aquifers. The major threat to stygo fauna is lowering of the watertable, usually associated with groundwater pumping and/or mine dewatering, but stygo fauna is also threatened by aquifer pollution and salination.

Two major categories of stygo fauna communities occur in Western Australia. Those in the near shore basin areas with a predominantly marine derived anchialine fauna (Cape Range, Barrow Island and other basin areas). And those on the cratons comprising predominantly ancient freshwater lineages (Pilbara, Yilgarn, Kimberley). At Cape Range, the anchialine habitat and associated fauna is threatened by groundwater abstraction and other developments that may cause disruption to the Ghyben-Herzberg hydrological system. At Barrow Island, localised pollution of the aquifer by petroleum hydrocarbons has resulted from leaks and inappropriate disposal methods. Borefields and mine dewatering operations in the Pilbara, Kimberley and Yilgarn could threaten the survival of stygo fauna in shallow calcrete and limestone aquifers. Aquatic invertebrate communities

associated with root mats in caves at Yanchep and Margaret River have become endangered as a result of persistent watertable lowering over the past 30 years.

Conservation of stygo fauna primarily depends upon maintaining the hydrologic system by maintaining watertable levels and minimising drawdown effects, and managing pollutants, but changes at the surface, such as land clearance and paving, could be important in the long term. At Barrow Island, the disposal of waste fluids including petroleum hydrocarbons has been modified from shallow disposal to a deeper injection system. At Yanchep, endangered root mat communities have been preserved by artificial deepening of stream cave pools, and by installing a float-activated pump system that automatically recharges pools as they dry up. At Margaret River, a coupe of pine trees was felled in an attempt to increase water infiltration rates to the underlying cave stream. The recovery plan for the endangered communities at Margaret River involves monitoring of cave water levels and a contingency for direct recharge if necessary. At Cape Range, stygo fauna is monitored as a potential indicator of groundwater quality. Management planning for the West Angelas minesite has involved the siting of water supply bores at locations, which will minimise drawdown effects to known stygo fauna habitat. Recent research and management initiatives relating to mine dewatering proposals in the Pilbara and Yilgarn have focused on resolving the taxonomy of key groups as indicators of drawdown effects, and establishing long term monitoring programs for stygo fauna.

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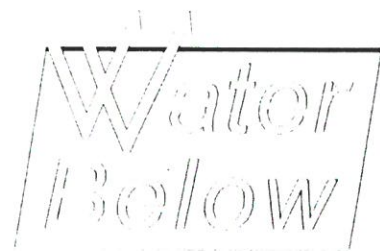
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