



## **Karst System and Cave Fishes of Exmouth Gulf**

### **What is Karst?**

Within the Cape Ranges, where limestone has dissolved underground due to natural environmental influence, caves and waterways have formed. This happens over a long period of time when chemical and environmental factors interplay. The caves and waterways are known as karst systems and can connect to the ocean (anchialine systems). The enormous caves and thousands of kilometers of tiny waterways harbour creatures that have never seen sunlight (stygofauna). Karst systems provide an interface between outside and inside worlds.

### **Why is the Cape Range Karst special?**

One of the criteria for becoming the Ningaloo World Heritage Area was that there was no other comparable, complete and integrated limestone system in existence. The features of this area date from the Palaeocene (65 - 54 million years BP) to Holocene (15,000 years to the present). They represent the changing environmental conditions over millions of years and include the formation of the reef. There are more than 500 caves, and some are more than 100m deep.

### **Cape Range flora and fauna**

Limestone ranges are generally poor in species diversity, but the Cape Range area has an unusually high diversity of flora. Both tropical and temperate plants exist here, and more than 600 different species.

Stygofauna in the Cape Range system includes the Blind Gudgeon fish and Blind Cave Eel, not found anywhere else in the world (endemic). Other rare species include the Atyid shrimp, Crustaceans and the Cape Range Remipede. This karst system also has the richest and most diverse Troglotic community in Australia.

### **Why do we need to protect it?**

The Cape Range karst system is unique and extensive, above and below the ground. The area provides not only a beautiful setting for the town of Exmouth, but the economic resources of the karst system play a major role in encouraging human use of the environment, including the use of groundwater and the tourism industry. The Cape Range karst system offers a unique opportunity for scientific research and education, and findings from research will have local and regional implications. It is also an amazing outdoor classroom because of the range and time-scales of its landscape.

### **Major Threats**

This system is tidally influenced and has limited recharge both from a low hydraulic gradient and low rainfall. Pollution of the Cape Range subterranean waterways or aquifers is a serious concern to the survival of subterranean fauna and karst processes. Pollution and over-abstraction will impact human settlement in this area.

### **Further reading**

Elery Hamilton-Smith, Kevin Kiernan and Andy Spate (1998). Karst Management Considerations for the Cape Range Karst Province, Western Australia: A report prepared for the Western Australian Department of Environmental Protection.

Moya Tomlinson and Andrew J. Boulton (2010). Ecology and management of subsurface groundwater dependent ecosystems in Australia. *Marine and Freshwater Research* **61**, 936–949.