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Review of the Subterranean Biodiversity of the Nullarbor Plain, Southern Australia.

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The Nullarbor Plain covers an area over 200,000 km2 and is one of the largest areas of continuous exposed karst in the world. Scientific documentation of the caves and biological collections commenced in the late 19th century although much of this earlier information on caves and cave fauna has remained scattered in scientific journals, unpublished reports, museum collections, speleological databases and private records. This has hindered integration and coherent assessment of the region's karstic and subterranean biodiversity values, needed for informed conservation management of this highly significant karst area. The purpose of this study was to compile an inventory of caves and karst features, and develop a preliminary characterization of subterranean biodiversity values, including knowledge gaps and future research needs.

Presently, more than 687 caves and nearly 3,000 other karst features (dolines, blowholes, rock shelters, etc) have been recorded, of which approximately 200 have had biological collections. The compiled database of biological collections comprised nearly 2,000 occurrence records of 309 provisional taxa belonging to 134 families. Invertebrates comprised 90% of these records, with bats and birds representing the remainder. The most well represented invertebrate taxa were arachnids (157 taxa), followed by insects, crustaceans, and myriapods. The overall taxonomic resolution was low, with less than one-half (49%) of the fauna identified to species level, however, the obligate subterranean fauna known to date comprises at least 26 species in 19 genera. Stygobionts are conspicuously absent from most Nullarbor caves despite the presence of large saline lakes in about a dozen caves. Stygobionts with marine affinities have been recorded from caves on the Roe Plain, a portion of the Nullarbor karst which was subject to a marine transgression in the Pliocene-Early Pleistocene.

To assist with setting conservation priorities, the caves were assigned a preliminary biological importance ranking based on a combination of obligate species richness, total species richness, and cave length. This study identified major gaps in taxonomic knowledge, geographic sampling coverage, and reservation status for biologically important caves, and highlighted the need for further systematic surveys.