17. POSTER FOR COMPETITION

Combining approaches to identify biodiversity hotspots in Western Australia

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Recognition of plant diversity hotspots is of great value for conservation planning and helps gain public support for conservation initiatives. The entire Southwest Australian Floristic Region (SWAFR) is an internationally recognised plant biodiversity hotspot. However, in Western Australia additional hotspots have been designated at overlapping spatial scales without using consistent criteria. Areas are recognised as sub-regional hotspots (by the commonwealth) include the Stirling Ranges, northern sandplains, Fitzgerald River bioregion and Mitchell Plateau. However, we are aware of other areas of similar conservation significance, both inside and outside the SWAFR, that are not currently recognised as hotspots. Thus updated mapping of all areas of exceptionally high biodiversity using reliable and reproducible processes is required to guide conservation efforts.

Hotspots are defined by exceptionally high diversity, endemism and evolutionary importance, so plant surveys and specimen records are required to identify them. We employed four different approaches to identify hotspots and provide case study for each method. These are bioregional studies, diversity mapping, phylogenetic mapping and species area relationships.

Most hotpots occur in areas where complex landform, soils and hydrology support diverse habitats. They are also areas with high rates of speciation and/or survival of plant taxa and have functioned as refugia from climate change. Continuing advances in biological surveys, plant taxonomy and assessments of plant diversity, especially in areas threatened by mining have revealed several new hotspot areas. These include parts of the interzone at the eastern boundary of the SWAFR and south of Perth along the Whicher Scarp, Cape Arid /Nuytsland on the southeast margins of the SWAFR and the paleodrainage areas of the Kimberley and adjacent desert. These data also suggest that some rather broadly based hotspots such as the Wheatbelt, Pilbara and Geraldton Sandplains could be more finely divided.

Species area relationships can help to define diversity hotspots by revealing areas with higher than expected species richness and endemism. Analysis of species occurrence data can also identify areas with high values using diversity metrics such as species endemism, richness or turnover to help identify areas potentially of priority for conservation. This approach is becoming more powerful due to specialised software and models that efficiently define areas where diversity is high, as well as very large accessible species databases. We also acknowledge problems with identifying hotspots due to the limitations of existing data resources, changing taxonomy, spatial uncertainty of records, poor sampling in remote areas and the large scale of analyses. Additionally, while these methods can identify spatial regions of importance our understanding of the processes that define them will require additional phylogenetic, evolutionary, paleobotanical and paleoclimatic studies.

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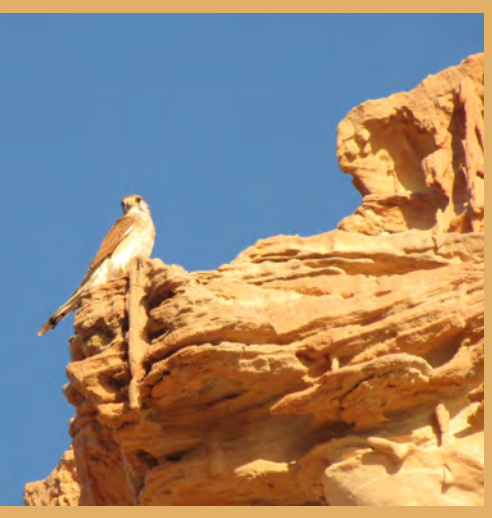


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