Department of Environment and Conservation
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Information Sheet 23 / 2009
Science Division

Floristic surveys of the Banded Ironstone Ranges

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Background

Work undertaken by DEC and others in the early 1990s indicated that some of the Banded Ironstone Formation ranges of the Yilgarn were a repository for localized endemic plant species and restricted vegetation communities. These ranges are small ancient features scattered across the Eastern Goldfields and are situated well south of the major iron ore producing region of the Pilbara.

Following the rapid expansion of iron ore exploration and mining on these ranges in the early part of this century, DEC funded an expanded survey program to document the biodiversity values of these ranges. The primary purpose of these surveys were to provide a regional basis for the assessment of future development proposals and provide input into regional land use planning initiatives. Between 2005 and 2008 some 24 ranges were surveyed. These surveys initially concentrated in areas of high mineral prospectivity but now cover a wide cross-section of Banded Ironstone Formation ranges across the Eastern Goldfields.

Findings

A total of 1 215 quadrats were established across the 24 ranges. In total 21 new species were identified, new populations of more than 100 Declared Rare Flora and Priority listed plant species were located, and restricted vegetation communities have been found on at least five ranges. In addition, 6 244 voucher collections have been lodged in the Western Australian Herbarium and 24 reports and associated datasets on the vegetation and flora of each range has been released to the public and industry.

In a related DEC project, a special issue of the taxonomic journal *Nuytsia* was published in 2007. This special issue included

descriptions of 36 species that occur on these Banded Ironstone ranges or in other ironstone habitats, 17 of these species are restricted to, or had their distributions centred on, these ranges.

Preliminary analysis of the patterns of endemism supports the hypothesis that these ranges represent both refugial habitats of great antiquity and are also areas of recent speciation. However, not all of the ranges support endemic or threatened taxa. Interestingly, those that support most occur close to the boundary of the South West Botanical Province, a major biogeographic boundary between the wetter, highly species diverse south west and the more arid interior.

In terms of vegetation composition the mid and upper slope communities are those communities which are mostly different between ranges. There also seems to be an unfortunate but high correlation between areas with the highest concentrations of endemic and threatened flora coupled with the presence of restricted vegetation types and the occurrence of highly prospective iron ore geology and thus sites for possible mine developments.

Management Implications

As a result of this strong correlation between conservation values and the most valuable mineral deposits, detailed biological information will be needed to properly assess resource development proposals. The distribution of many threatened species and / or species with very narrow geographic ranges has already placed major constraints on some current and proposed mining developments.

The high variability between ranges in terms of vegetation composition and the rapid change over of restricted taxa along the boundary of the South West Botanical Province also makes the achievement of a comprehensive, adequate and representative reserve system challenging.

These ranges remain fascinating ancient refugia where species have survived the climatic fluctuations of the past and where speciation into novel restricted species is occurring today.

This research was funded by the DEC Biodiversity Conservation Initiative.

Produced and published by the Science Division, Department of Environment and Conservation, Western Australia,
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