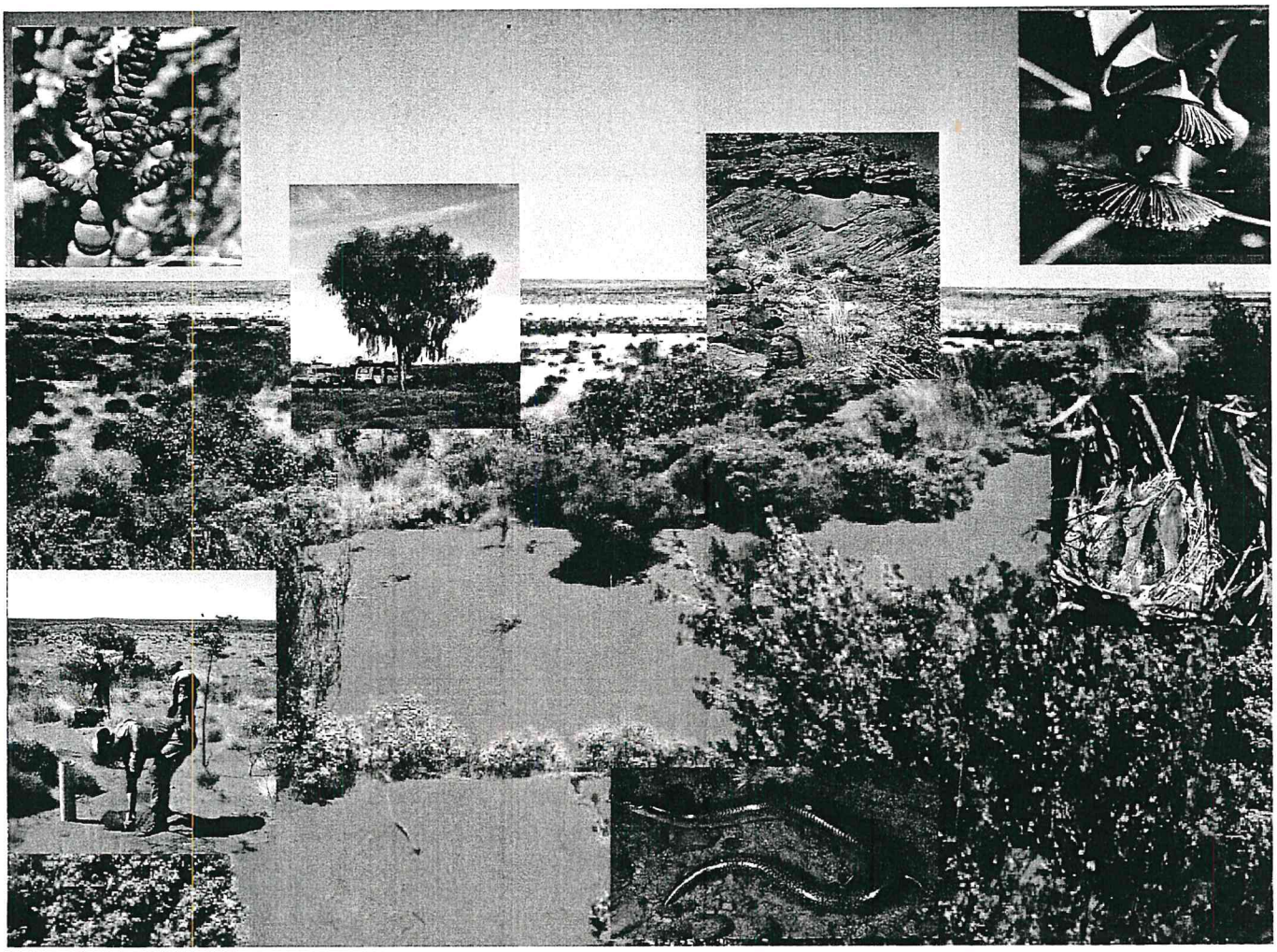
Biological survey of the south-western Little Sandy Desert

NATIONAL RESERVE SYSTEM PROJECT N706

FINAL REPORT – JUNE 2002



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Government of Western Australia

DEPARTMENT OF Conservation AND LAND MANAGEMENT
Conserving the nature of WA

Chapter 7

CONCLUSIONS AND RECOMMENDATION

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Knowledge of the flora and the fauna of the Little Sandy Desert Biogeographical Region is rudimentary. The Desert is one of the least accessible and undoubtedly one of the least known natural regions in Western Australia. Most of what biological knowledge is available has been obtained from localities that have attracted substantial scientific and public interest because of their mineral prospectivity, scenic grandeur, historical significance or charisma with respect to nature-based tourism. Such localities include Lake Disappointment, the Rudall River National Park, the Canning Stock Route and its associated wells, springs and ranges and the Throssell, Broadhurst and Carnarvon Ranges. Interestingly, what biological information is known for the Desert is concentrated on its northern and southern margins and a central corridor, although arguably the biota in eastern parts of the region is somewhat appreciated given the State's knowledge of the Gibson and south-eastern Great Sandy Deserts. An obvious knowledge gap in the Little Sandy Desert is to be found along its western and south-western margins. This shortcoming was eloquently and unequivocally illustrated in 1991 when Australia's only presumed extinct eucalypt (*Eucalyptus rameliana*) was rediscovered and shown to be a ubiquitous and dominant component of dune field and sand plain communities on the western fringe of the Desert (Hopper 1992). This biological survey is the outcome of this rediscovery and the synchronous realisation that as a natural region, the Little Sandy Desert is a high priority for biological inquiry to redress issues of inadequacy and bias in conservation reservation (Thackway and Cresswell 1995),

The south-western portion of the natural region epitomises the remainder of the Desert in respect to the preponderance of eolian sand dunes and sand plains interspersed with resistant sandstone uplands and rolling lateritic rises. These features are vegetated broadly by scattered emergent eucalypts, low *Acacia* woodlands, mallee, *Acacia*, *Grevillea* and ericoid shrubland, and extensive hummock (*Triodia*) grasslands. Atypically for the Desert, this south-western portion also harbours extensive paleodrainage features which confer land surfaces such as kopi dunes, gypsiferous playas and hypersaline lake beds that are not well represented elsewhere in the region, perhaps with the exception of the Lake Disappointment environs. Low *Melaleuca* heaths with hummock grasslands and samphire (*Halosarcia*) flats dominate these biologically interesting land surfaces. Similarly, the occurrence of heavy clay-loam soils in the south-western portion of the Desert enables the persistence of regionally significant mulga woodlands, a vegetation type mostly absent from the region.

Phytogeographically, this south-western portion of the Desert is part of the transitional zone between the *Acacia* dominated communities of arid southern Australia and the hummock grasslands of arid tropical northern Australia (*Acacia-Triodia* line, Beard 1975). Concurrently, and conceivably not independently, this portion of the Desert is always a physiogeographic transition zone between the sandy pediments of the central Australian deserts and the rocky pediments of the arid Pilbara and Gascoyne Biogeographical Regions.

The heterogeneity of land surfaces in the south-western Little Sandy Desert and its juxtaposition in respect to major deterministic influences controlling the distribution of Australian biota confers significant potential for prowess and richness in the diversity of biota in this portion of the Desert. Results from this biological survey substantiate this proposition.

The south-western Little Sandy Desert has an identified flora comprising some 522 taxa, many of which are ubiquitous species throughout the Western Australian arid zone, although a number are characterised by restricted distributions and at least two are very narrow endemics. A large proportion of the flora represents disjunctly distributed or range-end taxa, a result which was not unforeseen given the transitional predicament of the study area, a rudimentary appreciation of the flora of Little Sandy Desert prior to the survey and the coalescence of floral elements from central, southern and tropical desert regions. Deficiencies in our comprehension of the flora of the region is illustrated by the large number of first time records obtained during the survey for the biogeographical region and the collection of several novel taxa which have not been previously reported in the scientific literature. There appears to be substantial overlap in the flora of the study area with that recorded from other parts of the Little Sandy Desert, particularly for the ubiquitous sand dune and sand plain habitats. However, persistent mulga woodland communities and the floristic assemblages associated with the unique paleodrainage land surfaces in the study area have bestowed the south-western Little Sandy Desert with a distinctive flora. This flora partitions into readily distinguishable floristic communities under control exerted by land surface and edaphic influences.

The herpetofauna of the Little Sandy Desert is well represented within the study area by 87 species. Many of these species are ubiquitous, occurring throughout the arid zone, although a few, including several that are not yet described, are endemics. As with the flora many records obtained during the survey are symptomatic of range-end distributions in that species recorded in the study area do not appear to pass beyond the western and southern fringes of the Desert. A similar range-end distributional pattern was detected amongst some of the 116 birds recorded in the study area. Most of these birds are typical of arid zone habitats although the 20 species of waterbird recorded on Savory Creek is somewhat atypical. As with the plants, the birds form species assemblages that are controlled by land surface considerations. The mammal fauna of the south-western Little Sandy Desert epitomises the extant mammal fauna of the biogeographical region with only one species known from the latter not being recorded in the study area. Most mammals tend to be ubiquitous although a few were at their extant range-ends. As with the rest of the Little Sandy Desert and arid inland parts of Australia (Burbidge and McKenzie 1989), the study area has experienced a significant loss of mammal species and an influx of exotics.

RESERVATION STATUS

The reservation status of the Little Sandy Desert for conservation purposes is considered to be inadequate and unrepresentative of the biogeographical region (Thackway and Cresswell

1995). Only one conservation reserve impinging on the Desert (40% of the Rudall River National Park) and this reserve captures only 4.6% of the region. Being situated across the northern margin of the region and capturing mostly the rocky ranges of the Rudall River area this reserve is biased in it representation of the biogeographical region. This bias is clearly illustrated by the fact that 37% of the LSD1 sub-region, the sub-region which conforms to the rocky ranges of the northern Little Sandy Desert, is represented within this national park while only 1.3% of the LSD2 sub-region is captured. Basically, the sand dunes and sand plains which epitomise the Little Sandy Desert are unrepresentative in the national park occupying only 18% of the conservation reserve which falls within the biogeographical region. The inadequacy and unrepresentative of land reservation for conservation purposes in the Little Sandy Desert is further demonstrated by the realisation that less that 1.6% of the *ca.* 86 688 km^2 of eolian sand dune and sand plain country in the region is reserved.

Other conservation reserves have been proposed for the Little Sandy Desert however they have not come to fruition. The first was proposed in 1962 by the Western Australian Sub-Committee of the Australian Academy of Science Committee on National Parks (Anon. 1965). This first reserve proposal encompassed the whole of Lake Disappointment, its fringing apron and extended westward along Savory Creek to the abandoned No. 1 Vermin Proof Fence (Burbidge and McKenzie 1979). This first reserve never received official approval and consequently has not been acted upon. In 1974 the Conservation Through Reserves Committee proposed the creation of the Lake Disappointment and Carnarvon Range Class 'A' conservation reserves (Conservation Through Reserves Committee 1974). These proposals were submitted to government by the Environmental Protection Authority in 1975 as they 'considered it undesirable not to have such a habitat represented in a scheme of reserves' (Environmental Protection Authority 1975). State Cabinet subsequently endorsed these proposals in February 1996 (McKenzie *et al.* 1983). Today these proposals are unfulfilled but still remain desirable acquisitions to the conservation estate of Western Australia (Conservation and Land Management 1994). The proposed 6 120 km^2 Lake Disappointment Nature Reserve has many unresolved issues related to Native Title and aboriginal land access and is also considered highly prospective for gold and uranium while the proposed 3 907 km^2 Carnarvon Range Conservation Park is also entangled in Native Title issues and is considered highly prospective for diamonds and base metals (Environmental Protection Authority 1993, Conservation and Land Management 1994).

Contemporary conservation and management planning by the Western Australian Water and Rivers Commission in conjunction with Environment Australia has identified the Lake Disappointment catchment, which encompasses Savory Creek and the Rudall River catchment, as potential Wild River candidates. The general principles and Code of Management for Wild Rivers (Environment Australia 1998) is unlikely to confer any additions to the conservation estate in the Little Sandy Desert (Susan Worley, Water and Rivers Commission, pers. comm).

RESERVATION RECOMMENDATION

The principal aim of this survey was to comprehensively document the flora and fauna of the south-western Little Sandy Desert. This has been achieved. Apart from the resources and biological inventories generated by this survey, one of the main outputs planned since conception of the survey was the submission of recommendations for conservation reservation to redress inadequacies and bias in the existing system of the biogeographical region. To this end the following recommendation is submitted and justifications provided.

The Recommendation

A nature reserve should be gazetted which encompasses the majority of the south-western Little Sandy Desert as described in this survey. The boundary of the proposed nature reserve is depicted in Figure 7.1. The boundaries of the proposed nature reserve should be at latitude 23° 57' 33" S in the north, longitude 120° 50' E in the east, latitude 24° 43' 55" S in the south and to the west the reserve should abut the Weelarrana, Kumarina and Marymia pastoral leases. The reserve encompasses an area of 6 250 km^2 or about 5.6% of the biogeographical region.

The nature reserve should be a declared Class "A" for the Conservation of Flora and Fauna and vested with the Conservation Commission of Western Australia. It is suggested that the nature reserve be called the 'Giles Nature Reserve' in honour of Earnest Giles, the first European to collect biological specimens in the region and whom ultimately was the impetus for this biological survey.

Justifications

The justifications submitted to substantiate this nature reserve proposal are:

- The documentation of considerable biological diversity in the study area as demonstrated by 522 plant, 5 amphibian, 82 reptile, 166 bird and 28 native mammal species;
- An appreciation that the biota of the proposed nature reserve is representative of the biogeographical region (e.g. all but one of the mammals and 18 of the reptiles known from the Desert were recorded in the study area);
- An appreciation that the biota of the proposed nature reserve includes plants and animals that are apparently new to science (*Halosarcia* sp. Yanneri lake (SVL 3002), *Planigale* sp. 2), poorly known (e.g. *Lerista xanthura*, *Antechinomys laniger*), endemic (*E. rameliana*, *Strophurus wellingtonae*) or of conservation significance (*Sminthopsis longicaudata*, *Stemodia linophylla*);
- The realisation that the proposed nature reserve encompasses possibly two biogeographical transition zone as evident by the persistence of many range-end or disjunctly distributed plants and animals;
- The heterogeneity in land surfaces and soil types which control the distribution of plant communities and inherently defines faunal distributions;
- The significant representation of eolian sand dune and sand plain habitats which epitomise the biogeographical region; and
- The representation of paleodrainage land surface features (e.g. gypsiferous playas, hypersaline lake beds, lunette dunes) and mulga woodlands which are both not well represented in the desert or in the existing conservation reserve network within the biogeographical region.

The above biological information collected during the biological survey overwhelmingly substantiates the proposition that the proposed nature reserve will redress issue of comprehensiveness, adequacy and representativeness with respect to the conservation reserve network within the biogeographical region. The

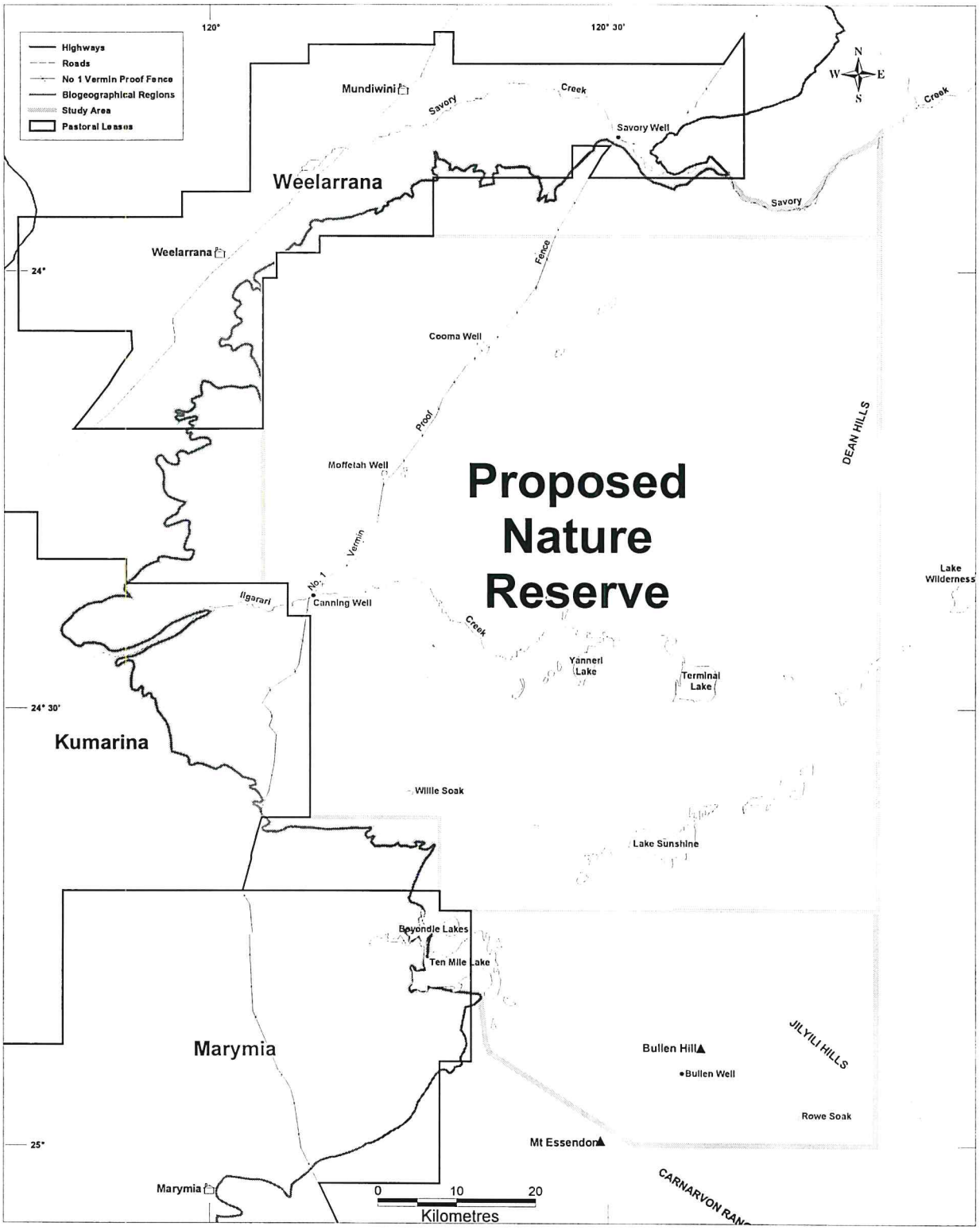

Figure 7.1 Location of the proposed Giles Nature Reserve in the south-western Little Sandy Desert.

implementation of this nature reserve proposal will be an increase in conservation reservation within the region to 10.3% overall and for the LSD1 sub-region this increase will be from the current level of 1.4% to 7.6%.

This northern portion of the south-western Little Sandy Desert study area was excluded from this nature reserve proposal in order to negate problematical management issues related to the control of livestock and feral animals, as grazing by such animals is not an acceptable activity on a nature reserve. While it is acknowledged that this area has biological value (e.g. 20 species of waterbird recorded from Savory Creek and only locality for *Pseudomys chapmani* and *Chelodina steindachneri*) the difficulty and financial impost of managing grazing pressures, livestock and feral animals in this remote region was considered an unnecessary burden for the management agency.

The southern portion of the south-western Little Sandy Desert study area was not included in the boundary of the nature reserve proposal as biological data on this area was not available to substantiate its inclusion. The southern boundary of the proposed nature reserve is approximately 15 km north of the northern boundary of the proposed 'C' Class Carnarvon Range Conservation Park.

Considerations for Reservation

The entire area encompassed within the proposed nature reserve is Unallocated Crown Land with the exception of the abandoned No. 1 Vermin Proof Fence (↑ 12297). Some negotiation with adjacent pastoral leaseholders may be necessary to ascertain to the most appropriate and rational alignment of abutting boundaries. For example, the owners of Weelarrana Station (John and Debbie Anick) have indicated that they wish to straighten their pastoral lease boundary in the area adjacent to the north-western corner of the proposed nature reserve (van Leeuwen, pers. comm.).

Mineral interests in the area are minimal with only one small exploration lease (E69/1817) active over part of the proposed nature reserve (Department of Minerals and Petroleum Resources 2002). This lease is held by Western Australian based Sipa Resources. The area is considered to be of low to possibly moderate prospectivity for economically viable mineral deposits, in particular gold (Williams 1995). The area is also encompassed in an petroleum exploration permit (EP418).

Control of fire and feral animals is an issue for future management within the proposed nature reserve. Strategies employed and refined by the Department of Conservation and Land Management in the administration of several other desert nature reserves should be appropriate and transferable to this proposal.

The commercial harvesting of camels under licence from the Department of Land Administration is an issue for the management of this proposed nature reserve. Currently the proposed nature reserve is encompassed within the bounds of an Occupation Licence for the purpose of harvesting camels held by Nic and Heather Foote. This licence is renewed annually with advice from the Department of Conservation and Land Management. Current licence conditions preclude the establishment and development of infrastructure and facilities in the area covered by

the Occupation Licence and grants the holders no formal tenure, occupation rights or a registrable interest in the land. These conditions should be maintained on the Occupation Licence for the term of its currency.

Nature-based and four-wheel drive tourism along the abandoned No. 1 Vermin Proof Fence may be an issue for future management. This should be administered through a management plan or guidelines similar to those established for the Canning Stock Route and other remote parts of the State where tourism and camping occurs on nature reserves.

Impediments to the implementation of this nature reserve proposal will primarily relate to the negotiation of satisfactory land access agreements with the three Native Title aspirant (WC96-078, WC98-068, CW99-004) with claims over areas encompassed by the nature reserve proposal. Undoubtedly negotiation will also be required with the mineral resources industry and the Western Australian Department of Mineral and Petroleum Resources.

An opportunity exists to augment the comprehensiveness, adequacy and representativeness of the conservation reserve system in the Little Sandy Desert. The proposed Giles Nature Reserve supports substantial biodiversity and is offered as the instrument to achieve this outcome, an outcome that will be a gain for conservation.

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