

1996 The Discovery Project

The Great Sandy Desert has proven difficult to explore for the early explorers as well as those that followed, naturalists, prospectors and adventurers. The oil exploration companies blazed tracks and seismic lines through the desert that provided some access for those that followed.

In 1994, some participants of a nine day trek supported by Australian Geographic ventured south from Edgar Range to McLarty Hills, Kurriji-pa-Yajula and Pikarunga. Discussions followed this expedition regarding the possibility of a more detailed survey of up to 3 weeks involving biologists and botanists, with Aborigines sharing knowledge of their homelands.

1996 was to be the centenary of the Calvert expedition, which made the first European traverse of the Great Sandy Desert from south to north. Tragically, two young members of Lawrence Wells' party died near spot which Wells called Discovery Well, after failing to find Colonel Warburton's Joanna Spring (Pikarunga). As the proposed survey would be operating around this area, it was decided to call it the **Discovery Project**.



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A base camp format was used for the Project, with the main features being:

- valuable observations were recorded from Aborigines who knew the country well
- general information on flora and fauna was collected in a region rarely visited by scientists because of difficulty of access
- surface and ground water samples were taken for later analysis
- an archaeological survey was carried out around a significant Aboriginal campsite
- baseline information was collected on Kurriji-pa-Yajula, with concern for the damage being done to vegetation by feral camels
- a special opportunity was provided for secondary and tertiary students to experience the desert and interact with Aborigines and scientists
- early European history of the area was investigated.

A small expedition in August 1995 checked access tracks and water bores. It was decided that the base camp would be at the abandoned Pegasus oil exploration site, used by Amoco Australia Pty, 305km east of Anna Plains Station. A 1.5 km airstrip had been constructed just north of the site and, though required clearing, it was used during the project.

Aware that the land about the Project area was still significant to the Aboriginal people, every effort was made to keep the people and organisations which represent them fully informed of what was planned.

Project outcomes

Rain gauge

An initial automatic rain gauge installed at the Pegasus airstrip on the 1995 exploratory expedition was damaged within a month, presumably by a Sandy Inland Mouse. Subsequent rain gauges (duplicate in case of a malfunction) installed during the Project period successfully collected daily

rainfall data. This was collected on August 17, 1997, by a smaller returning party of Project participants. The data showed that for the July 96 - July 97 period, the Project area experienced exceptionally high rainfall of 740 mm. The extraordinarily high rainfall experienced in 1996/97 throughout the Kimberley and Pilbara regions has been shown to have penetrated well inland to the Project site.

Water quality

Water samples were taken from four bores and four surface water sources during the course of the Project. Chemical analysis of water quality was carried out by the Water and Rivers Commission in Perth. The water quality of the four bores was quite suitable as a drinking water source, albeit with total dissolved salt (tds) levels elevated by the soil chemistry of the aquifers that contain the water source. The surface water sources had much elevated levels of tds and chloride making them much less suitable as a drinking water source. However, it is noted that these levels will be elevated due to evaporation lowering the water levels and concentrating the chemistry in the water. The water quality will be improved after the monsoonal rains of December - February each year.

Microcosm beneath Triodia tussocks

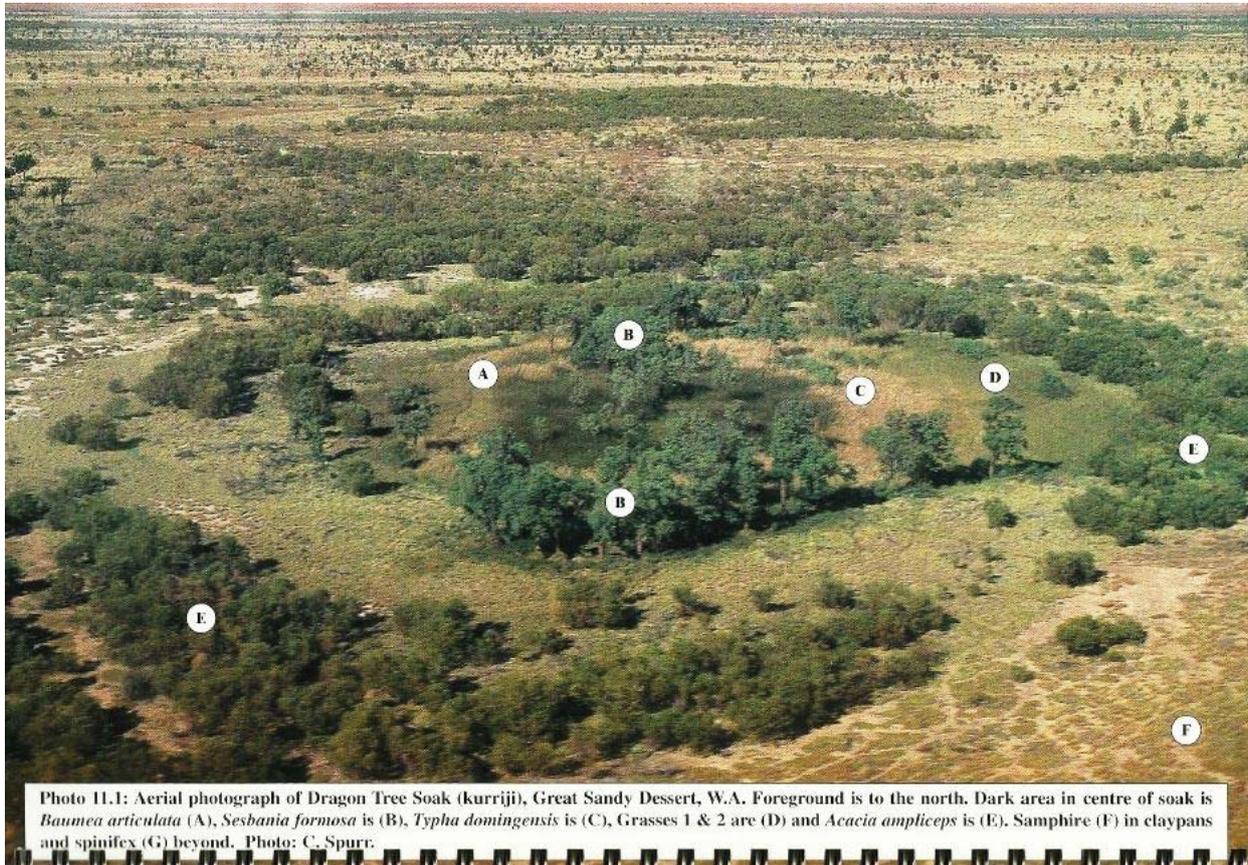
During the Discovery Project, the opportunity was taken to examine the microcosm beneath tussocks of *Triodia basedowii*, the most common tussock grass of the Great Sandy Desert. The tussocks grow both on the sand dunes and in the swales between the dunes. The investigation involved removing the upper shoots with as little disturbance as possible and the base of the clump examined for signs of animals and for animals themselves. The results indicate that large tussocks contain more tunnels and other signs of use by animals than small tussocks. By implication, small vertebrates require many large and presumably older tussocks. It follows that frequent burning of the *Triodia* sandplain is likely to prevent the growth of large tussocks and therefore deprive small vertebrates of tussocks of optimal size for shelter.

Land Management Plan for an Arid Zone Wetland Kurriji-pa-Yajula, Dragon Tree Soak, Great Sandy Desert, Western Australia

This water body is of interest in that it supports relict populations of plant species that are not found anywhere else in the region. The soils found in the vicinity of the soak which are able to support this vegetation must also be unique.

Surface water during the Project was minimal with two separate areas each of only a few square meters being open, although this would be subject to seasonal and episodic variation. Most of the waterhole is dominated by vegetation, with rushes (*Baumea* and *Typha*) by the water, dragon tree (*Sesbania*) scattered throughout but becoming less frequent further out. Two grass species (*Paspalum* and *Sporobolus*) grow out from this area and combine with a surrounding ring of *Acacia*. Beyond this, the vegetation quickly assumes that of the desert landscape, dominated by spinifex (*Triodia* and *Plectrachne*).

The region is under pressure from feral animals such as camels and cats. Increased visits by tourists to the region are also affecting the delicate landscape. The creation of tracks and other disturbances by visitors going where they please is detrimental with increasing numbers.



This is but one arid zone wetland. Due to their location in often remote environments, management, if any, is often not very structured. With increased mobility by people and the spread of feral animals, these wetlands which are often a focus for desert life, are in threat. Establishment and support of management plans is a priority to protect these areas.

Morphology of Baumea articulata between geographically and climatically distinct populations

Baumea articulata is a common wetland sedge species of the south-west of Western Australia, occurring in all mainland states except for the Northern Territory. The WA population extends to just north of Perth. An isolated population occurs at Kurriji-pa-Yajula, in Dragon tree Soak. A study of the morphological descriptors was undertaken to determine if there had been variation in plant physiology due to its isolation from other populations. Environmental parameters were measured to assist in explaining variations that may occur. However, apart from temperature regimes at Kurriji-pa-Yajula being radically different from other populations, all other environmental parameters were in the ranges experienced in populations around Australia.

It was concluded that the population of *B articulata* at Kurriji-pa-Yajula was not distinctive morphologically from its southern population counterparts.

Report on the vegetation of Dragon Tree Soak

The soak lies in country typical of the Great Sandy Desert, predominantly flat with occasional sand dunes and communities of spinifex, *Acacia* and Desert Walnut *Owenia reticulata*. However, some of the vegetation of this remote and unique oasis is thought to be under threat from excessive grazing by camels. Additionally, the dominance of some of the grass species here appears to be excessive, having the potential to outcompete many of the other plant species and further enhance their dominance. Assessments of tree health and camel grazing were undertaken.

Results from the transects show a clear uniformity amongst them, with an overall pattern being found right around the soak. generally this consisted of initially one or more sedge species for the

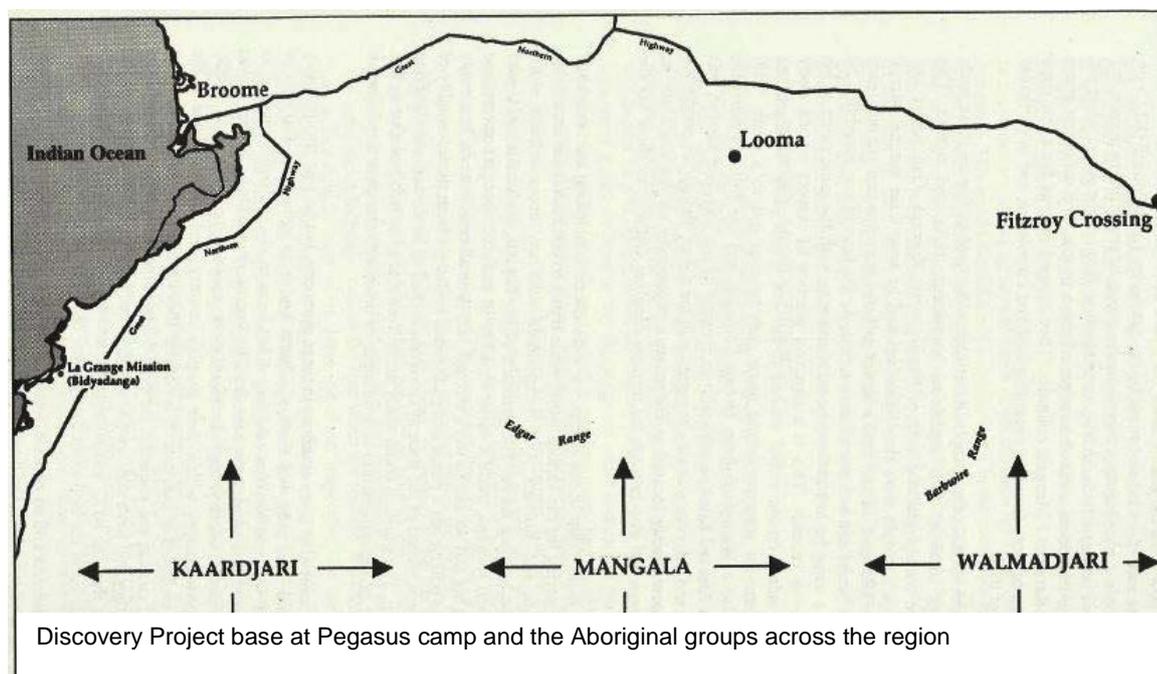
first few meters, followed by a transition to the totally dominant *Paspalum vaginatum*, which in turn, gives way completely to *Sporobolus virginicus*. There is a strong correlation between zones of *S. virginicus* and *Acacia ampliceps*. The belt of *A. ampliceps* is about 30 m wide and generally has a closed canopy. *S. virginicus* sometimes extends beyond the acacias before changing rapidly to tuftgrass, samphire and *Plechtrachne spp.* Transition lines between species, for example *P. vaginatum* and *S. virginicus*, are often short and sharp.

The transects documented will facilitate the observation of any major changes in the belt of vegetation around the soak. It is difficult to assess accurately the regimes of any past browsing of *S. formosa*, with examples such as thinning of the understory being anything between a sporadic event or an ongoing problem.

Indigenous knowledge from the Great Sandy Desert of Western Australia.

Time was spent working with Aboriginal people who knew this country, recording their knowledge on survival skills and use of natural resources. Original desert lifestyles established for thousands of years are currently undergoing rapid transformations. Some of the peoples originally from these areas are the Kaaradjari, Mangala and Walmadjari.

An intimate knowledge of their environment and the use of finely tuned skills allowed these people to survive in their harsh desert surrounds, having only what the country provided. Now they live mostly at the communities of Bidyadanga and Looma and other communities in and around Fitzroy Crossing.



Fauna studies

The aim of fauna studies carried out during the Discovery Project was to collect information on fauna in a region rarely visited by scientists. The project also provided the added opportunity to gather information from Aboriginal informants who had lived a traditional lifestyle in the region as recently as the early 1970's.

In addition to keeping opportunistic records and holding discussions with aborigines, some systematic sampling was carried out. At Pegasus Camp, two lines of pitfall traps were established,

both from swale to dune top, one in an unburnt area and the other in an area that had been burnt approximately 6 months earlier.

The information gleaned by the Project team serves as a record of observations whose main value lies in future reference, but some topical comments can be made. The most important observations lie with birds and mammals, many of which can be readily observed, whereas reptiles are often only encountered by trapping and observations are, therefore, very dependent on how and where trapping is carried out.

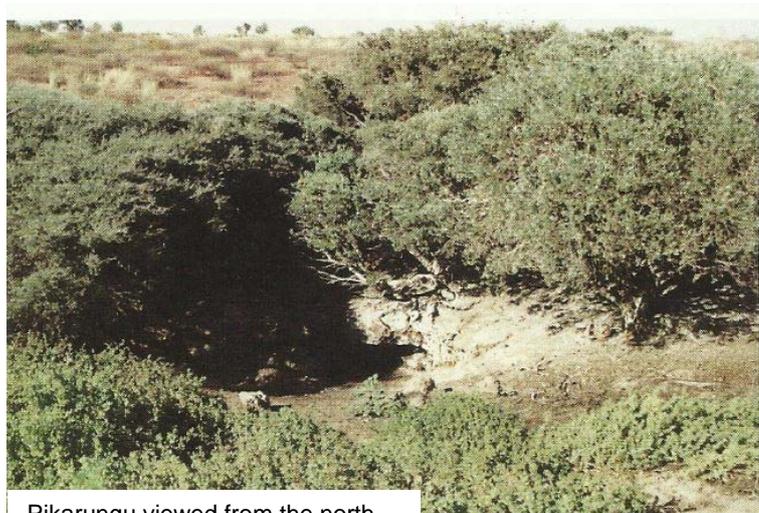
Observations on mammals are consistent with the opinion that small mammals persisted until recent times, survived the invasion of their country by Foxes and Cats, but died out when the Aborigines ceased their fire management. There seems little doubt that the alteration in the fire regime from small frequent fires creating a patchwork of fire-ages across the landscape, to infrequent but very extensive fires, lies behind some massive changes in the desert fauna.

The total number of species known from the region as a result of this trip and combined with trips in 1981 and 1994 is an impressive tally for an arid area: 2 frog, 37 reptile, 51 bird and 20 mammal species. Much of this richness, however, is due to Kurriji-pa-Yajula. Of the 51 bird species recorded during the Discovery Project, 12 were recorded only at Kurriji-pa-Yajula. Nearly a quarter of all of the bird species recorded in a study that encompassed an area several hundred kilometres across, were dependent upon one site with an area of a few hectares. This site clearly requires management to ensure that camels can be excluded and that increased tourism does not lead to environmental damage of such a fragile, important site.

Pikarungu and Kiriiny: a survey

Pikarungu and Kiriiny are springs approximately 800 m apart, set in the sand hills of the Great Sandy Desert. The springs are associated with a series of claypans lying between the sand hills. These claypans are partially covered with samphire and couch grass and are surrounded by clumps of melaleuca.

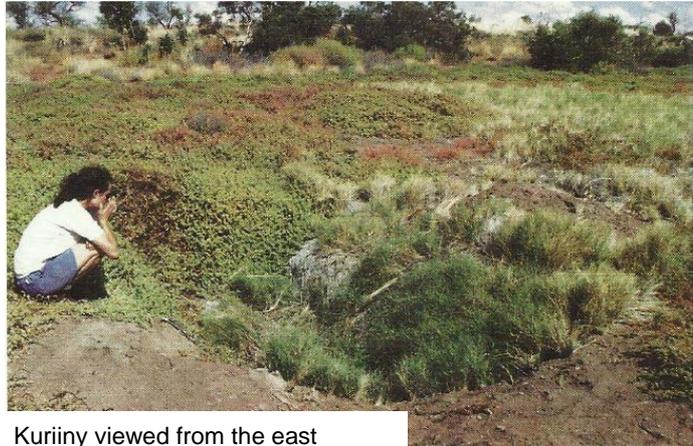
The springs lie within Mangala country but are close to Juwaliny country. Traditionally, these two springs were of considerable significance to the Aborigines, both to the traditional owners and to those further afield, the Yulparija to the south and the Walmadjari to the east. The springs were both permanent water, reliable sources of water at the end of the dry season.



Pikarungu viewed from the north

Relatively recently, there have been a number of visitors to Pikarungu and Kuriiny due to a combination of factors. The network of seismic lines left behind after oil exploration and the popularity of the modern four-wheel-drive vehicle has given visitors relatively safe access to remote areas. The Kimberly Land Council has lodged a land claim over part of the Great Sandy Desert on behalf of traditional owners. As part of this process, it has been necessary for the traditional owners to visit the lands under claim as well.

The fragile salt-encrusted claypan environment is readily damaged. The popularity of the area has resulted in a network of vehicle tracks across the landscape.



Kuriiny viewed from the east

Aboriginal land claims provide an opportunity to explore management of these (and other) sites, aimed at preventing further damage and hopefully allowing regeneration of the vegetation of the sites.

Under the present situation, it should be possible to designate parking and camping areas and to use signage to encourage visitors to participate in protecting the site. If under CALM management, the track may be closed to vehicles, with signage and educational material to encourage compliance. Once the country comes under Aboriginal control, access to the site may be denied completely or access may be much more restricted.

This will allow natural forces to work on the landscape, gradually returning it to as close as possible to its former state.

School student's contribution

The Discovery Project accommodated two school groups, four students and a teacher from All Saints College, Bathurst, NSW that participated in the first half of the Project and three students and a teacher (and partner) from Hale School, Wembley, WA that participated in the second half of the Project.

The experiences shared by the students and their teachers with the participants of the Discovery Project will remain with them for many years. Exposure to the expanse of the desert, the coordination and interactions involved with such an expedition and the enthusiasm of the scientific aspects of the Project all contributed to make their involvement so memorable.

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