BIOLOGICAL SURVEY OF

BARLEE RANGE NATURE RESERVE

Project (N92/5)

Progress Report 11

Prepared by: *Stephen van Leeuwen*

Date: *August 1996*

TITLE OF PROJECT:

Biological survey of the Barlee Range Nature Reserve (A ↑26808)

AGENCY:

Western Australian Department of Conservation and Land Management (CALM) (undertaken jointly by the Science and Information Division and the Pilbara Regional office).

PROJECT SUPERVISOR:

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PROJECT OFFICERS:

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SCOPE OF PROPOSAL:

a. Select sites that represent the array of communities typical of the Barlee Range.

b. At all sites, establish and sample permanent quadrats recording landform unit, species composition, habitat type and the vegetation associations present. Permanent quadrats will enable, through long-term monitoring, the documentation of change over time and after environmental perturbations.

c. Analyse data sets for each biotic group sampled (flora, mammals, birds, reptiles, amphibians and invertebrates (ants)), discussing patterns of community structure, species richness and distribution. Prepare descriptions of vegetation associations and landform units present and map their distribution within the reserve.

d. Publish results of the survey and subsequent analyses. Discuss implications of these results with reference to the representativeness of the nature reserve and it's nature conservation values. Make recommendations for management where appropriate.

WORK COMPLETED

Since the submission of the last report in May 1996 progress towards completion of this project has continued, albeit at a slow rate. Progress has stalled somewhat as no further advances with flora and fauna identification and databasing can be made until external specialist taxonomists have confirmed specimen identifications and verified the current taxonomic status tentatively assigned to many of the specimens collected.

This issues of specimen identification is particularly pertinent to the flora where many specimens collected during previous trips represent poorly known taxa from genera and families with unresolved taxonomic problems.

As detailed in the previous progress report all field work associated with this project has been completed.

In the past few months the GIS database for this project has been maintained and continually developed through the addition of new themes and the verification and correction of existing themes. The development of the GIS database is a dynamic process which will continue until the production of the final report.

Progress on this project, with reference to all biotic groups is outlined in the following sections.

Plants:

Work has progressed on the identification of the 320 plus taxa recorded within the Nature Reserve. Approximately half of the specimens collected represent new taxa not previously recorded within the reserve. As previously mentioned many of these taxa represent poorly known species which require identification by specialist taxonomists, a procedure which is currently underway.

Recently, confirmation of specimen identifications have been received for some of the Poaceae genera, acacias and most Malvaceae. These identifications included may taxon which have not previously been described. Some specimens also represent significant range extensions for previously known species.

Mammals:

All mammal records collected from within the Nature Reserve during the course of this project have been databased. This database is now complete and incorporates records and vouchers held at the Western Australian Museum. Taxonomic problems still exist with some taxa, especially for specimens of *Psuedoyms*, however, these problems should shortly be resolved through more detailed morphological and biochemical investigations.

Reptiles and Amphibians:

All herpetofauna records obtained during this project have been databased. Some taxonomic problems still exist in several reptile groups, particularly the *Lerista* complex, however, recently revised taxonomic keys should help resolve these problems.

Identification and clarification of the taxonomic status of various frog species is continuing. At present it appears that six species of frog occur within the reserve, one of which may be a novel taxon in the genus *Neobatrachus.* Further taxonomic research, including electrophoretic and DNA analysis of biopsy material, should clarify the status of all amphibian specimens collected.

Birds:

All 105 species of bird recorded within the Nature Reserve have been databased. Searches are currently underway to check Western Australia

Museum records to ensure that all birds previously recorded within the Reserve are included on this list.

Invertebrates:

Sorting and identification of non-Formicidae (non-ants) invertebrate samples is progressing at the Western Australian Museum's Department of Terrestrial Invertebrates. Sorting, counting and databasing of ant specimens has been completed. Confirmation of specimen identification and taxonomic status for the ant specimens is currently underway at Curtin University.

In the next three months it is planned to complete all databases and continue the development and refinement of the GIS database. Initiation of the final 'draft' report will also commence in the next three months. Reminders will be forwarded to specialist taxonomists requesting confirmation of identifications for specimens previously forwarded.

Information generated from this project has already be incorporated into management and operational programs. Recently, with funding from the Feral Pest Program (ANCA), the Yadjiyugga Claypan was fences to exclude feral animals and stock from this vulnerable community. Similarly, with information gathered during this project this claypan and the wetlands within Kookhabinna Gorge have been included on the Directory of Important Wetlands in Australia (ANCA 1996)[1] (see Attachment 1).

EXPENDITURE TO DATE

No expenditure statement is included with this progress report as no funds have been debited against this project since the September 1995 progress report.

As detailed in Progress Report 9, at September 1995 a total of $16 924 or 84% of the $20 000 NEGP budget had been consumed. Therefore to date, 71% of NEGP fund expenditure has been directed towards the purchase of materials and equipment required to undertake the survey. The remainder has been spent on vehicle hire fees and running changes.

A cost overrun in the budget for this project is not anticipated.

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[1] Australian Nature Conservation Agency (1996). *A Directory of Important Wetlands in Australia*. 2nd edition, ANCA, Canberra.

ATTACHMENT 1a

Extra from "A Directory of Important Wetlands in Australia (ANCA 1996)"

31. Kookhabinna Gorge - GAS001WA

Location : Upstream limit: 23° 15' S, 116° 01' E, downstream limit: 23° 04' S, 116° 02' E; 200 km west south-west of Tom Price. Bioregion: Gascoyne. *Shire*: Ashburton.
Area : Up to 100 m in width with most of the channel less than 50 m and about 25 km long.
Elevation : 210 m ASL.
Other listed wetlands in same aggregation : None.
Wetland type(s) : B2, B14.
Criteria for inclusion : 1, 3.
Site description : A series of 13 or more permanent to semi-permanent pools along the narrow steep-sided gorges of the intermittent Kookhabinna Creek widening into a sandy channel reach with a narrow active floodplain below Goordeman Pool.
Physical features: Landform: A microscale irregular creek with deep semi-permanent pools. Geology: Set in the Capricorn orogen, Kookhabinna Creek drains a small catchment in a massive north-west trending sandstone range. The upper creek flows through a deeply incised gorge where a series of rockbars trap small amounts of alluvial sediment and water in deep pools. Downstream of Goordeman Pool the creek leaves the confined gorge becoming a sinuous alluvial channel on a sandy plain. Climate: Median and mean annual rainfall at nearby Ullawarra are 221 mm and 240 mm respectively, mostly falling in Jan-March; average annual evaporation is c. 3400 mm.
Hydrological features: Water supply: Kookhabinna Creek is fed by numerous small tributaries, most less than 5 km in length. Water depth: Deepest pools up to 10 m. Water salinity: Fresh. Water colour: None.
Ecological features: Ecological role: A drought refuge for fauna. Plant structural formations: Low open-forest with open shrubland and sedge understorey.
Significance : An outstanding example of a well-watered gorge environment unusual in the bioregion.
Notable flora: Threatened species: None. Composition: River Red Gum *Eucalyptus camaldulensis*, Coolibah *E. victrix* and cadjeput *Melaleuca argentea* forest with dragon trees *Sesbania formosa* and *Acacia citrinoviridis* open shrubland. The bulrush *Typha domingensis* and common sedge *Cyperus vaginatus* line the banks of the creek and form dense swamps. An undescribed species of *Cassytha* occurs and an new species of nancy lily (*Wurmbia* sp.) found only in the gorges of the Barlee Range, but related to species found elsewhere in the Pilbara. The surrounding hills are dominated by *Triodia* spp. and small *Acacia* shrubs (S. van Leeuwen pers. comm.).
Notable fauna (waterbirds): Threatened species: None. Composition: 12 species of waterbird occur, including five herons and allies and three ducks. The area is a refuge for Clamorous Reed Warbler *Acrocephalus stentoreus* (P. Fuller pers. comm.; S. van Leeuwen pers. comm.).
Notable fauna (other taxa): Threatened species: Presence of the Orange Horseshoe-bat *Rhinonicteris aurantius* (St) was confirmed in 1995. Composition: 46 species of birds have been recorded in the gorges, including one of six records of Dollarbird *Eurystomus orientalis* (1 Sept 1995) in the north-west region. Olive Pythons *Liasis olivaceus*, five species of frog, six species of freshwater fish and 11 species of bat have been recorded around the pools, including a population of Little Red Flying Fox *Pteropus scapulatus*. An isolated population of the skink *Lerista flammicauda* occurs. Breeding: A pair of Peregrine Falcons *Falco peregrinus* breed in the gorge (Storr 1984; P. Kendrick pers. comm.; S. van Leeuwen pers. comm.).
Social and cultural values: Research: Type locality for the frog *Pseudophryne douglasi*. Ongoing biological surveys and river monitoring (Goordeman Pool) by WADCALM. Tourism: Poor access, lack of facilities and sensitivity to disturbance make the area unsuitable for tourism. Aesthetic: The lush forested swamps and tree-lined pools in spectacular gorges contrast with the aridity of rugged folded sandstone ranges and broad featureless valleys.
Land tenure :
On site: Entirely within the Barlee Range Nature Reserve (26808, Class A) for Conservation of Flora and Fauna.
Surrounding area: Leasehold (Glenflorrie, Maroonah, Ullawarra pastoral leases).
Current land use :
On site: Nature conservation.
Surrounding area: Pastoral grazing (cattle and sheep).
Disturbances or threats :
Current: Damage by cattle and feral donkeys.
Potential: Tourism has the potential to cause considerable damage to the environment.
Conservation measures taken : Limited public access.
Management authority and jurisdiction : Managed by WADCALM for NPNCA.
Compiler & date : Romeny J. Lynch, c/- Department of Conservation and Land Management, Busselton. July-October 1995.

ATTACHMENT 1b

Extra from "A Directory of Important Wetlands in Australia (ANCA 1996)"

34. Yadjiyugga Claypan - GAS004WA

Location : 23° 04' S, 115° 48' E. *Bioregion*: Gascoyne. *Shire*: Ashburton.
Area : c. 400 ha.
Elevation : c. 200 m ASL.
Other listed wetlands in same aggregation : None.
Wetland type(s) : B6.
Criteria for inclusion : 1, 3, 6.
Site description : A closed drainage with hills to the west and gentle rises all around except the east where the lake occasionally overflows into Wongida Creek.
Physical features: Landform: A macroscale circular sumpland. Geology: Set in the Bangemall Basin, the claypan, possibly a relict oxbow lake, is surrounded by stony gibber plains rising to undulating uplands and low hills of sandstone and calcrete with accumulations of aeolian sands on their slopes. The lake bed consists of surface cracking reddish-brown loamy clay to more than 1 m deep. Climate: Median and mean annual rainfall at nearby Uaroo are 279 mm and 296 mm respectively, mostly falling in January-March; average annual evaporation is c. 3400 mm (Payne *et al.* 1988; S. van Leeuwen pers. comm.).
Hydrological features: Water supply: Localised surface inflow and direct precipitation. Inundation: More information needed, probably seasonal. Water depth: When flooded shallower flats may be 1.5 m deep and channels up to 2.5 m deep. Water salinity: Fresh. Water colour: Usually brown due to disturbance by cattle, but settles to clear (S. van Leeuwen pers. comm.).
Ecological features: Ecological role: A semi-permanent water source for fauna, including waterbirds. Plant structural formations: Open woodland to closed forest with scattered Acacia shrubs and open tall grass over dense herbland understorey.
Significance : The wooded freshwater claypan lake is possibly unique to the bioregion (which is dominated by large freshwater river systems and closed saline palaeodrainage features).
Notable flora: Threatened species: None. Composition: The claypan is dominated by Coolibah *Eucalyptus victrix* woodland which grades into closed forest on the western side. This overlies Acacia tall open-shrublands, tall open grassland of the perennial *Eriachne benthamii* and dense herbland of the samphire *Tecticornia verrucosa* which occurs nowhere else in the north-west region. The latter is a disjunct population of a species not found elsewhere in the Pilbara. A recent botanical survey found plants of a new species similar to those of the genus *Peplidium*. The surrounding stony plain is vegetated by Snakewood *Acacia xiphophylla* open shrubland (Payne *et al.* 1988; P. Kendrick pers. comm.; S. van Leeuwen pers. comm.).
Notable fauna (waterbirds): Threatened species: None. Composition: Six species of waterbirds have been recorded during two surveys: Pacific Heron *Ardea pacifica*, Grey Teal *Anas gibberifrons*, Pink-eared Duck *Malacorhynchus membranaceus*, Black-fronted Plover *Charadrius melanops*, Banded Stilt *Cladorhynchus leucocephalus* and Whiskered Tern *Chlidonias hybrida* (P. Fuller pers. comm.; S. van Leeuwen pers. comm).
Notable fauna (other taxa): Threatened species: None. Composition: 37 species of bird have been recorded at the claypan including species dependent on free water such as Diamond Dove *Geopelia cuneata*, Budgerigar *Melopsittacus undulatus*, Crimson Chat *Ephthianura tricolor*, Painted Finch *Emblema pictum* and Zebra Finch *Taeniopygia guttata*.
Social and cultural values: Cultural: The site has Aboriginal significance and has had considerable use in the past. Numerous Aboriginal artefacts and implements were formerly present; many have reportedly been broken or removed. Research: The site was studied during a rangeland condition survey by the Department of Agriculture in 1988 and is the subject of ongoing biological studies by WADCALM.
Land tenure :
On site: Entirely within the Barlee Range Nature Reserve (22796, Class A) for Conservation of Flora and Fauna.
Surrounding area: Barlee Range Nature Reserve and leasehold (Glenflorrie, Maroonah, Ullawarra pastoral stations).
Current land use :
On site: Nature conservation.
Surrounding area: Pastoral grazing.
Disturbances or threats :
Current: Damage by cattle and donkeys.
Potential: Further damage by stock.
Conservation measures taken : WADCALM has received ANCA funding to fence the site in order to exclude stock.
Management authority and jurisdiction : Managed by WADCALM for NPNCA.
Compiler & date : Romeny J. Lynch, c/- Department of Conservation and Land Management, Busselton. July-October 1995.