GOLDEN BANDICOOT
Taxonomy, Distribution in the Kimberley

FINAL REPORT
MAY 1996

by
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INTRODUCTION

Over the years 1994/95 and 1995/96, under the Endangered Species Program of the Australian Nature Conservation Agency (ANCA), funding to a total of $61600 was made available under contract to achieve the following defined objectives;

1. To establish the conservation status of *I. auratus* on mainland Australia by undertaking BIOCLIM predictions, visiting sites from which it has been collected over the past few decades and trapping likely habitats.

2. To obtain samples from Kimberley *I. auratus* for electrophoretic or DNA analysis and comparison with Barrow Island and Augustus Island animals and *I. obesulus* from south west Australia.

3. To obtain data on the habitat requirements, biology and ecology of *I. auratus* in the Kimberley.

Norm McKenzie (Principal Research Scientist - CALM Woodvale) is supervising the second aspect of the project.

Special acknowledgment must be given to Mr David Grosse (Operations Officer - East Kimberley District - CALM) who was the other team member in this project. Mr Grosse gave full and professional support to the task of preparing for field work as well as participating in the field work in remote locations often under trying conditions.

Under the terms of the 1995/96 contract this report constitutes the final report. For comparative purposes all data obtained over the duration of the two year project have been included in this report. Sections of work are not as yet completed, in particular these are; identification of plant collections from the April/May 1996 field trip; final determinations of taxonomic work being undertaken by the South Australian Museum and vegetation maps for one site (George Water).

FIELD WORK

Locations

1. October 1994 (Map 1)

George Water/Glenelg River junction.

The area surveyed was adjacent to a 1988 rainforest survey site (Numbered 23/4).

Freshwater Cove.

Sampled for two nights whilst on the way to Augustus Island.

Augustus Island.

A site was sampled which had been surveyed by the then Department of Fisheries and Wildlife (Western Australia) in the early 1970s.

2. April/May 1995

The George Water location visited in October 1994 was re-visited for a period of three weeks for extended work on a known mainland population.

3. April/May 1996

2.5 km north west of Mt Brookes.

Selected as it falls within the Prince Regent Nature Reserve. This site is 32 kilometres north east of Mt Trafalgar, adjacent to which animals were found in the early 1970's.

Embayment off Prince Frederick Harbour.

The area surveyed was adjacent to a 1988 rainforest survey site (Numbered 14/1). Whilst no animals were collected at that time it was surveyed this time as it represented a different type of rainforest. At this location the rainforest is over Hart dolerite rather than sandstone scree.

7 km north east of Mt Anderdon.

The site showing all of the characteristics of sites where animals had been previously collected.

5.5 km south west of the Mitchell Falls.

This site was selected as it is a low sandstone escarpment abutting a dampland. No typical rainforest community was present though individual species could be found in the area.

Survey Aims

1. October 1994

Undertake trapping to ascertain if the animal was still present at two locations from which it had previously been collected.

Collect morphological data and take tissue samples for subsequent DNA analysis. Hair and ear tissue was collected. There were no facilities available to collect and store blood.

Undertake habitat descriptions with a view to producing BIOCLIM predictions.

2. April/May 1995

Emphasise a contribution to items 2 and 3 within the context of the contract. Specific tasks included;

Collect morphological data and take tissue samples for subsequent DNA analysis. In particular some effort was made to collect blood samples which could, in the first instance, be used for electrophoretic work

Radio track several animals to gather data on habitat use and movements.

3. April/May 1996

Using the knowledge gained from previous field work trap likely sites to add to the distribution picture.

Collect morphological data and take tissue samples for subsequent DNA analysis. Hair and ear tissue was collected. There were no facilities available to collect and store blood.

Transport

For 1994 and 1995 transport to the very remote locations involved driving with a vehicle loaded with equipment to Broome and loading a 25' boat for a two and a half day trip to the locations. In 1994 the crew of the boat assisted in establishing camps, cooking and the placement of traps and were present throughout the trip which lasted two weeks. In 1995 two CALM staff (G Graham and D Grosse) were transported to a single location where a camp was set up for three weeks at the end of which the boat returned for the trip back to Broome.

In 1996 a different approach was adopted in an attempt to survey as many new sites as were feasible. In this case two vehicles, with gear, were driven to a location known as the Mitchell River campsite where a helicopter is based for use during the tourist season. Fuel for the helicopter was available at this location. Using the Mitchell River campsite as a base the helicopter was then used to select possible sites as well as place and monitor traps for a period of ten days.

METHODS

1. Trapping.

Trapping for bandicoots involved large Elliott traps being laid in a series of transects at approximately 20 to 50 pace spacings. The traps were baited with a mixture of rolled oats, peanut butter and honey. Following advice from Parks and Wildlife - Northern Territory concerning Aboriginal techniques of capturing bandicoots emphasis was placed on the use of honey in the mix.

For 1994 and 1995 traps were closed in the early morning (0530 hrs - 0700 hrs) and reopened in the late afternoon (1530hrs - 1700hrs) when fresh bait was added. This was done because of concerns over the potential of animals becoming trapped during the day and suffering from the heat.

Because of costs in 1996 the traps were checked in the morning and left open. Day time temperatures were not excessive and traps were placed in locations where the exposure to the sun was minimised.

2. Identification.

The identification of *I. auratus* was undertaken in the field by cross sectioning the guard hairs of animals and comparing relative hair size and shape with a reference collection. The comparison was done using a binocular microscope. This technique was applied on all field trips.

3. Genetic material and other measurements.

In 1994 and 1996 a small piece of ear tissue and hair samples were taken from each animal caught. In 1995, as well as ear tissue and hair samples, it was possible to collect blood samples. This was possible because of the loan of a large liquid nitrogen container. Blood was collected by slicing the flesh at the base of a middle digit on the front feet.

For all bandicoots captured the following details were taken;

Weight
Rear Pes length
Front Pes length
Sex
Noticeable injuries

4. Radio tracking.

In 1995 animals caught were radio tracked using a Regal 2000 telemetry receiver (Titley Electronics). A small transmitter was glued to the back of each animal using super glue. A small patch of hair was cut away, the transmitter applied to the stubble and the surrounding hair pulled back over the transmitter and glued down. The aerial then trailed down the back in the direction of the tail.

The animals were tracked twice a day over the period from capture/release to departure from the site. On day one the animals were located by triangulation from the mapped trap sites and on day 2 by physically locating the animals. At no time were the animals captured during tracking and could be approached to within a metre before they moved quickly away when disturbed. Even though approached quite closely they were never seen before they moved due to the dense vegetation.

5. Site Descriptions

In 1994 broad site descriptions were given of the areas trapped. This included brief vegetation descriptions and some landscape descriptions.

In 1995 a more intensive survey was applied to the George Water site. Using a tape and compass the trap lines were mapped and photographs were taken of all trap sites. This mapping was tied into points where GPS readings were taken. All vegetation over 2 metres in height within a radius of 40 metres of the camp was mapped.
At each trap site all vegetation over 2 metres in height and to a limit of a radius of 5 metres around each trap was mapped. Voucher specimens were collected.

The areas trapped in 1996 were selected using the knowledge gained mainly from the 1994 and 1995 work. Voucher specimens of plants were collected.

RESULTS

1. Trapping

Trapping dates were as follows;

1994

George Water

15/10/1994	40 traps
16/10/1994	50 traps
18/10/1994	Trapping finished.

Freshwater Cove

20/10/1994 - 21/10/1994	20 traps
22/10/1994	Trapping finished.

Augustus Island

23/10/1994	20 traps
24/10/1994	40 traps
25/10 - 26/10/1994	50 traps
27/10/1994	Trapping finished.

1995

30/04/1995	20 traps
02/05/1995	30 traps
03/05/1995	40 traps
16/05/1995	Trapping finished.

1996

26/04/1996	10 traps
27/04/1996	20 traps
28/04/1996	40 traps
05/05/1996	Trapping finished.

2. Captures

Details of the golden bandicoots trapped are as follows;

LOCATION	DATE	WEIGHT (grm)	INJURY	REAR PES (mm)	FRONT PES (mm)	SEX
George Water Line 1 Trap 7	19/10/1994	845	No tail	55	20	Male
George Water Line 5 Trap 47	19/10/1994	190		40	20	Female Juvenile
Augustus Island Line 3 Trap 35	25/10/1994	345		45	20	Male
George Water Line 2 Trap 2	07/05/1995	985	No tail	37	24	Male
George Water Line 2 Trap 1	09/05/1995	465	Large tick in pouch	44	18	Female
George Water Line 2 Trap 8	13/05/1995	705		41.5	25	Female
Anderdon	30/04/1996	855	No tail	35	25	Female
Anderdon	05/05/1996	930		34	17	Female

One female captured in 1995 was noted to be lactating.

3. Radio Tracking.

In 1995 animals were tracked twice a day. A number of readings when doing triangulations had to be disregarded because of wide discrepancies in the readings obtained. This is most probably due to the terrain and the presence of large boulders throughout the area causing deviations in the signal.

4. Genetic material

On each field trip hair and ear tissue samples were obtained. The hair is retained in zip lock bags and is refrigerated and the ear tissue material is kept in a fixing solution and also refrigerated. Duplicates are kept at the CALM Science and Information division, Woodvale - Western Australia and the CALM Kimberley Region office - Kununurra - Western Australia.

In 1995 a small amount of blood was obtained from three individuals which, until recently, was held at the WA Museum. This material has now been sent to Mark Adams at the South Australian Museum for electrophoretic analysis.

5. Site Descriptions

1994

George Waters.
In general this location was considered to be very dry. There did not appear to be surface freshwater available within the immediate vicinity (This was confirmed in 1995 when a 30 minute trip by dinghy across George Water had to be made in order to obtain fresh water). Much of the vegetation, and particularly the overstorey rainforest species, was in a deciduous state. The other point of note was that the location appeared to have not been affected by fire for some time as evidenced by the lack of fire scars and the dense understorey vegetation.

LOCATION	TOPOGRAPHY	VEGETATION
Line 1	Moderately steep slope. Boulders present but not above grasses.	Open woodland (*Eucalyptus tectifica [?]).* Dense grasses to 1.5 metres including *Heteropogon contortus.* Also present was a lot of dodder (*Cuscuta sp.*) and extensive and thick growths of a woody creeper (awaiting identification). Small clumps of rainforest vegetation (trees and vines) also present.
Line 2	In steep sided gully (6 metres deep at bottom of slope). Gully has water flowing in it in the wet.	Top of banks have an open woodland (*Eucalyptus tectifica [?]).* Banks have dense grass to 1.5 metres and exposed boulders. Bottom of gully has a variety of riparian and rainforest trees (*Ficus, Albizia sp.* [in flower]).
Line 3	Moderately steep slope. Exposed boulders present and small, flatter areas devoid of vegetation.	Open woodland (*Eucalyptus tectifica [?]).* Dense grasses to 1.5 metres including *Heteropogon contortus.* Noticeable reduction in the woody vine and dodder compared to line 1. Clumps of rainforest vegetation adjacent to the line.
Line 4	Moderately steep slope similar to line 3. Line crosses a shallow, narrow creek. Line runs diagonally up the slope.	Open woodland (*Eucalyptus tectifica [?]).* Dense grasses to 1.5 metres including *Heteropogon contortus.* Noticeable reduction in the woody vine and dodder compared to line 1. Clumps of rainforest vegetation adjacent to the line.
Line 5 Photo 2	Very steep slope adjacent to camp site. Line runs directly up the side of the hill. Exposed rock toward the top.	Dense grasses to 1.5 metres including *Heteropogon contortus,* no overstorey. Some woody vine and dodder at the bottom of the slope.

Augustus Island.

This location had similarities with the George Waters site but had a greater variety of vegetation types and landform. This area lacked the woody vine and dodder. The area appeared to have not been affected by fire for some time.

LOCATION	TOPOGRAPHY	VEGETATION
Line 1	Line ran from flat sandstone with little soil and some boulders to; gentle valley with a small creek in the centre with deep grey sandy soil.	Line ran for area dominated by large spinifex clumps to; Mid-dense woodland of *Eucalyptus aff. polycarpa* with very little understorey but a thick leaf litter layer to; *Pandanus sp., Acacia sp* and *Eucalyptus sp.* woodland with dense grass to 2 metres. The litter layer was aerated and dense (50 cm.) made up of mostly fallen grasses.
Line 2	Line ran along the bottom of a very steep slope with many large sandstone boulders into a relatively flat area.	There was a great deal of variation in the vegetation along this line starting with an overstorey of rainforest trees with scattered vines (*Jacksonia ?* also present). An open woodland in parts with *Eucalyptus miniata* present with very little understorey present. Where the line passes along rainforest there is little overstorey but has dense low grasses and finally under the rainforest canopy there is no understorey but thick litter layer.
Line 3	Line passed diagonally across a very steep, boulder strewn slope ending at the base of sheer cliff.	Variety of vegetation including; *Eucalyptus sp, Jacksonia? sp.,* rainforest trees and vine, some patches of grass and spinifex (*Plectrachne pungens*).
Line 4	Line passed directly down the steep slope and across a sandy flat valley into another flat area but which has sandstone boulders present.	At the top the line runs along the boundary between a rainforest patch and dense *Plectrachne pungens*, through a vine thicket with no understorey, into a *Eucalyptus tectifica?* woodland with scattered grasses to 50 centimetres and then into an *Acacia sp.* woodland with low dense spinifex.

1995

General notes on the vegetation at George Water showed that the area has not been burnt for some time. The vegetation can broadly be described as an open woodland over dense tall grasses interspersed with patches of rainforest of varying sizes. It was clear that a number of rainforest species (notably creepers/scramblers) not seen in October 1994 were present in the woodland. Whilst there is still a distinct boundary between rainforest and woodland, annual rainforest species did extend into the woodland. The following plant identifications were undertaken by Daphne Edinger from the WA Herbarium.

PLANT LIST - GEORGE WATER
MAY 1995

(Plants listed alphabetically by family.
P1, P2 etc are the collection numbers for the George Water site.)

Acanthaceae

Dicliptera armata
Herb to 1.5 metres in dense tall grasses. Purple flowers off 'lantern'. (P28)

Adiantaceae

Cheilanthes pumilio
Ferns found growing under a rock ledge north of the campsite. (P65)

Apocynaceae

Ervatamia orientalis?
Shrub to 2.5 metres. Pale grey, 'bumpy' bark. Distinct alternate veins off strong central vein on leaves. Small jasmine-like flowers. Leaves opposite. White, milky sap. *[Tabernaemontana pandacaqui]* (P60,P68)

Bixaceae

Cochlospermum fraseri **Kapok Tree, Cotton Tree**
(P52)

Caesalpiniaceae

Chamaecrista mimosoides **Fiveleaf Cassia**
Fern-like leaves on shrub to 0.5 metres. (P33)

Celastraceae

Cassine melanocarpa
Tree to 6 metres. Blotchy grey bark becoming dark and rough at the base of the trunk. Small white flowers. Fruit like a slightly elongated green grape. (P74)

Combretaceae

Terminalia canescens
Single stemmed shrub to 3 metres. More bush like than P37. Rough, flaky bark. (P38)
Terminalia sp.
Single stemmed, spreading bush to 2 metres. Ovate? leaves. Leaves mid-green all over. (P44)

Convolvulaceae

Merremia hederacea
Scrambling creeper. Red soil with boulders. Found throughout the grass understorey. White flowers. This plant is mentioned in 'Flora of the Kimberley Region' as "a single record from a swamp near Beagle Bay Mission". (P3)

Operculina sp
Scrambling creeper/vine on edge of grassland and in rainforest patch. Large globular fruit. (P21)

Xenostegia tridentata
Scrambling creeper in grass. (P14)

Cucurbitaceae

Mukia maderaspatana
Scrambling creeper in grass understorey. (P9)

Euphorbiaceae

Antidesma ghaesembilla
Bush to 4 metres. Strong trunks with deeply fissured and dark bark. Leaves glossy dark green. Fruit small ball shaped ripening to purple black. (P62) ALSO; Shrub to 2.5 metres. Mid-grey slightly fissured bark. Pale green leaves. (P63)

Breynia cernua
Tree to 10 metres. Red soil with boulders. Southern slope. Fissured dark bark. (P1)

Croton habrophyllus
Bush. Sometimes 2-3 stems with strong stem formation. To 3 metres. Blotchy pale to mid-grey bark. (P41,P51)

Flueggea virosa
Shrub to 2 metres. (P20)

Petalostigma pubescens **Quinine Tree, Quinine Berry**
Single stemmed shrub to 2.5 metres. Leaves 5 centimetres in length. Rough, large flaked bark. (P40)

Phyllanthus virgatus
Small annual to 1 metre. Simple leaves alternate on stems. (P64)

Goodeniaceae

Goodenia sepalosa
Edge of vine thicket in grass. Bright yellow flowers. (P11,P69)

Lauraceae

Cassytha sp. **Dodder Laurel**
(P35)

Malvaceae

Thespesia populneoides
'Mallee' type shrub to 1.5 metres. (P4)

Mimosaceae

Acacia pachyphloia
Tree to 10 metres. Corky bark. Many very small leaves and a drooping habit. This species has been described previously as being uncommon. (P50)

A. stigmatophylla
Straggly shrub to 2 metres. (P53)

Albizia lebbeck **Indian Siris**
Small tree to 4 metres in woodland and in rainforest to 12 metres. (P17)

Moraceae

Ficus opposita **Sandpaper Fig**
Small shrubby tree to 2 metres. Sandpaper leaves. (P23)

Myrtaceae

Eucalyptus tectifica **Darwin Box**
Tree to 20 metres. Lanceolate grey/green leaves. Dense fibrous grey bark. (P24)

Eucalyptus sp.
Tree to 12 metres. Flaky pale grey/brown bark on trunk. Branch bark white. (P15)

Eucalyptus sp.
Large eucalypt to 15 metres. Grey tessellate bark all over. (P18)

Eucalyptus sp.
Tree to 15 metres. Rough dark bark all over tree. Urn-like fruit larger than P15 fruit but lip is not as pronounced. (P27)

Eucalyptus sp.
Very similar to P24 in trunk, bark, form etc but much broader and larger leaves. (P45)

Eucalyptus sp.
Tree to 10 metres. Cup like fruit. Similar to P15 but with pale grey flaky bark extending in patches to branches. (P49)

Oleaceae

Jasminum sp.
Woody vine found throughout the grass understorey. Red soil with boulders. Southern slope. (P2)

Papilionaceae

Cajanus lanceolatus
Very narrow lanceolate leaves. Straggly shrub to 1 metre. This plant is endemic to the Kimberley region. (P32,P59)

Crotalaria retusa **Wedgeleaf Rattlepod**
Single stemmed to 1.5 metres. (P34)

Crotalaria sp.
Rattle pod in heavy grass. Whole plant collected. Small pods. (P13)

Indigofera hirsuta **Hairy Indigo**
Scraggly annual. Orange pea-type flowers and pea pods. (57)

I. linifolia
Small annual to 0.5 metres. Pale grey green plant with bright pink/red small pea-like flowers. (P56)

Passifloraceae

Adenia heterophylla
Broad-leafed creeper growing over a large dead eucalypt. (P22,P29)

Poaceae

Cenchrus sp.
Grass from top of ridge north of the camp. Bunch grass to 2 metres. (P39)

Proteaceae

Hakea arborescens (?)
Tall bush to 6 metres. Long, narrow grey/green leaves. Deeply fissured grey bark on trunk diminishing along branches and no fissures on branchlets. (P47)

Rhamnaceae

Ziziphus quadrilocularis
Single stemmed bush. Inverted pine-like form. Very symmetric. Leaves alternate along braches. Leaves dark green and lighter on the underside. Three veins along leaf emanating from where leaf joins the branchlet. Single spike at this join. (P46)

Rubiaceae

Aidia racemosa
Main stemmed bush with long lanceolate glossy leaves. (P67)

Gardenia sp.
Tall bush to 4 metres. Large, ovate?, mid to dark green, terminal bunches of leaves. (P73)

Spermacoce sp.
(P12)

Sapindaceae

Atalaya hemiglauca **Whitewood**
'Shrubby' tree to 2 metres. Almost smooth pale grey bark. (P55)
A. variifolia
Single stemmed to a crown at 2 metres. Branches? have phyllode extensions with more 'leaves' running off them. (P66)

Dodonaea lanceolata
Dense shrub to 3 metres. Glossy leaves slightly wrinkled. (P19,P75)

Scrophulariaceae

Buchnera sp.
Single stemmed annual to 1 metres in grassland. Group of pure white flowers bunched at the top of the stem. (P54)

Tiliaceae

Grewia retusifolia
Shrub to 0.5 metres. Hairy appearance to leaves, serrated edge, paler on underside. (P31)

Ulmaceae

Celtis philippensis
Holly leaf. Scraggly shrub to 2 metres. (P26)

Verbenaceae

Premna acuminata
Single stemmed straggly shrub to 1.5 metres. Extended heart shaped leaf with distinct venation. Slightly paler underside of the leaf. (P43,P61)

Vitex glabrata

Tree to 6 metres. Even, slightly curved venation to leaves. Slightly pale underside to the leaves. Blotchy grey bark. (P70)

Vitaceae

Ampelocissus acetosa

Native grape? Scrambling creeper up trees. (P25,P71)

Cayratia trifolia

Scrambling vine at the edge of rainforest patch. (P8)

1996

An expert on carnivorous plants, Mr Allan Lowrie, was present as a volunteer on this trip and he was responsible for voucher collections of suitable material for each of the sites but these have not, as yet, been identified. As an adjunct to the trip Mr Lowrie made some important discoveries within his field of expertise.

CONCLUSIONS AND DISCUSSION.

1. ***I. auratus* persists on the mainland of the north west Kimberley.**

2. ***I. auratus* is still present on Augustus Island (north west Kimberley)**

3. **The habitat type for this animal appears to be a combination of woodland and rainforest in rugged country.**

4. **This habitat occupies a small total area but is widespread through the north west Kimberley and is readily identified as a distinct niche in the landscape.**

5. **From this it is concluded that *I. auratus* is likely to be widespread but localised within what is a very small percentage of its former distribution (see Strahan 1995).**

6. **There is some evidence to suggest that the animal seems to have a susceptibility to local extinctions (fire, cats etc.).**

7. **The two now known mainland populations should be monitored every 5 years or so and attempts should be made to locate further populations at sites consistent with current habitat descriptions in more readily accessible areas. Some possible sites are listed below.**

Whilst limited, this study supports the view that the mainland population of the golden bandicoot is restricted in distribution to the more coastal areas of the north west Kimberley. Continued work on this subject is then confined by the remote and rugged nature of this region where study is expensive and logistically difficult.

It is considered that if a population of bandicoots is present at a site then the current technique of using Elliott traps with a predominantly honey based bait will result in their capture. This is further evidenced by the re-captures that were obtained. It does appear that there is a 3 to 4 day delay before the first animals are captured and the presence of a full moon seriously diminishes trapping success. This latter factor may have affected trapping success in 1996 as delays caused by floodwaters in getting to the Mitchell Plateau resulted in trapping taking place on a full moon cycle. The re-surveying of two sites where they had been found in the past (George Water, Augustus Island) found the animal to still be present. The work in 1996 added a further site to that list.

Radio tracking of animal movement in 1995 indicated that the bandicoots had defined areas of activity, centred on a nest site, with brief forays into adjoining territories. Whilst both sexes undertook these forays it appeared that the male was more likely to undertake this movement more often. As a result of the tracking two nests were found. As has been mentioned in previous reports these nests broadly fitted the description given by G. Gordon in 'The Australian Museum Complete Book of Australian Mammals (Strahan Ed.) for *I. macrourus*;

> '... a well concealed nest consisting of a heap of ground litter over a shallow depression, providing an internal chamber with loose regions at each end for entry and exit.'

In this case the nests were made up of twigs and leaves found underneath the dense grass in the woodland. Three things were noteworthy; firstly no grass appeared to be used in the construction, secondly the material appeared to have been collected and transported to the site (the material did not appear to be the same as the litter material in the immediate vicinity and the amount used indicated that it would have to be collected) and lastly the nests were up against small boulders.

As mentioned the blood samples collected are currently undergoing analysis. This work will contribute an extremely important piece to the taxonomic jigsaw that exists for this genera. It is hoped that the retention of hair and tissue samples will allow for more detailed DNA analysis to take place if this becomes economically feasible.

The work which has been undertaken also provides further information on the habitat requirements of this animal and guidance on their conservation management. As a rule of thumb the criteria used to select 'typical' habitats to be surveyed had the following broad criteria;

> Dense, unburnt grassland (or a habitat giving very good low level cover) adjacent to, or mixed with, areas of rainforest.
>
> Steep boulder strewn scree slope abutting tall escarpments.
>
> Near coastal.

Aspect may also be a factor. All sites where animals were trapped had a tendency for a southerly aspect. A site selected in 1996 on the Prince Regent Nature Reserve was a good candidate but disappointingly proved a failure and this may be because this location had a northerly aspect.

It is unclear whether the golden bandicoot can be considered to be a rainforest species. Historically this has not been the case. Certainly rainforest areas are used for foraging and, when being pursued by researchers, as a means of rapidly leaving the location. This latter is facilitated by the open nature, at ground level, of the Kimberley rainforests.

Why are these creatures still found where they are and, following on from that, what might be the major threatening factors to their future survival? As has been stated, the north west Kimberley coast is remote and rugged. At the local scale it provides a wide variety of habitats and refugia. Within a single valley there may be sparsely vegetated sandstone, riparian vegetation, woodland and rainforest. These habitats may be self protecting from influences such as fire because they are separated from each other by sandstone ridges often mostly devoid of vegetation.

It is theorised that the presence of the localised persistence of the bandicoot at sites in the north west Kimberley is operating through the interaction of two factors, these being predation and cover. It is suggested that if the animals has good cover it is able to move more quickly away from danger through the dense understorey than their potential predators such as dingoes and cats. The removal of that protection through inappropriate fire regimes, for example, may lead to the loss of a population from a site.

Of concern is the spread of 'feral' cattle and donkeys into the more remote areas of the north west Kimberley. These animals change the habitat they occupy, and for the more fragile refugia this includes rainforest and riparian habitats. The opening up of these locations through introduced stock use aids the spread of grasses. There is presently increasing indications that the late, large dry season fires experienced in the Kimberley are leading to the deterioration of various habitats. The presence of fire in creating and maintaining the Kimberley biota is widely accepted, however, there does appear to have been a shift in fire timing and intensity away from burning immediately after the wet season in small areas to the hotter, late dry season.

Importantly the 1996 survey contributed to future options for study of these matters. There is now a known population which is accessible in 20 minutes by helicopter rather than 3 days by boat. The Anderdon site is also noteworthy because the rainforest/woodland interface surveyed was less than 1/20th of that available. Ostensibly there should be a good population of animals present.

Apart from completing vegetation and radio tracking maps, taxonomic work and plant identifications it is hoped that over the next two years scientific papers will be produced for publication in suitable journals etcetera. An addendum which will include the data from the work so far completed will be forwarded to ANCA by 31 August 1996. It is also intended that some opportunistic trapping will continue to take place to be linked with other field activities. As has been mentioned in previous reports the locations which should be surveyed include;

areas adjacent to Lone Dingo rainforest patch - Mitchell Plateau.

areas due west of Drysdale River Station homestead and adjacent to the eastern boundary of the Prince Regent Nature Reserve.

Bachsten Creek area on the southern and south eastern boundaries of the Prince Regent Nature Reserve.

Gordon Graham
ECOLOGIST
KIMBERLEY REGION

15 May 1996