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

26 April 1996

Location 1 (26/4) Anderdon
51L 766467
8347990

10 traps in place. Escarpment to long, good quality rainforest to dense tall grass. Boulder strewn scree slope.

27 April 1996
Location 2 (27/4) Point
(51L) 745013
8345056

To Date:
22/4/96 Kununurra to Durack River with a stay overnight. Durack River in flood.
23/4/96 Overnight again at Durack River because of flooding.
24/4/96 Durack River to Miners Pool. Dragged the Rodeo across the Durack River cold with the water waist deep.
25/4/96 Miners Pool to Kinge Edward River crossing. King Edward River in flood.
26/4/96 Chopper (Bell 47[Kawasaki]) picked us up. One site put in.
27/4/96 King Edward to Little Mertens. Dragged Rodeo across the King Edward River cold with the water flowing fast and waist deep. Cable snapped. Vehicle flooded to seat level. Had done a helicopter run. Coming off the escarpment very washed out with areas of blacksoil flooded on the flat.

28/4/96

Passiflora foetida found adjacent to sites 27/4 and 28/4/1 (Cairn). *Litoria rothii* recorded on sandstone flat below site 27/4 with pockets of shallow soil with many small annual plants. These pockets appear to be ephemeral water collecting sites. A possible sighting of a Monjon was noted at site 28/4/2 (Wildcard).

29/4/96

GPS reading at site 28/4/2
51L 785339
8356595

28/4/2 is a low sandstone escarpment with a ephemeral wet woodland at its base. *Eucalyptus papuana, E. polycarpa, Grevillea pteridifolia.* The traps were placed at the base of the sandstone escarpment. *Pandandus spiralis?* Sedgeland.

30/4/96

I. auratus captured at site 26/4. Site is the 'typical' location. Ear tissue is in vial 24 .
Weight 855 gram. Female - no tail.
FPES 25mm
RPES 30mm
Mid dorsal length 33 cm.

Animal released at this site.

1/5/96

Large orb spider collected from inside the rainforest patch at 26/4. Quite a number of these animals hanging in the middle of large webs. 1/web. Small spider noticed on one web - male? Females predominantly black with bright yellow joints most noticeable on ventral surfaces. One animal seen feeding on a small red wasp.

2/5/96

Mt Trafalgar.
GPS 51L 722082
8309679

Site 28/4/1 (Mt Brookes - Cairn)
GPS (at centre of cairn) 51L 755088
8320227

Frog collected at high site seepage area just west of 28/4/1.
GPS 51L 754283
8320297

3/5/96

No result

2 frogs collected at the campsite.
GPS 51L 792641
8359867

5/5/96

Anderdon Site.
Recapture of above animal.

I. auratus 930g female with tail.
Ear tissue in vial 9.
FPES 22mm
RPES (17) 34mm

GOLDEN BANDICOOT
Taxonomy, Distribution in the Kimberley

ANNUAL REPORT
1995

by
G. Graham

Department of Conservation and Land Management
Kimberley Region
PO Box 942, Kununurra, WA 6743

INTRODUCTION

The golden bandicoot (*Isoodon auratus*) has contracted to less than 1 percent of its geographic range on the mainland of Australia since the time of European settlement. It has disappeared from all except the exceedingly rugged sandstone boulder country of the far north west Kimberley.

Its status in that country is not clear. The animal is known from a few scattered localities as recently as 1988, but was not relocated at a 1974 locality revisited in 1988 (Mt Trafalgar). There is evidence that the Australia wide on-going decline in medium sized mammals has begun in the north west Kimberley.

There are two known island populations in Western Australia (Augustus Island and Barrow Island). The Augustus population is based on a single capture in 1972 (Ref; Bulletin 1978 Kimberley Islands) The island has been burnt several times since and the persistence of this population had not been checked. The Barrow Island population is extensive and monitored annually, but has been assigned to a different subspecies (I. a. barrowensis). The mainland reintroduction programmes into the western deserts have had to be based on individuals drawn from the Barrow Island population

This species must be considered among the most threatened of all Australia's extant fauna.

Under the Endangered Species Program funding of the Australian Nature Conservation Agency a total of $26800 was made available for the financial year 1994/95 to achieve the following defined objectives;

1. To establish the conservation status of *I. auratus* on mainland Australia by undertaking bioclimatic 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.

LIAISON

Extensive liaison has occurred throughout the year. Individuals and organisations assisted with all the phases of the project completed to date including literature searches, equipment purchases, field trip logistics, field work design, treatment of samples and media liaison. Examples of the assistance received includes;

Kununurra District High School - Loan and supply of scientific equipment.
Department of Agriculture (Kununurra) - Loan of microscope.
Science and Information Division CALM - Field identification and trapping techniques.
Museum of Western Australia - Inspection of collections.

In particular discussions have taken place with John Woinarski and Carol Palmer from the Conservation Commission of the Northern Territory concerning their successful work on the Wessel Islands.

There have also been extensive discussions on the treatment of any tissue samples collected for both electrophoretic and DNA sampling.

FIELD WORK

The locations visited during the period 13 October to 28 October 1994 were adjacent to George Water at the junction with the Glenelg River, Freshwater Cove, and Augustus Island (see map 1). The main tasks defined prior to setting out on the field trip were;

Undertake trapping to ascertain if the animal is still present at two locations from which it has previously been collected. (*Two animals trapped and released at George Water, one at Augustus Island*)

Collect morphological data and take tissue samples for subsequent DNA analysis. (*Hair follicle samples obtained, tissue [ear tips] held in solution*)

Radio track several animals to gather data on habitat use and movements. (*Insufficient time for this work to be undertaken*)

Undertake habitat descriptions with a view to producing BIOCLIM predictions. (*Preliminary broad habitat descriptions*)

Methods

At all sites, large Elliott traps were laid in a series of transects at approximately 20 pace spacing across as many habitats as possible. The traps were baited with a mixture of rolled oats, peanut butter and honey. Honey was used liberally following advice from the CCNT team and their success with the use of 'sugarbag'. Traps were closed during the morning (usually from 0530 hrs to 0700 hrs) and reopened in the late afternoon (1530hrs to 1700hrs) when fresh bait was added. A problem encountered was the large variety and number of ants which were attracted to the traps. There is no indication of whether or not this affected trap success rates.

Trapping dates were as follows;

George Water

15/10/1994	(40 traps)
16/10 - 18/10/1994	(50 traps)

Freshwater Cove

20/10 - 21/10/1994	(20 traps)

Augustus Island

23/10/1994	(20 traps)
24/10/1994	(40 traps)
25/10 - 26/10/1994	(50 traps)

The identification of *I. auratus* was undertaken in the field by cross sectioning the guard hairs of animals and comparing relative diameters and shapes with a reference collection. The comparison was done using a binocular microscope.

For all bandicoots captured the following details were taken;

Weight
SV length
TV length
Rear Pes length
Front Pes length
Sex
Noticeable injuries

Duplicate sterile hair samples were taken (kept in 'zip-lock plastic bags). As well a small amount of ear tissue (kept in tissue solution) was kept from golden bandicoots. One of the duplicates of these tissue

samples for each animal has been forwarded to Norm McKenzie at the Wildlife Research Centre - CALM - Woodvale and the other sample has been retained at the CALM - Kununurra office.

Locations

George Water/Glenelg River junction.
Map 2

This site was selected at the suggestion of Norm McKenzie (Principal Research Scientist - CALM Woodvale). During the June 1988 rainforest survey two animals were collected - 1 adult male and 1 juvenile female. This constituted the most recent mainland collection of the species so its continued presence at this site is of importance. The area surveyed this time was adjacent to the 1988 rainforest survey site 23/4. Traps were placed at the grid references given for the 1988 collections.

In general this location was considered to be very dry. No freshwater was found within the immediate vicinity. Much of the vegetation was in a deciduous state including overstorey rainforest species. The other point of note was that the location appears to have not been affected by fire for some time.

Freshwater Cove.
Map 3

A stopover at this cove took place in order to collect drinking water. The area was sampled for two nights but no bandicoots were trapped.

As the name suggests this area has permanent freshwater available. The edge of the creek which runs away from the beach is peaty and wet. Freshwater pools can be found along the creek itself. The vegetation is completely different to the other two sites. Adjacent to the wetter areas there were large numbers of dead mature *Banksia dentata* with only small plants noticed as being alive. There was some evidence that the area had been affected by fire within the last two years.

Augustus Island.
Map 4

A single animal was trapped on this island during survey work on islands of the northwest Kimberley undertaken by the then Department of Fisheries and Wildlife in the early 1970s. It is the only island on which the animal was recorded during this survey. Once again the exact site of the 1970s collection was surveyed.

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

Results

Three animals identified in the field as golden bandicoots (*Isoodon auratus*) were trapped. Details are as follows;

LOCATION	DATE	WEIGHT (grm)	SV (mm)	TV (mm)	REAR PES (mm)	FRONT PES (mm)	SEX
Animal 1 George Water Line 1 Trap 7	19/10/1994	845	230	N/A	55	20	Male
Animal 2 George Water Line 5 Trap 47	19/10/1994	190	150	95	40	20	Female Juvenile
Animal 3 Augustus Island Line 3 Trap 35	25/10/1994	345	205	115	45	20	Male

All the animals appeared to be in good condition, however, the large male from George Water did not have a tail and had a circular scar approximately 2 centimetres in diameter on its rear left flank.

The site descriptions for those locations where animals were trapped is as follows;

George Water

LOCATION	PHYSICAL FEATURES	VEGETATION
Animal 1 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 is a lot of dodder (*Cuscuta sp.*) and extensive and thick growths of a woody creeper. Small clumps of rainforest vegetation (trees and vines) also present.
Animal 2 Line 5	Very steep slope adjacent to camp site. Exposed rock toward the top.	Dense grasses to 1.5 metres including *Heteropogon contortus*, no overstorey. Some woody creeper and dodder at the bottom of the slope.

Augustus Island

LOCATION	PHYSICAL FEATURES	VEGETATION
Animal 3 Line 3	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*).

Other animals.

Two northern brown bandicoots (*Isoodon macrourus*) were trapped at the George Water/Glenelg River site. One of these animals was identified from hair only after it had successfully forced the Elliott trap door open. Details of the animal measured are;

LOCATION	DATE	WEIGHT (grm)	SV (mm)	TV (mm)	REAR PES (mm)	FRONT PES (mm)	SEX
George Water Line 1 Trap 5	17/10/1994	1300	350	190	75	45	Male

Other mammals trapped were;

LOCATION	DATE	SPECIES	SEX	COMMENTS
George Water Line 1	18/10/1994	*Zyzomys argurus* Common Rock Rat	Male	
George Water Line 1	18/10/1994	*Zyzomys argurus* Common Rock Rat	Male	
George Water Line 2	19/10/1994	*Dasyurus hallucatus ?* Northern Quoll		Tail only found in the trap, awaiting confirmation.
Freshwater Cove Line 2	21/10/1994	*Dasyurus hallucatus* Northern Quoll	Male	
Freshwater Cove Line 2	22/10/1994	*Dasyurus hallucatus* Northern Quoll	Female	Four hairless young attached to teats
Freshwater Cove Line 2	22/10/1994	*Zyzomys argurus* Common Rock Rat	Male	No tail
Freshwater Cover Line 1	22/10/1994	*Zyzomys argurus* Common Rock Rat	Male	No tail
Augustus Island Line 3	25/10/1994	*Zyzomys woodwardi* Large Rock Rat	Male	
Augustus Island Line 2	25/10/1994	*Zyzomys argurus* Common Rock Rat	Male	
Augustus Island Line 5	25/10/1994	*Zyzomys argurus* Common Rock Rat	Male	
Augustus Island Line 3	26/10/1994	*Zyzomys woodwardi* Large Rock Rat	Male	
Augustus Island Line 1	26/10/1994	*Melomys burtoni ?*	Female	In dense grass with thick litter layer. Pandanus nearby.
Augustus Island Line 5	26/10/1994	*Zyzomys argurus* Common Rock Rat	Male	

Temperatures

Date	Location	Maximum (°C)	Minimum (°C)
14/10/1994	George Water	44	--
15/10/1994	" "	40.5	23
16/10/1994	" "	37.5	23
17/10/1994	" "	39	26
18/10/1994	" "	37.5	24
19/10/1994	" "	39	26
23/10/1994	Augustus Island	43	26
24/10/1994	" "	45.5	25
25/10/1994	" "	44.5	26
26/10/1994	" "	--	26

1994/95 Programme

Within the context of the 1994/95 funding a further visit to George Water is planned for the end of April - May 1995. Tasks identified for this field work are;

Seasonal comparison in trapping success (end of the wet season versus end of the dry season).

Radio tracking for at least two weeks to obtain habitat and movement data.

Detailed habitat work including extensive vegetation collections and descriptions of the physical characteristics. The plant collections will be assessed by the WA Herbarium (CALM).

Extra funds will be used to obtain blood samples

Broad Strategy 1995-96

Further work will be undertaken on obtaining distributional data for the golden bandicoot. It is clear that substantial savings can be made if a population can be found which is accessible by vehicle. This would allow the establishment of good facilities for more long term habitat and behavioural studies.

The outline for the 1995/96 funding is as follows;

Taxonomic work.

Trap at;

Mitchell Plateau
West of Drysdale River Station
North west of Mt Elizabeth Station
North of Mt Hart
Consider a boat based survey of the Prince Regent area.
Optional - east of Kalumburu

Gordon Graham
ECOLOGIST
KIMBERLEY REGION

2 March 1995

GOLDEN BANDICOOT - ROUGH DATA - APRIL/MAY 1995

Friday - 28.4.1995
Arrived George Water - 0930 hrs aboard Simara II - Chris (Rocka) Neylon skipper. Peter Tucker offsider.
Arranged SKED times on RFDS (5300) Derby for 0830 when Simara II making the return journey.
SKED with Ian Solomon (Kimberley 9/Bungles base). SKED on 29.4.1995 at 0830 & 1700 hrs. High tide (day) at 1200 hrs.

Campsite Lat/Long: 15°48.4'S
124°43.5'E

Saturday - 29.4.1995
Simara II departed at 0830 hrs. SKED with IS. Not able to activate phone connect through Broome.
Max temp: 38°c. High tide: 12.35 hrs.

Sunday - 30.4.1995
Min temp: 22°c. Max temp: 38.5°c. High tide: 1305 hrs. Lines 1 & 3 set.

Monday - 1.5.1995
Min temp: 22°c. Max temp: 38.5°c. High tide: 1335 hrs.

Tuesday - 2.5.1995
Min temp: 24°c. Max temp: 39°c. High tide: 14.10 hrs. Line 2 in place. 1x 12' estuarine crocodile at freshwater collection site.

Wednesday - 3.5.1995
Min temp: 25°c. Max temp: 36.5°c. High tide: 14.35 hrs. 1x 8' estuarine crocodile at freshwater collection site.

Thursday - 4.5.1995
Min temp: 24°c. Max temp: 28 °c. Slight rain in the previous evening at approx 1930 hrs.
Top end of line 2: *Zyzomys sp (?)*. Large protuberant eyes. Thick tail where it joins body. Distinct nose. Light brown above and pale underneath.
1/3 of way along line 1: *Rattus tunneyi (?)*. Long black guard hairs over a mid-dark brown coat. 'Short' face. Mosaic pattern on tail. Light rain began at 1730 hrs (no wind).

Friday - 5.5.1995
Min temp: 19.5°c. Max temp: 35°c. High tide: 15.15 hrs.
Line 1 Trap 2 (No. on trap 15): *Rattus tunneyi (?)*.

Saturday - 6.5.1995
Min temp: 21°c. Max temp: 31.5°c. High tide: 15.40 hrs.
L4T1: *Melomys sp(?)*. Grey head and light to golden brown body.
L2T1: *Zyzomys sp (?)*.
L2 T8: Golden backed Tree Rat.

Sunday - 7.5.1995

Min temp: 20^{0}c. Max temp: 35^{0}c.
L1T3 - *Rattus tunneyi (?).*
L2T5 - Quoll.
L2T2 - Bandicoot - Hair ID inconclusive on the first slide. Slide shows equal amounts of northern brown and golden. 3rd slide shows it appears to be golden - treated as such. **S1/95**
L3T8 - Quoll. - 490g female
L4T1 - *Melomys sp. (?).* 60g female. Even brown all over. Well developed teats.
L4T10 - Quoll. - 580g male.

Monday - 8.7.1995
Min temp: 21^{0}c. Max temp: 36.5^{0}c.

Tuesday - 9.7.1995
L2T5 - Quoll. 490g female.
L2T1 - Bandicoot **S2/95**

Wednesday - 10.5.1995
Min temp: 21.5^{0}c. Max temp: 37.5^{0}c. Very humid.
Other animals collected *Rattus tunneyi (?)* (130g male) and Quoll (530g male).

Thursday - 11.5.1995
Min temp: 24^{0}c. Max temp: 36^{0}c.

Friday - 12.5.1995
Min temp: 24^{0}c. Max temp: 36^{0}c.

Saturday - 13.5.1995
Min temp: 24^{0}c. Max temp: 36^{0}c.
L2T2 - Quoll
L3T1 - Quoll
L2T8 - Bandicoot **S3/95.** This trap is in a small patch of rainforest.

Sunday - 14.5.1995
Min temp: 23^{0}c. Max temp: 35^{0}c.
Traps left closed overnight. Decision to take bearings only on RT to see if disturbance is a problem.

Monday - 15.5.1995
Min temp: 23.5^{0}c. Max temp: 36^{0}c.
L3T8 - *Rattus tunneyi(?)*
L2T8 - Quoll
L2T3 - Quoll
Arachnid collected at camp. Looks identical to a green ant. Moves along branches, twigs etc and flinches (behaves) the same way as green ants. Placed in alcohol/glycerine/water in venoject box separate to the other tubes.

Tuesday - 16.5.1995

Min temp: 24^0c. Max temp: 35^0c.
RFDS CALM radio call sign. Victor Kilo Whiskey 426. Kimberley 4.

Wednesday - 17.5.1995
Min temp: 25^0c. Max temp: ^{0}c.
Animals tracked overnight. **S1/95** & **S3/95** moved widely. **S2/95** didn't appear to move much at all. **S3/95** just north of Line 1 on the drop off to the 'beach'. **S1/95** moved down to near Line 2 and then very close to Camp.

S1/95
985g male. No tail.
FPES 24mm.
RPES 37mm. (Heal to bottom of middle digit = 14mm.)
Mid dorsal measurement not taken - animal active. Very small amount of blood in nitrogen. Ear piece in number 1 of tissue solution containers. Radio transmitter frequency 150.480

S2/95
465g female. No injuries. Large tick in pouch.
FPES 18mm. (to end of toe not nail). 12mm. (to bottom of middle toe).
RPES 44mm. 35mm.
Blood and ear samples taken. Ear sample in number 2 of tissue solution container. Radio transmitter frequency 150.502.

S3/95
705g Lactating female. No injuries.
FPES 25mm. 12mm.
RPES 60mm. 41.5mm.
Blood and ear samples taken. Ear sample in number 8 of tissue solution container. Radio transmitter frequency 150.441.

Notes (8.5.1995)
At 1630 hrs **S1** found under sandstone rubble in grassland at the edge of a small rainforest pocket. A number of rainforest patches through this area. Towards the top of the escarpment north north east of the camp. 90 metres from camp @ 15^0. and 135 metres from L2T1 @ 310^0. Steep slope.

Notes (9.5.1995)
S1 located in amongst dense grass and rubble on the north side of a large rainforest patch. Within 2 metres of the edge of this patch. When disturbed ran off approximately 20 metres into large rainforest patch. When tracking appeared to be moving along the edge of the patch to the north. First located 160 metres from camp @ 310^0. and 260 metres from L2T1 @ 292^0.

Notes (10.5.1995)
In the morning found underneath huge sandstone boulder. Approximately 3 metes into a large rainforest pocket just below the ridge crest due north of the campsite.
During the PM. readings it was noticed that the animal appeared active at 1700 hrs.

Notes (11.5.1995)
In the morning the animal had moved east and downslope from the am reading of the previous day.

In the afternoon first contact was 10 metres north of L2T8. Moved quickly through open rainforest to east and went to ground in very dense grass (to 1.5 metres). A large rainforest patch 2 metres to the north. Very steep slope with many sandstone rocks. 14 metres from L2T5 @ 321^0.

Notes (12.5.1995)
In the afternoon under dense grass on steep slope approx. 15 m @ 120^0 from 8.5.1995 location.

Notes (14.5.1995)
In the morning found at the same location as the afternoon RT 12.5.1995. Dense 'nest' found under very dense grass. Nest made out of leaf litter and twigs. A very thick layer compared to the nest of **S2/95**. The location is within grassland. Approximate size of the nest is 30-40 cm x 20-30 cm.

Notes (16.5.1995)
In the afternoon near the top of ridge north of camp under log in amongst large sandstone boulders within 2 metres of large rainforest patch on the southern edge. Ran off into RF approx. 20 metres south of AMRT 10.5.1995.

Notes (9.5.1995)
In the afternoon found **S2**under dense hummock grass mid-way between L2T1 & L2T2.

Notes (10.5.1995)
In the morning found underneath a small mound (nest) of leaf litter and twigs. Small, flat, collapsible hole at the front. Interior appears to be self supporting. Area inside appears slightly larger than the animal. This was in a Eucalypt woodland over grassland (no rainforest adjacent) approximately 60 metres east of L2T1. Material for nest has been collected.

Notes (11.5.1995)
In the morning the animal was still in the same location as the PM recording of the previous day.
In the afternoon it was tracked under dense grass towards the bottom of a steep sided gully with numerous large boulders. Due south approximately 60 metres from L2T1. This is the gully which has a traps on the slopes and in the bottom of it at the lower end.

Notes (12.5.1995)
In the afternoon in base of the gully at the top of the gully itself south of Line 2 Trap 1. 20 m NE of yesterdays location. Huge boulders in the gully. Animal active.

Notes (13.5.1995)
Overnight trapped at Line 4 Trap 10. Released approx. 20 metres north of camp.
In the afternoon following the taking of radio bearings found that the animal was moving slowly through dense grass to the west (5-10 m) of the top of the steep sided gully.

Notes (15.5.1995)

In the morning the animal located just west of the top of the gully. Has gone underground beneath large boulders which are covered by dense grass.

Notes (17.5.1995)
The morning RT gave the location as exactly the same as RTAM 15.5.1995. Transmitter may have been displaced but couldn't be found.

Notes (13.5.1995) S3
Under very dense grass on very steep slope (with rocks) just above narrow band of rainforest which skirts the rock flat 'beach'. This very steep slope drops down to the 'beach' and mangroves. 15 metres @ 115^0 from Line 1 Trap 1. Ran quickly downslope into rainforest.

Notes (14.5.1995)
In the morning RT animal may have been close to the path on the initial reading. Indications are that it moved away.

Notes (15.5.1995)
Overnight the animal was trapped at Line 3 Trap 4 and released.

Notes (16.5.1995)
Following the second afternoon reading the animal moved away into grassland at a bearing of 143^0.

Notes (17.5.1995)
The morning gave a RT reading of 15 metres @ 15^0 from Line 1 Trap 1. The animal had been moving around the camp during the night.

Start, Tony

From: Burbidge, Andrew
Sent: Monday, 1 September 2003 14:45
To: Start, Tony; Handasyde, Tricia
Subject: FW: Golden Bandicoot work mid

FYI

Dr Andrew A Burbidge
Research Fellow
Department of Conservation and Land Management
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-----Original Message-----
From: Burbidge, Andrew
Sent: Monday, 1 September 2003 2:44 PM
To: Graham, Gordon
Subject: RE: Golden Bandicoot work mid 1990's

Thanks. I make that 15° 20' 09"S, 124° 30' 58"E.

Dr Andrew A Burbidge
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-----Original Message-----
From: Graham, Gordon
Sent: Monday, 1 September 2003 2:33 PM
To: Burbidge, Andrew
Subject: RE: Golden Bandicoot work mid 1990's

Andrew,

Yes. Along the northern side towards the eastern embayment the map shows some cliffs (unbroken). The site is at the base of that cliff (scree slope) starting at the eastern end of the bay. I suggest that, provided the island has not been burnt recently, any scree slope that has rainforest species adjacent to true savannah are likely sites to find the animals. This site was chosen because of the sheltered embayment given the 'build-up' storms that were occurring.

Gordon Graham
Policy Advisor - Nature Conservation
Ph: (08) 9442 0316
Fax: (08) 9386 2444

-----Original Message-----
From: Burbidge, Andrew
Sent: Monday, 1 September 2003 2:06 PM
To: Graham, Gordon
Subject: RE: Golden Bandicoot work mid 1990's

The one with the bullseye on the attached map?

Dr Andrew A Burbidge
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-----Original Message-----
From: Graham, Gordon
Sent: Monday, 1 September 2003 12:39 PM
To: Burbidge, Andrew
Subject: RE: Golden Bandicoot work mid 1990's

Andrew,

Still going through notes. On the west coast of Augustus approximately 2/3 of the way up from south west corner there is a small protected embayment accessed through a narrow channel. The site was adjacent to a rainforest patch on the eastern end of that embayment. The photos for Point Spring would be invaluable as they would be used in the paper I'm working on regarding the monitoring of several rainforest patches (impact of fire and cattle).

Thanks,

Gordon Graham
Policy Advisor - Nature Conservation
Ph: (08) 9442 0316
Fax: (08) 9386 2444

-----Original Message-----
From: Burbidge, Andrew
Sent: Monday, 1 September 2003 11:02 AM
To: Graham, Gordon
Subject: RE: Golden Bandicoot work mid 1990's

Thanks, Gordon

Do you have the lat long coordinates for the Augustus Island site?

I recall you were looking for old photos of Point Spring. I do have some taken before the fence was erected - would they be of any help?

Cheers, Andrew

Dr Andrew A Burbidge
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-----Original Message-----
From: Graham, Gordon
Sent: Friday, 29 August 2003 8:27 PM
To: carol palmer; Burbidge, Andrew; Start, Tony

Subject: Golden Bandicoot work mid 1990's

A number of people have been seeking information on mammal work undertaken previously in the Kimberley. I've attached some unpublished material from work undertaken in the mid 1990's.

Gordon Graham
Policy Advisor - Nature Conservation
Ph: (08) 9442 0316
Fax: (08) 9386 2444

<< File: GOLDANN.DOC >> << File: 1995 Rough notes.doc >>
<< File: GOLDFIN.DOC >> << File: ROUGH96.DOC >>