NATIONAL PARK VALUE OF GIMBAT AND GOODPARLA PASTURE LEASES

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By R. Story

RESEARCH AND SURVEY CONSULTANCY PROGRAMS
NATIONAL PARK VALUE OF GIMBAT AND GOODPARLA PASTURE LEASES

SUMMARY

The lowlands would be most useful for primary and secondary access to the park, in providing space for administrative centres, in accommodating and dispersing visitors, and as a base both for individualistic and gregarious recreation. They are scenically unattractive and their pastoral value is low.

The craggy country is scenically very attractive, and valuable in respect of pasture. Some outlying areas and some wilderness walks are briefly described. It is bewildering to travel through and dangerous, and careful screening and control of visitors would be needed. They can be expected to increase rapidly to the lowlands as well as the rugged country.

Various submissions stress that one of the most important reasons for including Gimbat and Goodparla with Kakadu national park is for protection of the South Alligator catchment.

We can obtain almost no information on the hydrology or archaeology of the two grazing leases, and their mineral potential, botany, and zoology have not been fully assessed. Nevertheless some interesting and scientifically important botanical features have so far been recorded only from Gimbat. We have erected two new land systems in Gimbat and Goodparla and might have been justified in erecting others if we had had a background of field work.

The proposed extension would be valuable in greatly enlarging the range of noteworthy features recorded from Kakadu and in protecting those that are not. Although not numerous, some of them at least do not appear to be represented outside Gimbat and Goodparla.

Many feral animals are present in Gimbat, detracting physically from its value as a national park and yet adding to its "take-over" value.
INTRODUCTION

We take it for granted that the reader will use this report in conjunction with the two published CSIRO reports on the Adelaide-Alligator and Alligator Rivers areas (Story et al. 1969 and 1976).

In cataloguing the types of country in Gimbat and Goodparla we have used mainly the 1:86 000 photography D53-1 and D53-5 of 1969, extrapolating from the land systems as given in the two CSIRO reports referred to. Our mapping and interpretation do not have the backing of field work beyond the boundaries of the Adelaide-Alligator and Alligator Rivers areas.

In evaluating the significance of the two pasture leases as part of a national park we have used the definition accepted by IUCN at its tenth general assembly in New Delhi in 1969 as quoted by Dasmann (1974) and set out in Appendix 1, together with relevant papers presented at the first and second world conferences on national parks in 1962 and 1972, published respectively in 1964 and 1974. We have, however, used them selectively according to common sense and Australian conditions, social and physical, for they express many divergent views. It is less an admission and more an unavoidable fact that our type of report will be influenced by the author's tastes however much he tries to keep in mind the tastes of others. We are writing it from that standpoint, but as far as possible with fair regard for all other points of view that we can envisage, and in particular the overriding point of view that beauty is in the eye of the beholder.
In this report "Kakadu" refers to stages 1 and 2 of the proposed park.

**LAND SYSTEMS**

**General Background**

A cyclostyled submission by the Australian National Parks and Wildlife Service (1978) to the Prime Minister and Cabinet lists the land systems in the parts of Gimbat and Goodparla dealt with in the CSIRO survey reports. The land systems in the remainder of Gimbat and Goodparla are shown in the manuscript part of the accompanying map. They include two, Elizabeth and Joan, which we consider to be new, (i.e. distinct from those already established), and which we have described from our knowledge of adjoining areas and by deduction from aerial photos and geological maps. Joan is represented by about 2.5 km$^2$ of country in the Alligator Rivers area, unit 2 of Murray land systems. All are described on the map légends, and in more detail in tabular form, the established ones in the published reports and the new ones in this (Tables 1 and 2).

Note that the land system descriptions in the two published reports are not identical. This is a reflection partly of subjectivity inherent in the survey methods, and partly of differences in the detailed character of the land systems in their occurrences across 250 km of country.

**New Mapping**

Extension of land system mapping to Gimbat and Goodparla pasture leases involved consideration of several geological formations not previously encountered. The following policies were adopted, based
on air photo pattern and the lithological descriptions from the 1:250 000 geological map -

a. Land on the Birdie Creek and Plum Tree Creek volcanic members was assumed to resemble that already defined on other volcanic rocks.

b. Areas of land on the quartzose Kurrundie Member were mapped as Buldiva land system which elsewhere in this region is restricted to the Kombolgie Formation.

c. The sedimentary Masson, Golden Dyke, and Burrell Creek Formations were mapped as the established Baker (hilly) and Bend (rolling to undulating) land systems. The lithology of these three formations (greywacke, siltstone, chert, and dolomite) may result in soils and vegetation differing from those previously described in Baker and Bend and might merit the erection of separate land systems, but no field data are available to test this possibility.

The area of Bend land system at the headwaters of the Little Mary River especially is not typical, as is easily discernible even on the 1:250 000 map from the fine-textured drainage pattern, which has no close match with the other areas of Bend, or indeed any other land system on the Mount Evelyn and Alligator River maps. The photos show the land to be closely dissected, with many small hills all very much alike and a little too high for Bend land system in which, on balance and with some hesitation, we have mapped it. The water-courses are small, linear, and on steep gradients, without a differentiated fringing vegetation, but there are several larger streams bordered by apparently, non-eucalypt woodland, probably paperbark, and widening into considerable swamps and billabongs.
Land System Potential

The hills in this atypical area of Bend land system appear generally under scrub and grassland, unattractive and monotonous, but the wetlands would be picturesque during and soon after the wet season and interesting in their plant and bird life.

Of the land systems in Gimbat and Goodparla but not in Kakadu (Ararat, Currency, Elizabeth, Explanado, Joan, Murray, Valley, and Verrucose) only Elizabeth, Joan, and Murray have some intrinsic appeal in their broken country cut into the pallic zone of deep weathering, and their *Allosyncarpia* and other non-eucalypt forests and perennial springs.

Currency is of scientific interest in its granitic soils which could be expected to support a rather specialised flora, and Ararat also, in being on extremely ancient Archaean rocks, two and a half thousand million years old.

As to grazing, Elizabeth and Joan are likely to be well watered but otherwise poor because of having soils derived from deeply weathered rocks. This is our assessment from the scanty grasses we observed on these soils in the field. The other land systems are briefly assessed by Aldrick and Story (1976). Murray is regarded as 'extremely poor', Valley as 'good wet season, fair dry season', and the rest 'good wet season, poor dry season'. We stress that this is relative grazing value; changes in management and technique and in the ability of the managers make it impossible to lay down an absolute scale, and Kirby emphasises this in a typescript report presented in 1973. The following passage, which is quoted with his permission, was written by extrapolation from his experience of similar types of country further west, and must be taken with the reserve that this implies. The reference is to that
part of the CSIRO Alligator Rivers survey area south of the Kombolgie Formation.

"This area of approximately 420 km$^2$ includes the Baker, Bend, Viney, Verrucose, Ararat, Cully, Explanado, and Murray land systems.

The soils are generally poor and there is considerable land dissection in this area. There are no adjacent plains so that both wet and dry season grazing must be carried out on these 'upland' soils. The area is one of low intensive pastoral improvement and at an estimated carrying capacity of 1:10 ha it would support no more than one pastoral enterprise."

It should be added that the author's use of the word 'plains' is restricted to alluvial plains with soils of heavy texture.

Erosion hazards for the land systems of Gimbat and Goodpara may be estimated from a tentative and qualitative summary by Williams (1976) on page 122 of the Adelaide-Alligator report, and from Table 3 in this one, which gives their areas. The results are presented in Table 4. Galloway (1976) points out that most parts of the lowlands are protected by a layer of lag gravel which guards the soil from erosion, and that its removal could lead to severe gullying. The references are on page 69 and plate 11 of the Alligator Rivers report.

For a general background to pastoral production in the Northern Territory the reader should consult the paper by Norman (1966).

GENERAL CONSIDERATIONS

Numbers of Visitors

A great deal of the proposed extension is deficient in unique or scenically attractive features, but we feel that this shortcoming is
outweighed by advantages of another nature, and vital ones at that. Two matters prompt us to say this. The first is a paragraph from a paper by Songe (1974) –

"In summer, the Yosemite Valley is full of people and cars. Crammed with campers and trailers, many campgrounds produce an urban atmosphere and are even called 'camping slums.' Long queues are formed at the dining room, and cars are incessantly on the move throughout the night. Yosemite is by no means an exceptional case, nor is the United States as a whole. As a matter of fact, this state of affairs is common in developed countries and in Japan is far worse. Of the 23 national parks, only 3 record less than 1 million visitors a year, and the numbers of visitors to such leading national parks as Fuji-Hakone-Izu (72.9 million), Seto Naikai (46.0 million), Jo-Shin-Etsu Kogen (18.8 million), Aso (17.3 million), and Nikko (16.0 million) are just astronomical. This overuse occurs because of the proximity of parks to big cities, the concentration of population in big cities, and the improved transportation system. The number of park visitors reaches its peak in autumn. In 1971, the daily number of visitors to Hakone, fairly close to Tokyo, reached 150,000, and to Nikko, 145,000, choking up these parks.

In the United States, park use concentrates on 5 percent of the total park area, and facilities are centered on that part. But in Japan, hiking and climbing in roadless wilderness areas are also very popular, and the phenomenon of overuse is widespread. In areas accessible only on foot, half a million
hikers, 70 percent of them female, swarm every year, and in
alpine regions hundreds of tents are put up, and those waiting
for their turns to climb rocks form long queues. Perhaps all
this is hardly imaginable in other countries."

In our opinion the first matter is closely related to the
second—the recent acquisition of an area of Queensland coast by a
Japanese company, for establishment of a recreational resort. It would
be extremely short-sighted to overlook the probability that this resort
will act as a safety-valve to ease conditions in the Japanese parks,
with an influx of foreign visitors that will be the thin end of a wedge,
and as nothing compared to the numbers who will eventually visit Kakadu,
particularly as the coastal resort will resemble any other while Kakadu
is unique and outstanding. Senge's last sentence should be borne in
mind.

The Low Country in Relation to Visitors.

If Kakadu is to keep its character and provide a measure of
solitude the number of visitors must be limited and dispersed, and
utilization of the less attractive lowland country is a way of doing so
pending the more direct controls that must in the long run be imposed.
Its low hills and woodland provide cover for many camp sites and admin-
istration and visitor centres 'out of sight, out of mind', and this in
turn would keep bulk sewage and garbage out of the scenic country. Its
extent would allow many points of entry through the escarpment and on to
track systems which would not need to encroach on one another. It would
cater for gregarious visitors and divert them from more inaccessible
parts which are the choice of those who prefer to be on their own. It
would provide a viewing area for the escarpment, which everywhere rises well into view above the local features, and its incorporation into Kakadu would prevent urbanisation and development up to the foot of the escarpment. Fisher landing ground (map reference Stow 4399) is a good example of the sort of place we envisage, accessible, capable of unobstructed and unobtrusive development, and giving views of the escarpment to the north-east and access by way of gorges to the tops, where there is an unusual variety of features including cliffs and valleys in fresh and metamorphosed sandstone with some immense fallen blocks, and enclosed volcanic basins. The vegetation is likewise very varied, ranging from sandstone scrub to Allosyncarpia forest. It is also within easy reach of attractive country along Fisher Creek and the South Alligator and of various mines (e.g. Coronation Hill).

The alluvial land systems referred to are number 4 to 9 inclusive in Table 5. Many will have the disadvantage from the visitor's point of view of being under shallow flooding during the wet season and inaccessible even by boat. It would be worth checking if the road between Mount Bundey and Jim Jim Waterhole is trafficable during the wet season, for if so it provides an opportunity for visitors to see this country without the constraint ofboating. The road in question goes past Black Jungle Spring (map reference Mundie 921555) and crosses Rumwaggon land system, in which numerous low gravelly risers would give the necessary viewpoints over the intervening alluvial flats.

The attractiveness or otherwise of the lowland country is set out in Table 5.
Geology and Land Forms in Relation to Visitors

Many of the mines in Gimbat and Goodparla may be rich in history, which would admittedly be local and recent, but interesting for that very reason. In respect of sight-seeing they are dealt with by the Australian National Parks and Wildlife Service (1978). To judge from the agates we found in a similar situation in stage 1 of Kakadu (Galloway 1976), visitors might find an additional attraction in fossicking in Venlaw land system 7 km south of El Sherana.

The pallid zone of deep weathering mentioned under Botanical Features in connection with the monotypic genus Allosyncarpia does not occur in Kakadu. It is of great scientific value, for its formation reflects ancient climates and thus provides clues to the history of present-day soils and land forms. The occurrences in Gimbat and Goodparla are within easy reach of Sleisbeck, and ideally situated for research. Tourists would find the white eroded gullies picturesque and different, but without a geological background would need a popular scientific talk to gain the full benefit of a visit.

The headwaters of Barramundie Creek and the west end of Waterfall Creek basin are important in their scientific and scenic interest (Galloway 1976). Up-to-date boundaries show that this part of Waterfall Creek is in stage 1, not outside it as stated in the survey report. Koolpin Creek has seven cascades, each ending in a deep and tranquil pool, the whole constituting a series of exceptional beauty. Some perfect camping spots are to be found there, but they could be quickly ruined without strict control. Stag Creek, which falls in Gimbat and is close at hand, has an area of tumbled sandstone rocks near its source which bear many paintings of very high interest and quality. The map reference is Jim
Jim 294107. The walk up and back is a demanding four-hour scramble.

An almond-shaped mass of Kombolgie sandstone rises sheer for 250 m to the west of the South Alligator River opposite El Sherana. It is about 20 km long by 10 km where it is widest, with the remains of a volcanic plug in a basin in the centre, in which Kurrundie Creek has its origin. A little north of the basin are the catchments of Motor Car Creek and Plum Tree Creek. The whole comprises an area of great contrasts and great natural charm, set in uplands of bare sandstone which give uninterrupted views of the basin and volcanic plug and end in impressive cliffs, with cascades and waterfalls. Some undulating lightly wooded country at the foot gives on to the banks of the South Alligator river. Archaeological remains have been reported from this whole area, which is to be expected in view of its attributes. It would greatly appeal to most self-sufficient campers.

This mass of rock overlooks a raised basin of similar extent to the north-west, of dissected volcanics with a cliffed sandstone border of the quartzose Kurrundie Member. Some areas of non-eucalypt forest occur, and the vegetation as a whole appears different from that of the Kombolgie sandstone.

Stereo examination and reports from those who have seen these two features indicate that besides having inclusions of rocks that do not occur in Kakadu they would in their scenery and extent be valuable assets to the proposed national park. Goodparla Homestead with its landing strip and roads is ideally situated as a base for enjoyment of this country.

As a whole, the property also has an important bearing on the impressive scenery on Barramundie Creek, for it provides access from the
Goodparla-Hudginberri road and from the vehicular track ending at Mundogie 202132. There are the makings of a spectacular and interesting wilderness trail between these two over a distance of about 30 km, leading through a gorge and waterfall on Barramundie Creek (Mundogie 184246) by way of an impending stream capture between Barramundie Creek and Waterfall Creek at Mundogie 2219, to the lower reaches of Waterfall Creek referred to and the South Alligator River. The northern road also runs close to two steep-sided enclosed basins (Mundogie 0538 and 0640) which appear from the map and photographs to present impressive scenery. An added attraction in this neighbourhood is an area of numerous billabongs along the South Alligator River.

A third prominent feature outside the main escarpment about 4 km west of Sleisbeck is a wedge of sandstone tapering at first abruptly and then very gradually to the south. It is of the same material as the Kombolgie Formation and is therefore likely to have the same vegetation. The cliffs bounding nearly all of its perimeter are up to 180 m high and most striking, but clefts shown in the photos indicate that the plateau can nevertheless be reached on foot. It would be an outstanding area for natural history, and for rock-climbing and similar energetic forms of sight-seeing, but it is not unique in any way that we can discern and its value consists in being quite separate from the main Arnhem Land massif and in thus greatly extending the range of sandstone country accessible to the public. Its area is about 50 km².

In common with the rest of the sandstone country it is craggy, with a maze of criss-cross gorges. The very factors which contribute most to the magnificent scenery are those which detract from its tourist value, for they make it extremely hazardous. We cannot over-emphasise
the ease with which one can lose the way or the serious consequences of
doing so, in this and similar country.

We have no information on its archaeology.

The remaining features that are out of the ordinary are matters
of detail, of moment only when considered together. They include

a. Patches of dense non-eucalypt trees or shrubs on some of
the volcanic rocks and on Baker land system, in otherwise
predominantly open and eucalypt vegetation. Their compos-
iton and requirements are unknown. Examples are to be
found in Stow 541985 and Mundogia 9930.

b. Bare areas of metamorphosed sandstone and attendant
volcanic rocks and non-eucalypt forest patches, e.g. Stow
820010.

c. Spectacular sandstone blocks with the likelihood of
archaeological sites, e.g. Stow 7998.

Private vs. Government Control of Gimbat and Goodparla

If the proposed extension is not incorporated, the South
Alligator River from its headwaters down to half its length will be in
private hands. There seems little danger from eutrophication in this,
both because of the small area on which improved fertilized pastures
could be grown, and because leaching would take place in the wet season
and be insignificant in terms of the volume of water. There would,
however, be attendant dangers of pollution and accelerated erosion and
denial of public access. These matters have been pointed out in various
submissions and we feel it unnecessary to labour the point, but we draw
attention to an additional advantage that would accrue from extending
Kakadu to the south - the opportunity for putting within reach of the public a world-class wilderness trail between Sleisbeck and Katherine gorge by way of the Katherine river, a distance of 100 km. In a downstream direction walkers would find it virtually foolproof, at least in respect of losing their way.

The area has not been fully prospected and there is a distinct possibility that more mineral deposits may be found, with all the complex implications to the advantage and disadvantage of the park - on the one hand access roads, buildings, airstrips, and possibly more money; and on the other hand disfiguration of the landscape, pollution, overuse, and political wrangling. Each case will have to be considered on its merits.

A professional opinion from the Bureau of Mineral Resources on the mineral development potential of Gimbaf and Goodparla is available to accredited people.

**Boundaries**

At present the boundary of Kakadu takes no cognizance whatsoever of the South Alligator catchment and cuts across scarps and valleys regardless of topography. Aldrick (personal communication) is strongly critical of "illogical, ill-informed, haphazard, and piecemeal boundaries that represent nothing more than a straight line on a map". They fragment the ecosystems and thus offer much less protection to the animals which range through them, and they complicate access, zoning, and boundary control. Support for a revision of this southern boundary is to be found in the Ranger Inquiry Second Report, page 288.
It is fairly obvious that the southern and south-western limits to Kakadu are not so much a reflection on those who set them as on the leasehold boundaries to which they were tied in the first case.

**Grazing Animals**

Available estimates from people who have studied the situation at first hand are that Gimbat has about 2000 buffaloes, 1000 cattle, 2-300 brumbies, and many pigs whose number cannot be estimated even roughly. We saw accelerated sheet and gully erosion on Explanado and Bendland systems during the CSIRO survey, and animal tracks that we assume were correlated.

In terms of park management these animals are vermin that detract from the value of Gimbat through damage to plants, soil, springs, and creeks. Although we did not encounter them there, cattle ticks are reported as "abundant", and to judge from our experience of them further north they are something to be reckoned with during the dry season, when we found the nymphs to be widespread and difficult to see because of their pinpoint size. Their bite is virulent, with effects that last for several weeks.

However undesirable these feral animals may be in a national park they are a cash asset to the lessee, and would represent an expense to the government if the lease were resumed. According to the Department of Administrative Services the Commonwealth of Australia is the landlord and could almost certainly resume the property in terms of the Lands Acquisition Act if it wished to do so, subject to paying appropriate compensation. The Australian Conservation Foundation may launch an appeal for funds to buy out the Gimbat lessee so that the property could
be handed over for inclusion in Kakadu without any pecuniary loss to the
government barring the annual rent of $1025.60 which has been paid
hitherto. According to the HCP's circular "A finance company holding a
mortgage on the property has indicated that it will sell the property
and has set an asking price of $314 000". An independent valuation from
one qualified to give it is less than half this figure, with the rider
that the station has never operated as a profitable cattle enterprise.

We have no equivalent information in respect of Goodparla.

Hydrology

We have been unable to obtain any information on the hydrology
of Gimbat and Goodparla.

The deep loose sands of Murray Land system and its extent
suggest that it would be an important aquifer, and the springs at the
eastern headwaters of the Little Mary River support this possibility.
As Murray is mainly outside the southern boundary of the two leases, we
consider it important that the areas in Gimbat and Goodparla at least
should come under government control, as constituting a source of perennial
water for the Mary and the South Alligator.

As to rainfall, the figures show a very slight drop of 225 mm
from 1522 at Munganolla beyond the northern border of Kakadu to 1297 in
Gimbat at El Sherana (McAlpine 1976), which on the face of it is negligible.
We can thus not substantiate our strong impression that these figures do
not adequately reflect the physiological dryness or wetness of the areas
in question, for in floristics and structure the vegetation in Gimbat
and Goodparla is far drier than at Munganolla.
Botanical Features

The Adelaide-Alligator and Alligator Rivers surveys of CSIRO covered 40% of the Gimbat and Goodparla, and in this 40% the survey party made the following noteworthy records of plants. The co-ordinates are from the 1:250 000 Mount Evelyn map, sheet SD 53-5, edition 1.

*Alyxia runcifolia* - new record for NT (Lazarides no. 7681, co-ordinate 596251)

*Ampelocissus* sp. nov. (L. 7829, 566324)

*Aristida hirta* - new record for NT (L. 7829, 597254)

*A. superpendens* - new record for NT (L. 7829, 597254)

*Arnhemia cryptantha* - a recently described and very distinct new genus and species endemic to Arnhem Land (L. 7870, 592287)

*Eucalyptus jacobiana* - only record from the two CSIRO survey areas (Story 8194, 599254)

*Eurybiopsis macrohiza* - first record since collection by Armstrong between 1839-49 and Mueller between 1855-6 (L. 7685, 606259)

*Fenzlia* sp. nov. (L. 7684, 599254)

*Grevillea* sp. ? nov. (L. 7820, 597254)

*Hibbertia* - several spp. nov.

*Hydriastele* sp. - rare palm (L. 7674, 587291)

*Sorghum* sp. nov. (Adams 3113, 598262)

*Utricularia* - several spp. nov.

Although most of these plants were not recorded elsewhere, this does not necessarily mean that they are restricted to Gimbat and
Goodparla; nevertheless the records, inconclusive as they are, are
certainties from exact localities and worthy of consideration if Kakadu
is to be extended. Other interesting records would without doubt result
from exploration of the remaining 60% of this area.

A further matter of botanical interest from Gimbat and Goodparla
is the presence of the monotypic genus *Allosyncarpia* on the pallid zone
of the deeply weathered Nullarbor beds. It is a tree recently described
by Blake (1977) and most unusual in its absence of close relatives and
in being found only in and around Arnhem Land on the sandstone and on
alluvium derived from it, usually in pure communities or with other non-
eucalypt trees, and surrounded by eucalypts in apparently identical
habitats. As it is plentiful within its restricted range the communities
in Gimbat and Goodparla qualify for special consideration mostly on
account of growing on the pallid zone referred to, the only such record.
They are noticeably shorter and less robust than on the sandstone, which
is to be expected, since any pallid zone material is very low in nutrients.
The occurrences are in unit 2 of Murray and in newly-constituted Joan
land system generally. *Allosyncarpia* appears to be absent from the non-
eucalypt forests on Elizabeth land system which is also on deeply weathered
rocks but of different lithology, and if this is so, these land systems
between them provide a basis for some informative work on the little-
known forest ecology of the Northern Territory as a whole.

**Visitor Preference**

Although the way visitors are catered for is a policy matter
and thus outside the scope of this report, we feel it is in order to
draw attention to the possibilities that Gimbat and Goodparla provide
for two main classes of national park holidaying - gregarious and otherwise. Most visitors are gregarious, and content to see art or scenery for its own sake, without having to exert themselves physically. This type of activity is the main one, and often the only one, permissible in most national parks of the world, e.g. the Grand Canyon and the Kruger National Park, and in the archaeological sites of Egypt and South America. It is abundantly catered for in Gimbat and Goodparla through the many excellent rock paintings that are easy to reach and police, and through the impressive cliffs and mountains visible from the lowlands.

In addition Gimbat and Goodparla can offer enormous opportunities to the minority who prefer to see the attractions of the park in their natural context rather than on exhibition, and who will put up with some hardship for the sake of doing so. The paintings at Stag Creek are an example, and a great number of other possibilities exist that would entail self-sufficient walking for a week or longer. We do not wish to imply that such areas do not exist further north in Kakadu as well. They do. But they are so easily destroyed by overuse and overall so sought after, especially in other parts of the world from which our future visitors will inevitably come, that we feel it would be a great and irrevocable mistake to lose the chance of acquiring those based on Gimbat and Goodparla.

Archaeology

In a typescript report dated 1976 Chaloupka has given the co-ordinates for a number of archaeological sites on the Jim Jim map, but there appears to be little specific information on those
in Gimbat and Goodparla. We know from our Alligator Rivers survey that paintings are to be found in practically every rock shelter in Buldiva land system and could be numbered probably by the thousand. It is very unlikely that the newly mapped areas of Buldiva would be any exception.
ACKNOWLEDGEMENTS

My colleague Dr. R.W. Galloway has been a 'cheerful giver' of his time, knowledge, and experience in extending the land system mapping and in informed criticism of the report, something which Dr. Graham Yapp has also given me. Messrs John Aldrick and George Chaloupka have been most informative in giving me details from their private and official visits to the area. The staff of the Australian National Parks and Wildlife Service have put their photos, maps, and information at my disposal, and I have had the benefit of discussions with Mr. Douglas Hill of the Australian Conservation Foundation and access to the Foundation's files. I have made use of Dr. R.J. Millington's generous facilities in the Division of Land Use Research, CSIRO, and have freely exploited the kindness of his mapping, typing, editorial and technical staff. I offer my thanks to all these people. With so much outside information given to me I have written the report in the first person plural, while still accepting full responsibility for it.

Robert Story

January 1979
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Department of National Development Bureau of Mineral Resources (undated). Professional opinion GEOL/H/78.027.


Definition of a National Park Accepted by IUCN at its General Assembly in New Delhi, 1969, as quoted by Hasemann (1974)

A national park has the following characteristics: It is a relatively large area (1) where one or several ecosystems are not materially altered by human exploitation and occupation; (2) where plant and animal species, geomorphological sites, and habitats are of special scientific, educational, and recreative interest, or which contains a natural landscape of great beauty; (3) where the highest competent authority of the country has taken steps to prevent or eliminate as soon as possible exploitation or occupation in the whole area and to enforce effectively the respect of ecological, geomorphological, or esthetic features which have led to its establishment; and (4) where visitors are allowed to enter, under special conditions, for inspirational, educative, cultural, and recreative purposes.

Further restrictions imposed by the London Convention of 1933, the Washington Convention of 1940, and the African Convention of 1968 specifically rule out the "hunting, killing, or capturing of fauna" and "destruction or collection of flora" except under "direction and control of park authorities." Exploitation of the park's resources for commercial profit is forbidden.
IUCN has further suggested restrictions calling for (1) a statutory basis giving sufficiently strict protection; (2) a certain minimum size; and (3) adequate staffing and an adequate budget for maintenance and protection.

The concept of a national park which emerges from these requirements and restrictions is sufficiently exclusive that a high percentage of the world's natural reserves actually included in the U.N. list would not be included if these criteria were strictly applied. This does not mean that the criteria should be abandoned, but rather that they should be carefully examined to see whether or not they contribute toward the purposes for which a national park or reserve is established.
TABLE 1

(E1) ELIZABETH LAND SYSTEM (65 km²)

Dissected hills and rolling terrain on weathered siltstone and greywacke; mixed scrub, some non-eucalypt forest

<table>
<thead>
<tr>
<th>Unit</th>
<th>Area and Distribution</th>
<th>Geomorphology</th>
<th>Vegetation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>60% Throughout</td>
<td>Ridges</td>
<td>Mixed scrub and mixed woodland</td>
</tr>
<tr>
<td>2</td>
<td>40% Throughout</td>
<td>Valleys</td>
<td>Non-eucalypt forest</td>
</tr>
</tbody>
</table>
TABLE 2

(Jo) JOAN LAND SYSTEM (90 KM²)

Scarps, rolling and hilly terrain cut in Kombolgie Formation and weathered siltstone; areas of residual and alluvial sand; *Allosyncarpia* forest, some woodland, probably non-eucalypt

<table>
<thead>
<tr>
<th>Unit</th>
<th>Area and Distribution</th>
<th>Geomorphology</th>
<th>Vegetation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>45% Throughout</td>
<td>Rolling terrain</td>
<td>Mixed scrub and mixed woodland</td>
</tr>
<tr>
<td>2</td>
<td>30% Throughout</td>
<td>Rolling terrain</td>
<td><em>Allosyncarpia</em> forest</td>
</tr>
<tr>
<td>3</td>
<td>20% Margins</td>
<td>Steep cliffs and breakaways</td>
<td>Mixed scrub or <em>Allosyncarpia</em> forest</td>
</tr>
<tr>
<td>4</td>
<td>5% Throughout</td>
<td>Alluvium</td>
<td>Mixed scrub or <em>Allosyncarpia</em> forest</td>
</tr>
</tbody>
</table>
TABLE 3

Areas of land systems in Gimbat and Goodparla

<table>
<thead>
<tr>
<th>Land System</th>
<th>Area (km²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amhurst</td>
<td>5</td>
</tr>
<tr>
<td>Ararat</td>
<td>80</td>
</tr>
<tr>
<td>Baker</td>
<td>565</td>
</tr>
<tr>
<td>Bedford</td>
<td>40</td>
</tr>
<tr>
<td>Bend</td>
<td>960</td>
</tr>
<tr>
<td>Buldiva</td>
<td>1710</td>
</tr>
<tr>
<td>Bundah</td>
<td>85</td>
</tr>
<tr>
<td>Cully</td>
<td>415</td>
</tr>
<tr>
<td>Currency CR</td>
<td>180</td>
</tr>
<tr>
<td>Effington</td>
<td>15</td>
</tr>
<tr>
<td>Elizabeth</td>
<td>65</td>
</tr>
<tr>
<td>Explanado</td>
<td>280</td>
</tr>
<tr>
<td>Fabian</td>
<td>80</td>
</tr>
<tr>
<td>Flatwood</td>
<td>215</td>
</tr>
<tr>
<td>Honeycomb</td>
<td>20</td>
</tr>
<tr>
<td>Joan</td>
<td>90</td>
</tr>
<tr>
<td>Kay</td>
<td>45</td>
</tr>
<tr>
<td>Keating</td>
<td>15</td>
</tr>
<tr>
<td>Keefer's Hut</td>
<td>75</td>
</tr>
<tr>
<td>Klatt</td>
<td>260</td>
</tr>
<tr>
<td>Knifeshandle</td>
<td>15</td>
</tr>
<tr>
<td>Kysto</td>
<td>95</td>
</tr>
<tr>
<td>Levee</td>
<td>40</td>
</tr>
<tr>
<td>McKinlay</td>
<td>80</td>
</tr>
<tr>
<td>Murray</td>
<td>270</td>
</tr>
<tr>
<td>Queue</td>
<td>260</td>
</tr>
<tr>
<td>Rumwaggon</td>
<td>65</td>
</tr>
<tr>
<td>Somerville</td>
<td>105</td>
</tr>
<tr>
<td>Valley</td>
<td>15</td>
</tr>
<tr>
<td>Venlaw</td>
<td>25</td>
</tr>
<tr>
<td>Verity</td>
<td>30</td>
</tr>
<tr>
<td>Verrucose</td>
<td>70</td>
</tr>
<tr>
<td>Viney</td>
<td>755</td>
</tr>
</tbody>
</table>

Total: 7025
TABLE 4  
LAND SYSTEMS AND EROSION IN GIMBAT AND GOODP'ARLA

<table>
<thead>
<tr>
<th>Erosion Hazards</th>
<th>Land Systems</th>
<th>Percent Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>Honeycomb</td>
<td>negligible</td>
</tr>
<tr>
<td>A2</td>
<td>Buldiva, Currency, Kay, Kysto,</td>
<td>30</td>
</tr>
<tr>
<td>A3</td>
<td>Verrucose</td>
<td>negligible</td>
</tr>
<tr>
<td>A2B1</td>
<td>Ararat, Bedford, Bend, Bundah, Flatwood, Levee Queue, Valley, Venlaw</td>
<td>25</td>
</tr>
<tr>
<td>A2B2</td>
<td>Effington, Fabian, Murray, Rumwaggon, Verity, Viney</td>
<td>15</td>
</tr>
<tr>
<td>A2B3</td>
<td>Explanado</td>
<td>5</td>
</tr>
<tr>
<td>A3B1</td>
<td>Baker, Cully, Jay, Knifehandle</td>
<td>15</td>
</tr>
<tr>
<td>A3B3</td>
<td>McKinlay, Somerville</td>
<td>5</td>
</tr>
<tr>
<td>A2B1C2</td>
<td>Amhurst</td>
<td>negligible</td>
</tr>
<tr>
<td>Not evaluated</td>
<td>Elizabeth, Joan</td>
<td>5</td>
</tr>
</tbody>
</table>

*A - sheet erosion, B - gully erosion, C - mass movement, 1 - minor, 2 - moderate, 3 - severe*
# TABLE 5

**SCENIC OR NATURAL HISTORY VALUE OF LOWLAND LAND SYSTEMS IN GIMBAT AND GOODPARLA**

<table>
<thead>
<tr>
<th>General</th>
<th>Wet Season</th>
<th>Dry Season</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bend</td>
<td>Ephemeral creeks, otherwise as for General</td>
<td>A for General</td>
</tr>
<tr>
<td>Cully</td>
<td>Ephemeral creeks, otherwise as for General</td>
<td>A for General</td>
</tr>
<tr>
<td>Currency</td>
<td>Extensive flooding</td>
<td>Pools and billabongs</td>
</tr>
<tr>
<td>Effington</td>
<td></td>
<td>Arid aspect, occasional pools</td>
</tr>
<tr>
<td>Kinchyle</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Livue</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillin</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flatwood</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rumbeaggon</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Queue</td>
<td>As for General</td>
<td>A for General</td>
</tr>
<tr>
<td>Murray</td>
<td>As for General</td>
<td>As for General</td>
</tr>
<tr>
<td>Knifchandle</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kysto</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Valley</td>
<td>Lush and varied ground vegetation, ephemeral creeks</td>
<td>Very arid aspect; waterless, unvarying, featureless, dull</td>
</tr>
<tr>
<td>Verrucosa</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vinsky</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ararat</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Explanado</td>
<td></td>
<td></td>
</tr>
<tr>
<td>} Eucalypt woodland, low stony hills</td>
<td>As for General</td>
<td></td>
</tr>
<tr>
<td>} Mixed woodland, level, poorly watered</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>