Bungle Bungle Working Group

Final Report to the
Environmental Protection Authority

Department of Conservation and Environment
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PREFACE

This work represents the Bungle Bungle Working Group's final report to the Environment Protection Authority. It follows the release, in October 1984, of the Working Group's "Draft Report to the Environmental Protection Authority" for a period of public comment.

The draft report attracted a total of 49 submissions from individuals, various groups and organisations, private industry and State and Commonwealth Government Departments. While the majority of submissions originated from metropolitan Perth, submissions were received from throughout Western Australia and from people in New South Wales, Victoria, Tasmania, the A.C.T. and the Northern Territory.

The comments made in the submissions were compiled and collated by the Department of Conservation and Environment. This information was considered by the Working Group and formed the basis for its review of the draft report, which led to the preparation of this revised report, the Working Group's final report to the EPA. The review of public submissions is available as a separate DCE Bulletin. (No. 260).

This final report has been endorsed by the Environmental Protection Authority and was forwarded to the Hon. Minister for the Environment, in October 1985 for consideration by Government.

Summary of Report and Recommendations

Reservation as National Park

The Working Group considered a Study Area comprising the Bungle Bungle massif and surrounding lands, a total of some 350,000 ha comprising the north-west portion of the Ord River Regeneration Reserve, together with the adjoining Osmond Valley pastoral lease and the mountainous southern portion of Texas Downs pastoral lease.

Based on its assessment of the Study Area's natural resources, past and present landuses and Aboriginal associations with the area, the Working Group recognised five key issues which it considered in determining the future landuse and management options for the area. They are:

— Conservation (of biotic and landscape resources);
— Aboriginal interests (cultural, social and economic);
— Tourism;
— Mineral exploration; and
— Soil and vegetation rehabilitation requirements.

The area encompasses a variety of land systems ranging from complex folded and faulted uplands, of basaltic, limestone, siltstone and doloritic rock, to the sandstone structural plateaux of Bungle Bungle and surrounding sand plains together with outwash frontage slopes and alluvial flats along the Ord and Panton Rivers.

The Working Group recognises in this area elements of outstanding scenic attraction and a combination of land surfaces and vegetation, much of which is not well represented or reserved at all in the existing or currently proposed system of conservation reserves in the Kimberley region. Included in the area are tropical grasslands and savannah ecosystems, representative of ecosystem groups recognised in the World Conservation Strategy as being poorly represented in protected areas world-wide and in need of further reservation.

The Working Group considers that the purpose of national park best caters for the combined needs of conservation and tourism and soil and vegetation rehabilitation requirements. It notes potential advantages of joint management with Aboriginal traditional owners who have demonstrated deep ongoing ties to their traditional lands and an extensive, detailed knowledge of the flora, fauna and ecology of the area.

Irrespective of the adoption of national park status over this land, under present Government legislation and policy,mineral exploration may continue. National park status will, however, facilitate the application of conditions to minimise the impact of exploration.

The Working Group, however, believes there is a strong case for excluding the Bungle Bungle massif and its immediate surrounds from mineral exploration other than broad area mapping from remote platforms. It is the spectacular core of the subject area and is considered to be of low mineral prospectivity.

The small Osmond Valley pastoral lease, adjacent parts of the Mabel Downs pastoral lease and the southern upland areas of Texas Downs pastoral lease, would add substantially to the representation within the park of the flora, fauna and landscapes associated with the diverse substrates and moisture regime prevailing in the Osmond Ranges, and complement the generally drier environments of the sand plain and Bungle Bungle range. These ranges are also understood to contain sites of significance to Aboriginal traditional owners.

Recommendation 1 — National Park Reservation, Reserve Boundaries and Mineral Exploration

The Working Group recommends that:

1.1 the north-western portion of the Ord River Regeneration Reserve including the Bungle Bungle massif should be proclaimed a national park;

1.2 the park should extend to an interim boundary along the eastern/southern bank of the Ord and Panton Rivers and the unnamed tributary of the Panton River (as shown in Map 8), to a point 1 km east of the western boundary of the regeneration reserve, then due south to the southern bank of the Panton River and west along the southern bank of the Panton River to the boundary of the Ord River Regeneration Reserve;

1.3 at the earliest opportunity discussions should be held with adjoining pastoral leaseholders with the aim of including within the national park the Osmond Valley Pastoral lease; adjacent upland portions of Mable Downs pastoral lease, including the remainder of the Osmond Valley, Mount Parker and the Winamma Gorge and Spring area; southern upland portions of Texas Downs pastoral lease; and a small area of Sophie Downs pastoral lease adjacent to the extreme south-west of the proposed national park, which would complete the inclusion within the national park of a feature of major Aboriginal mythological significance;

1.4 a biological survey be undertaken to determine the merit of including the remainder of the Osmond Range, and associated uplands to the west of the Ord River Regeneration Reserve extending as far south as the Ord River, within the national park;

1.5 the implementation of the above proposals, which apply to mainly rugged areas of little pastoral value, should involve a process of consultation with the pastoral leaseholders, aimed at determining appropriate manageable boundaries;

1.6 once fence lines south and east of the Ord and Panton Rivers within the regeneration reserve have been relocated on more manageable alignments by the Department of Agriculture, in liaison with the Department of Conservation and Land Management, the national park boundaries should be extended to the fence lines;

1.7 the future status of the MacIntosh Plains area, adjacent to the proposed south-western extension of the proposed national park and bounded by the Panton River in the east (see Map 8), should be determined in discussions between the Departments of Agriculture and Conservation and Land Management once the regeneration programme has stabilised the area;

1.8 in view of its high conservation values and low mineral potential, the Bungle Bungle massif and its immediate surrounds be excluded from any future mineral exploration other than broad area mapping from remote platforms (aircraft or satellites).

Tenure

The Working Group recognises the Aboriginal traditional owners' strong ties to the subject area and their desire to return to their traditional lands for spiritual, social and economic reasons. It also recognises that this area is an important part of the heritage of Western Australia and indeed Australia.

Security of tenure and purpose is essential for a national park if it is to perform its function in perpetuity as intended. Equally essential is security of the traditional owners' right to reside and participate in the management of their traditional lands.

In recognition of the value of the area as an important part of the heritage of all West Australians the Working Group favours the vesting of the area in the National Parks and Nature Conservation Authority as an A Class reserve for national Park. Recognition of the special relationship of the Aboriginal traditional owners to their land and their right to secure residence on and an equitable role in the management of their traditional lands must be provided for. The Working Group considers that the vesting of the area in the National Parks and Nature Conservation Authority should be subject to conditions providing secure residence and equitable input to management for Aboriginal traditional owners. An A Class reserve, which requires the approval of both Houses of Parliament before any amendments can be made to the vesting conditions, is necessary to provide an adequate level of security under this mechanism.

At present there is no legislative basis in Western Australia which will provide for the necessary security required by both parties to a joint-management national park. The Working Group's terms of reference do not allow a consideration of the legislative changes necessary to facilitate its proposals.

The Working Group acknowledges that the people recognised by the Aboriginal community as traditional owners of this area have indicated their preference for freehold title to the area, in conjunction with a negotiated establishment of a jointly managed national park.

Recommendation 2 — Tenure

The Working Group recommends that:

2.1 the proposed national park be vested in the National Parks and Nature Conservation Authority as an A Class reserve; and

2.2 the vesting be subject to mechanisms providing secure residence and equitable input to management for Aboriginal traditional owners. Such mechanisms are not available under existing legislation and their consideration is beyond the terms of reference of the Working Group.

Joint Management

The Working Group believes that the Aboriginal traditional owners would make a valuable contribution to the management and interpretation of the national park, through their extensive and detailed knowledge of plant resources and ecological relationships in the area and the interpretation of Aboriginal culture and mythology.

Experience with Kakadu and Gurig National Parks, the established jointly managed national parks in the Northern Territory, has shown that national parks jointly managed with Aboriginal traditional owners can work in a functional manner for both interests.

The concept is well accepted by the Aboriginal traditional owners who are typically interested in the management of their traditional land and is also recognised and accepted by the people in the national park agencies (ANAWS, CCNT) and the Northern Land Council and Department of Aboriginal Affairs with whom members of the Working Group spoke.

Formal mechanisms are needed to provide a guarantee of equitable input to management decision-making. This is important if the traditional owners are to remain satisfied with the system in the long term. The mechanisms should aim to be compatible with traditional Aboriginal approaches to decision-making, by facilitating discussion of issues amongst traditional owners before decisions are made.

Recommendation 3 — Joint Management Mechanisms

The Working Group recommends that:

3.1 the proposed national park be jointly managed by the Department of Conservation and Land Management and the Aboriginal traditional owners;

3.2 a Board of Management be established with representatives from the national parks agency and an incorporated body representing the traditional owners to guarantee equitable input to management decision-making for both parties. The Board should be the primary decision-making authority with respect to management of the reserve. There are considered to be advantages in a co-operative and collaborative decision-making process based on consensus agreement;

3.3 the Board should function as a reviewing and ratifying body, considering recommendations on major issues, including policy, planning and budget issues developed by it or referred to it by the Department of Conservation and Land Management, the Aboriginal incorporated organisation and other individuals or bodies;

3.4 members of the Board should have access to independent advice;

3.5 there be some recourse to technically competent, independent and mutually acceptable adjudication should agreement not be possible within the Board;

3.6 decisions which would affect the status of sites of significance to Aboriginals should be subject to agreement by the Aboriginal incorporated organisation; and

3.7 the Department of Conservation and Land Management prepare, at the earliest opportunity and in liaison with the Board of Management, a draft plan of management for public comment. The final plan of management is to be made public following its endorsement by the Board.

Regeneration of Degraded Areas

The Study Area lies for the most part within the Ord River Regeneration Reserve which was proclaimed in 1967 to facilitate the stabilisation and regeneration of eroded areas in the Ord River catchment and so mitigate siltation of Lake Argyle.

Within the Study Area, degraded lands are confined to the more productive pasture lands along the major drainage lines, notably the Ord River.

These areas supported tropical grasslands and vegetation communities representative of ecosystem groups regarded as a high priority for further reservation on a world-wide scale by the World Conservation Strategy.

Furthermore, they offer the only opportunity to include river-frontage slopes and alluvial surfaces representative of the major Kimberley sedimentary basins in the conservation reserve system, short of purchasing a pastoral lease.

In view of the high intrinsic conservation value of these lands the Working Group favours their inclusion in the proposed national park despite some areas being in a degraded state at present. It recognises the Department of Agriculture's concern that the Department of Conservation and Land Management may not be able to adequately fund a regeneration programme. Funding for the Department of Agriculture's ongoing regeneration work in this area comes out of consolidated revenue, as do funds for park management. The Working Group believes that in the context of this area being included in a national park, funding for regeneration work could be directed towards either agency, that is, it need not be directed to the Department of Conservation and Land Management provided it is utilised for the purposes of rehabilitation to indigenous vegetation. There are considerable advantages perceived in continuing to utilise the equipment and the expertise within the Rangelands Management Branch of the Department of Agriculture in any regeneration programme.

Recommendation 4 — Regeneration

The Working Group recommends that:

4.1 the Department of Conservation and Land Management initiates administrative arrangements with the Department of Agriculture to ensure the allocation of funds and co-ordination of the ongoing regeneration programme, including the management and removal of cattle, to restore degraded lands within the proposed national park to indigenous vegetation utilising the expertise built up by the Rangeland Management Section of the Department of Agriculture; and

4.2 the Department of Conservation and Land Management advises the Board of Management of the proposed National Park with respect to this programme.

Employment Opportunities and Training

Aboriginal traditional owners are seeking to return to their traditional lands for spiritual and cultural reasons. However, quite apart from these reasons, they wish to escape the severe social and economic conditions associated with life in large non-traditional communities and fringe settlements.

The opportunity to return to reside with security on their traditional lands and the renewed strengthening of spiritual and cultural ties that this would facilitate, will be important in building the self-esteem and confidence of the traditional owners. However, increased employment opportunities, and the reduced dependency of the community on social welfare that results, will also play a crucial role in their quest for a more meaningful life.

In the context of a national park on Aboriginal traditional lands, for which the traditional owners have a deep and ongoing attachment, it is considered appropriate that the traditional owners should be given opportunities for employment.

In the context of the national park proposed in this Report, it is likely that relatively few employment opportunities for traditional owners would be available in the normal ranger stream, at least in the next few years. It is envisaged, however, that considerable potential exists for the employment of traditional owners in an interpretative role and in contract employment related to specific management, regeneration or development projects in the national park. The Working Group also believes that the traditional owners should have the first option on any proposed tourist operations within the national park on a leasehold or concessionaire basis. Training programmes are needed to train traditional owners to fill ranger and other positions within the proposed national park. The aims, content and format of these programmes need considerable thought and should be developed to cater specifically for the needs of the position and include a significant on-the-job component.

It is not appropriate that the Working Group make specific recommendations on the form that Aboriginal training should take. It is understood that the Department of Conservation and Land Management recognises the need for Aboriginal ranger training programmes and is in the process of formulating such programmes.

Recommendation 5 — Employment and Training

The Working Group recommends that:

5.1 the Department of Conservation and Land Management should aim to employ a balance of Aboriginals and non-Aboriginals in the proposed national park. Employment should aim to utilise the Aborigines' traditional skills and cultural knowledge for the benefit of park interpretation and management;

5.2 employment opportunities for Aboriginals should not be restricted to normal ranger positions, nor to permanent full-time employment. The possibility of contract employment for specific projects should be considered;

5.3 both Aboriginal and non-Aboriginal employees should be subject to the same dismissal clauses; and

5.4 in developing Aboriginal training programmes, close liaison should be maintained with

those responsible for developing the training programmes in other States, and especially in the Northern Territory. The structure and content of training programmes should be closely linked to and reflect the requirements of the position.

Aboriginal Outstation and Welfare Issues

Experience at Gurig and Kakadu National Parks has clearly shown the importance of Aboriginal traditional owners forming a legally incorporated body. Such a step is a normal requirement before these groups can become eligible for Federal and State funding under various schemes and is of course necessary if the group wishes to control its own finances or take out loans for development.

The Working Group believes that it is not appropriate for the Department of Conservation and Land Management to accept primary responsibility for Aboriginal Outstation development and welfare. Rather it supports the development of self-management with assistance from Aboriginal resource organisations and relevant State and Federal Government agencies as necessary. It is recognised , however, that the Department has some responsibility, as the managing agency, for ensuring that adequate funds are available to facilitate effective Aboriginal participation in joint management, and responsibility in planning the location and development of outstations to ensure they are compatible with park planning proposals and management objectives.

Recommendation 6 — Aboriginal Outstation and Welfare Issues

The Working Group recommends that:

6.1 the Aboriginal traditional owners form a legally incorporated body should the proposed joint-management national park proceed. The Working Group recognises the role of Aboriginal resource organisations and various Federal and State agencies in assisting in the establishment of Aboriginal outstations. It believes that this is not a role that should properly be adopted by the Department of Conservation and Land Management. However the Department needs to ensure that the Aboriginal incorporated organisation is adequately funded to fulfil its role on the Board of Management.

Tourism Development Concepts

The remoteness of the Bungle Bungle massif, the nature of the terrain involved and climatic considerations impose constraints on tourist development in the proposed national park.

Vehicle access at present is only possible via two rough tracks from the west and north-west respectively. The Main Roads Department estimate the costs of upgrading the tracks to a formed gravel road, suitable for conventional tourist vehicles, at some $25,000/km. At that rate upgrading either one of the tracks is likely to cost in the order of $1,000,000. Vehicle access could still be cut for 3-4 months of the year and the road would require an expensive maintenance programme following each wet season.

Scenic flights over the Bungle Bungle massif are increasingly popular. Flying offers a spectacular perspective not possible from the ground, enabling visitors to gain a better appreciation of the features, variety and scale of the Bungle Bungle massif. It also offers a means of seeing the area year-round.

Access from the ground provides visitors with a close-up view of the range, it enables detailed appreciation of its features, texture, flora and fauna and its scale from a human perspective. Importantly, it also facilitates interpretation of elements of traditional Aboriginal culture and lifestyle, opening up a new dimension to the park as a tourism and recreational resource.

The provision of aircraft landing facilities within the proposed national park, in conjunction with transport within it, offers an interesting and cost-effective alternative to major upgrading of road access. Significantly, it would facilitate year-round access, offering the potential to boost summer "Green Season" tourism in the region.

The rapid access made possible from nearby centres such as Kununurra, Halls Creek and Turkey Creek as a result of the air-surface option makes it very attractive, particularly in the initial years, to avoid the major costs and inevitable environmental disruption associated with the development of accommodation facilities and associated infrastructure in the proposed national park.

Accommodation requirements could be met by private enterprise within the existing regional centres such as Kununurra and Halls Creek. The cost of establishing and servicing accommodation facilities in the national park, given the complete absence of any services and the remote location, would be very high and in many ways counter productive.

It is in part the remoteness and intrinsic wilderness values of Bungle Bungle that have captured the public imagination. Upgraded road access would to a degree diminish these values.

In developing its recommendations for tourist development, the Working Group has recognised that tourists will be seeking a range of experiences tailored to fit their budget, time constraints and expectations. In this context, the Working Group proposed the following development concepts for the short to medium term.

Recommendation 7 — Tourism Development Concepts

The Working Group recommends that:

7.1 scenic over-flights of the proposed national park be regarded as an appropriate tour option for tourists on an organised tour and those otherwise constrained by time considerations. Various cost options, based on flight duration, for example from Halls Creek, Turkey Creek or Kununurra, would be possible;

7.2 an air-surface tourist option should be facilitated by the construction of a landing ground on a suitable site in the park where it would not compromise the scenic, conservation or Aboriginal values, and the provision of vehicle access to and from the landing ground to various scenic landscapes in the proposed national park;

7.3 an access track be upgraded to enable the supply of resources to the proposed national park and to facilitate vehicle access during the dry season for the suitably equipped tourist. The provision of upgraded road access to a standard suitable for caravan or coach based tourists would be prohibitively expensive and is not considered feasible in the short to medium term at least;

7.4 discrete, low-key camping facilities be provided at a suitable location or locations near the periphery of the park. It is envisaged that these facilities would primarily cater for vehicle-based visitors, but they could also cater for self-contained air-surface tourists and, with the availability of camping equipment for hire, a wider selection of flying tourists proposing to stay more than one day;

7.5 subject to full investigation and analysis of park resources, detailed consideration could be given to the construction of a higher standard of facilities in detailed management plans to be prepared by the Department of Conservation and Land Management in conjunction with the Board of Management;

7.6 access for private vehicles could be provided to a few scenic locations and interpretation facilities. Sightseeing beyond these areas should be by guided or self-guide walking tracks, with the option of an agency or concessionaire vehicle-based guided tour to more remote areas; and

7.7 the first option for the development of tourist facilities within the national park on a leasehold or concessionaire basis should be available to the traditional owners.

Interim Management

It is desirable that access to the area should continue to be discouraged until the long term

future of the area has been resolved and a true management capability established.

However, in the event that a jointly managed national park cannot be proclaimed for the 1985 tourist season, it is recognised that it will be necessary to facilitate management of the area and direct visitors towards the most appropriate areas without compromising park values, future management options or the needs of the Aboriginal traditional owners.

Recommendation 8 — Interim Management

The Working Group recommends that:

8.1 as an interim measure the Study Area should be declared a C Class reserve for National Park at the earliest opportunity, so that a management presence can be established in the area and national park regulations applied over it;

8.2 a minimum of two management staff be established in the national park as soon as possible after the declaration of national park status;

8.3 work should be carried out to determine the appropriate location of access tracks and camping areas and to discourage access to inappropriate areas. Traditional owners should be involved in this process; and

8.4 ground access should not be improved until the future of the area is secure and a permanent management presence is established; however some interim management measures will be necessary to direct tourists to the most appropriate areas and so minimise damage resulting from vehicle-based access. This action should occur even before national park status is granted.

Funding Requirements

The combination of remoteness, difficult access, substantial tourism interest, a fragile environment, rehabilitation requirements, and costs associated with joint management will make this an expensive park to establish. It is estimated that capital costs for access and development in the first year of national park status will be about $675,000–725,000 based on the following breakdown:

$400,000 — to establish two management staff and families and associated infrastructure (housing, power, water, communication, vehicles, etc.)

$ 60,000 — temporary accommodation for visiting staff

$ 65,000 — for a biological survey of the Bungle Bungle area and proposed additions to the park

$100,000 — to establish and maintain basic access and management tracks and facilities

$ 50,000–100,000 — contingency for the development of an aircraft landing field.

These costs do not include those associated with the regeneration programme. However, the proposed national park should not add significantly to the ongoing funding requirements of this programme. Costs associated with the establishment of Aboriginal outstation/s should be largely outside the budget of the Department of Conservation and Land Management. While the costs of supplying services to outstations will be more expensive than to large central communities, the benefits of reduced dependence on welfare and improved social and cultural life and health are expected to offset this.

The provision of adequate funding and staff resources will be critical to the successful running of the proposed national park, more so even than in the case of a typical single-management national park. It should be recognised that, unlike the typical national park, a joint- management national park includes a community as an integral part of the reserve. To a significant degree the well-being of the community will be dependent on adequate resources being made available for management.

It is estimated that initially a minimum of two permanent management staff will be required, with provision for additional park maintenance staff required subsequently. When the area is established as a jointly managed national park there will be a requirement for professional management staff (one initially) to be based on site. This position is critical to the success of the proposals; it requires a person with sensitivity and skill in the issues involved in joint management of a national park and of sufficient standing in the Department to be empowered to make complex decisions. Professional regional staff and support facilities will also be necessary. The selection of appropriate staff is one of the critical factors in determining the success of a joint-management national park.

Funding for the proposed national park should be additional to the existing funding for national park management in Western Australia.

Recommendation 9 — Funding Requirements

The Working Group recommends that:

9.1 adequate funding be made available to establish, develop and manage the proposed national park. Adequate funding is critical to the success of the proposed park and it is suggested that, if such funds are unlikely to be available, then other alternatives to the recommendations made in this Report may need to be considered. It is estimated that approximately $675,000–725,000 would be required for operations and capital improvements in the first year.

9.2 The provision of adequate funds from Aboriginal resource agencies and State and Federal Government agencies, to establish Aboriginal outstation facilities, an Aboriginal incorporated organization and Aboriginal participation in joint management, should be considered a priority.

Footnote: See Appendix III — Protection of Bungle Bungle — Recommendation from Report from the House of Representatives Standing Committee on Environment and Conservation, March 1985.

1 THE WORKING GROUP

1.1 Formation

Widespread media promotion in late 1982 and early 1983 of spectacular landforms in a previously unpublicised area referred to as Bungle Bungle generated considerable public interest in the area. Much of the ensuing publicity inferred that the area either was or should be a national park.

Responding to public interest and the clearly unusual and arresting nature of the landscape at Bungle Bungle, the then National Parks Authority at its meeting of 16 February 1983 resolved to write to the Environmental Protection Authority asking it to consider establishing a Working Group to investigate the Bungle Bungle area and adjoining lands.

At its meeting of 28 February 1983 the EPA agreed to this request and asked the Department of Conservation and Environment to convene an informal interdepartmental Working Group.

1.2 Terms of Reference

The terms of reference of the Working Group, when initially proposed by the EPA, were:

"To investigate and report on the status, vesting and purpose of Bungle Bungle and adjoining land".

"Bungle Bungle" was not defined, though it is understood that the National Parks Authority, in asking the EPA to consider establishing the Working Group, were referring to the Ord River Regeneration Reserve (No. 28538) or a substantial part of it. At the time the Bungle Bungle massif* which was the subject of all the media interest, was unnamed. Strictly speaking, Bungle Bungle was the name of an abandoned outstation north-west of the massif and had been used as a geographically convenient reference to the area.

After an initial on-site investigation of the area in June 1983, the Working Group defined its core area of interest as the north-western portion of the Ord River Regeneration Reserve (No. 28538), roughly delineated in the south and east by the Ord and Panton Rivers and a unnamed tributary of the Panton. However, it recognised that the existing cadastral boundaries were essentially arbitrary in location and that some adjacent areas should also be considered. After further analysis, the Working Group became of the view that the Study Area should also include the Osmond Valley pastoral lease, the adjacent southern portion of Texas Downs pastoral lease and extend to include the full length of the Panton River within the Regeneration Reserve (See Map 1).

With increasing knowledge of the Study Area and the key issues involved, there was an obvious need for the terms of reference to be expanded to facilitate a consideration of management requirements. This was particularly important considering the high demand for, and attempts at, tourist access to the area, the difficulty of such access and relatively fragile nature of the land involved. It was also necessary, in view of the pronounced Aboriginal interest in the area, to permit a consideration of joint management options.

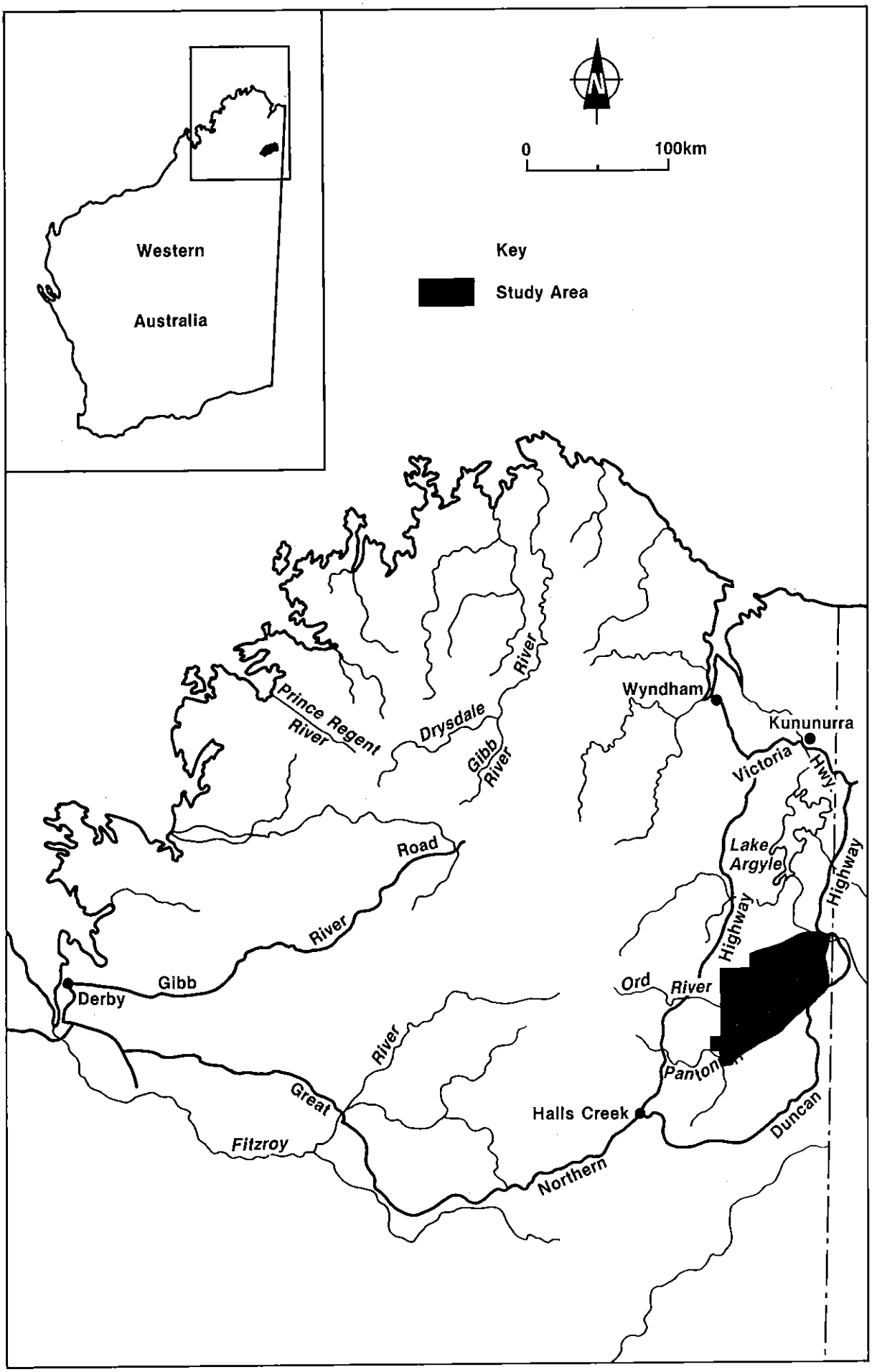
Having recognised the Aboriginal interest in the area, the Working Group was in the difficult position of running concurrently with the Aboriginal Land Inquiry and thus operating in something of a vacuum in terms of Government policy and legislation with respect to Aboriginal land issues.

The EPA therefore amended the initial terms of reference to allow the Working Group to address management issues at the conceptual level but indicated that the Working Group should not attempt to address the legislative implications or requirements of its proposals.

1.3 Representation

In accordance with the request from the EPA, the Department of Conservation and Environment convened such a Working Group comprising representatives of the Departments of Conservation and Environment, Agriculture, Fisheries and Wildlife, Lands and Surveys, Tourism (now WA Tourism Commission), together with the National Parks Authority (now Department of Conservation and Land Management) and WA Museum Aboriginal Sites Department.

* Massif: mountain heights forming a compact group.



Map 1 Kimberley region, showing Bungle Bungle Working Group Study Area.

The commencement of the Aboriginal Land Inquiry and secondment to that Inquiry of the Museum's representative on the Working Group, left the Working Group without a representative of Aboriginal interests.

It was apparent that there was a high degree of Aboriginal interest in the area concerned. Representatives of Aboriginal traditional owners had already attended one meeting as observers and made a positive contribution. Having already established positive contact it was felt that a more direct representation of the Aboriginal owners on the Working Group was appropriate in this instance, for the following reasons.

The Aboriginal method of decision-making by extensive community discussions leading to a decision by consensus and the number and complexity of the issues involved, meant there were clear advantages in this Working Group representative being in the region and able to discuss issues fully with traditional owners on site. It was also important in this context that the representative was well known and credible to the traditional owners. The Warmun Community adviser was subsequently nominated as a member of the Working Group.

The Working Group recognised that the Warmun Community at Turkey Creek represented only some of the traditional owners of the Study Area. Accordingly, several attempts were made to contact other traditional owners now scattered throughout the Kimberley and adjacent areas of the Northern Territory. As a result of these efforts it is understood that a consensus position has been reached by traditional owners with respect to their involvement in the future of the area.

Following correspondence from the Minister of Minerals and Energy, a representative of the Department of Mines was also added to the Working Group in March 1984.

Members of the Working Group were:

Department of Conservation & Environment	Mr G Whisson (Chairman)
Department of Agriculture	Mr A Payne (Mr D Wilcox — Deputy)
Department of Conservation & Environment	Mr J Clarke (until May 1984)
Department of Conservation & Land Management (Formerly National Parks Authority)	Mr R May
Department of Fisheries & Wildlife	Mr N McKenzie
Department of Lands & Surveys	Mr D Smith
Department of Mines	Mr G Beere (from March to May 1984) Mr J Clarke (from May 1984)
WA Museum	Mr M Robinson (until September 1983)
WA Tourism Commission (Formerly Dept. of Tourism)	Mr E Watling (until July 1984) (Mr M Sparrow — Deputy) Mr A Grosse (from July 1984)
Warmun Aboriginal Community	Mr A Tegg (from September 1983)

2 STUDY AREA BACKGROUND

2.1 Location of Study Area

The primary focus of the Working Group's interest, the Bungle Bungle massif, is located in the south-eastern Kimberley region in the far north-east of Western Australia (see Map 1). The massif itself is some 160 km south of Kununurra, 120 km north-east of Halls Creek, and 50 km from the Northern Territory border. It lies within the area administered by the Shire of Halls Creek.

The massif extends over a distance of about 28 km east to west and 20 km north to south for a total area of approximately 450 km^2. It is distinct and separate from other ranges.

The Study Area, defined on page 1, extends over a considerably larger area of some 3500 km^2 surrounding the massif and includes portions of the Osmond Range, Dixon Range and the Ord and Panton Rivers.

2.2 Present Status

The entire massif and the majority of the Study Area lies within C Class reserve No. 28538, established for the purpose of "Regeneration of Eroded Areas in the Ord River Catchment Area".

This reserve, of about 8960 km^2, was gazetted in April 1967 following the resumption of the former Ord River, Turner and parts of the Flora Valley, Elvire Downs and Ruby Plains Pastoral Leases. The reserve is not vested but is administered and managed by the Department of Agriculture for the purposes of stabilising and regenerating vegetation on lands degraded by previous pastoral practices and latterly as a research centre servicing the Kimberley pastoral industry. The action to reserve this land was taken following concern that the estimated 22 000 000 tonnes of sediment washed down the Ord River each year, from overgrazed pastoral leases, may lead to excessive sedimentation of Lake Argyle, and after attempts at regeneration under pastoral lease management failed.

Mustering and destocking are facilitated by the Ord River Dam Catchment Area (Straying Cattle) Act 1967-69,which vests ownership of all cattle within the regeneration area in the Crown.

The reserve has not been declared a soil conservation reserve, or a soil conservation district, under the Soil Conservation Act (1945-1982).

To the north of the reserve, the Study Area extends to include the small Osmond Valley pastoral lease, and the adjacent southern mountainous portions of Texas Downs pastoral lease. These leases expire in the year 2015.

The Bungle Bungle massif and its immediate surrounds have been classified by the National Trust of Australia (WA) because of the area's importance to the natural environment and has been placed on the Register of the National Estate by the Australian Heritage Commission.

2.3 Climate

The Study Area has a dry monsoonal climate. Two distinct seasons occur,the four months summer (wet) season and the (dry) season which occupies the remainder of the year.

There are no weather recording stations located in the Study Area. The nearest stations at Turkey Creek some 40 km to the north-west,and Limbunya Station in the Northern Territory are, however, likely to be fairly representative of the Study Area.

Mean monthly maximum and minimum temperature and humidity figures for Turkey Creek (Tables 1 and 2) illustrate the nature of the climate. During the dry, mean daytime maximum temperatures in the low thirties (°C) usually combined with low humidity and clear skies are a drawcard for tourists. As the wet season approaches, however, mean maximum daytime temperatures climb to a peak of 39.6°C in November and are accompanied by rising humidity. These conditions and those during the wet season proper, from December to March inclusive, when temperatures are slightly lower but humidity remains high, are a major factor in inhibiting visitor numbers to the Kimberley during this period.

The mean annual rainfall of 681 mm for Turkey Creek (Table 3) is likely to be slightly higher than that of the subject area which is further to the south and east. Almost all rain falls

between October and April inclusive and 89% in the four months December to March. Most rain results from high intensity localised falls from convectional thunderstorms. Occasionally, more widespread high intensity rains are associated with the passage of tropical cyclones. The Study Area is far enough inland to escape the worst of the damaging winds associated with cyclones.

Robinson (1970) refers to the rainfall statistics for Limbunya Station, in the adjacent part of the Northern Territory, where records have been kept since 1923/24. He notes the average annual rainfall of 554 mm (probably equivalent to the drier parts of the Study Area), but draws attention to the extreme variability of the annual rainfall, from 105 mm to 1145 m, which highlights the limited value of annual averages. Records for this station show recurring sequences of wet years followed by dry years. Robinson points to long sequences of dry years as playing a major role in the ultimate degradation of pastoral land in this region.

The extreme 24 hour rainfall event of 215 mm and extreme 72 hour rainfall event of 457mm at Halls Creek illustrates the potential of the cyclonic rains. The intensity of the rainfall has implications for the design and location of access routes into and within the Study Area and other facilities that may be required. The susceptibility of many of the soils in this area to erosion following disturbance should also be considered, in the light of anticipated intense rainfall episodes, in future plans for this area.

Climatically it is the nature of the wet season, particularly the major rainfall event and the variability in rainfall that results in sequences of dry years, which will be of critical importance in setting planning and management parameters.

Table 1 Mean Monthly Maximum and (Minimum Temperatures) (°C) for Turkey Creek

Station	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
Turkey Creek	37.6 (24.6)	36.4 (24.3)	36.0 (22.9)	35.4 (20.2)	32.2 (17.5)	30.2 (14.1)	29.4 (12.3)	32.4 (14.9)	35.9 (18.7)	38.7 (22.9)	39.6 (24.7)	39.3 (24.9)	35.3 (20.2)

Table 2 Mean Relative Humidity — 0900 hrs (and 1500 hrs) (%) for Turkey Creek

Station	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
Turkey Creek	54 (37)	58 (40)	49 (35)	33 (25)	33 (27)	36 (27)	24 (19)	22 (17)	23 (18)	26 (20)	34 (23)	40 (28)	36 (26)

Table 3 Mean Rainfall (& No. of Wet Days) (MM) for Turkey Creek

Station	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
Turkey Creek	170 (13)	168 (11)	102 (8)	26 (2)	11 (1)	7 (1)	6 (1)	2 (0)	4 (0)	18 (3)	54 (7)	113 (10)	681 (57)

(Source: Bureau of Meteorology)

2.4 Geology and Geomorphology

2.4.1 Brief Geological History

The oldest rocks of the region are geosynclinal sediments called the Halls Creek Group. Though the record of past events affecting these rocks is now only fragmentary, sufficient rocks are exposed to indicate that the Group was laid down over the whole of the East Kimberley region, probably in Archaean time (2,500 million years or more before present). It has subsequently been tightly folded, slightly metamorphosed and invaded by basic sills and dykes, some of which are thousands of metres thick.

A second period of more intense folding affected rocks over most of the region, and was accompanied by high-grade metamorphism along a narrow belt to the west of the Study Area called the Halls Creek Mobile Zone. Granitic rocks were then intruded along the Mobile Zone. The end product of this cycle of activity is the igneous-metamorphic complex called the Lamboo Complex.

In early Carpentarian times, the type of deformation changed radically and the area reacted to stress during the rest of the Proterozoic almost entirely by dislocation along great faults which follow the Mobile Zone. It is possible that the displacement on these faults was predominantly horizontal. During this time the areas east and west of the Mobile Zone were tectonically competent blocks in which the only deformation consisted of broad warpings over large areas, accompanied by minor faulting.

Only along the Halls Creek Mobile Zone did intense deformation and minor igneous intrusion continue after the early Proterozoic and during much of this time the Mobile Zone influenced sedimentation to the east and west.

A glacial epoch towards the close of the Proterozoic (Adelaidean) has left a remarkable record of extensive ice caps, and a thick cover of glacial sediments.

In the Lower Cambrian, outpourings of basalt covered almost all the Study Area, and are now exposed over extensive areas of the Precambrian rocks south-east of the Study Area. They are exposed in the Study Area in narrow outcroppings to the west and north of the Bungle Bungle massif.

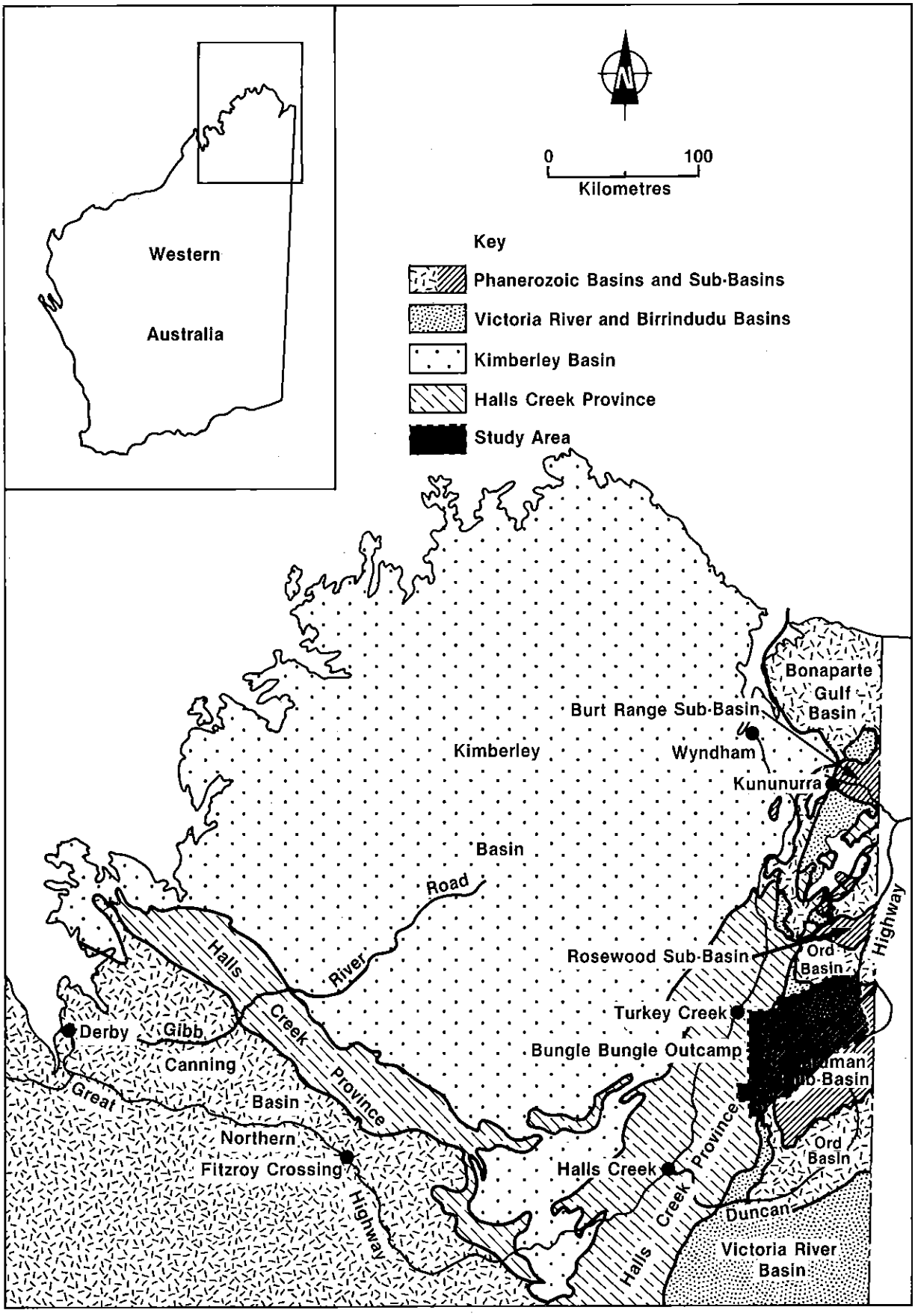
Marine transgressions in the lower to middle Cambrian resulted in cyclic deposition of sediments in a series of basins throughout the region. The Hardman Basin, a sub-basin of the Ord Basin (see Map 2), developed south of what is now the Osmond Range. It covered most of the Study Area and extends beyond this area to the south and east into the Northern Territory. It is an asymmetrical structural basin formed as a result of upward drag along faults along its northern and western margins.

The Cambrian sediments consist of alternating conformable layers of hard crystalline limestone and soft shales (the Negri Group). This is the only basin in the region in which the Cambrian sediments are extensively exposed.

Following uplift and erosion, a massive cross-bedded white sandstone about 450 metres thick, the Elder Sandstone, was deposited in Devonian times, some 350 million years ago. It is the eroded remains of the Elder Sandstone which today forms the Bungle Bungle massif together with smaller remnants, the Dixon and Hardman Ranges to the south and White Mountain Hills to the east. It is also the parent material for the sandy plains of the Buchanan land system (Page 15).

In the centre of the Bungle Bungle massif is an elliptical area, some 6 km x 7 km in diameter of anomalous deformation and silicification within essentially underformed Devonian sediments: the Piccaninny Structure. It occurs on the eastern limb of the Hardman Syncline and is bounded by two prominent joint sets, trending north-east and south-east. Elsewhere the precise boundary is diffuse, but is defined by a marked change in joint density and orientation, or a change in dip of the bedding. The structure consists of an outer zone of low-angle, inwardly dipping beds enclosing an inner zone 4 km in diameter of relatively intense, large scale, disharmonic folding (Beere 1983).

Circular features (See Landsat image Map 3 and Map 7) with this basin-and-central-uplift structure are characteristic of large impact craters. Fieldwork in 1984 and 1985 has confirmed that the Piccaninny structure is a very large and deeply eroded crater caused by the impact of an extraterrestrial body (Beere, Shoemaker and Wilson, pers. comm.)



Map 2 Tectonic Provinces in the Kimberley region

There are only a few large impact sites on the earth's surface, and the Piccaniny Structure, because it is very well exposed, affords one of the best views of the deep root zones of such features.

Geology and Geomorphology of the Bungle Bungle massif from the vicinity of the Bungle Bungle outstation (foreground). The structural plateau of the Bungle Bungle massif, formed from largely flat-lying Elder sandstone is clearly apparent in the background. Strike ridges of Headley limestone (foreground) and Hudson sandstones (middle distance), of the underlying Negri Group, mark the north-western limit of the Hardman Sedimentary Basin.

2.4.2. Geomorphology of the Bungle Bungle Massif

This section does not attempt to describe the geomorphology of the whole Study Area, only that portion which constitutes the Bungle Bungle massif. A brief description of the geomorphological components of the Study Area is made in the following section.

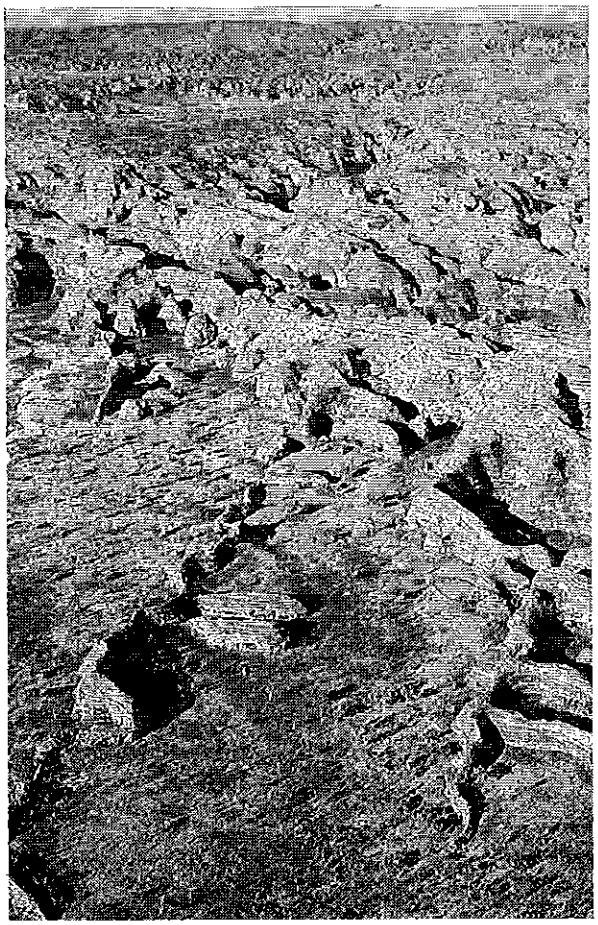
The Bungle Bungle massif is a structural plateau of Elder Sandstone whose massive beds in places tower nearly 300 metres above the surrounding sand plain. The plateau features spectacular sheer sides, incised by numerous canyons and arrays of silicified towers. Intense jointing and subsequent silicification has produced hard, resistant ribs that project out into the surrounding sand plain. The scale, form and variety of landforms associated with the plateau are impressive.

The arrays of sandstone towers, which have come to be regarded as the characteristic landform of the Bungle Bungle massif, are best developed on the north-easterly and southern sides of the plateau. They occur in three distinct positions in the landscape (Young, in press):

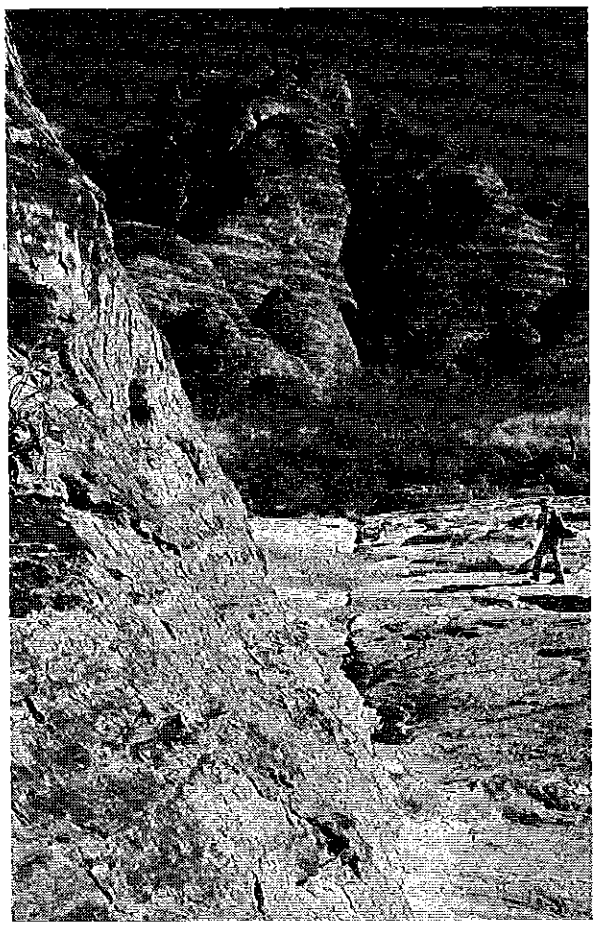
- towers on the plateau surface are believed to be remnants of an initial stage of erosion below the ancient surface, which can still be traced across the high sumits of adjacent ranges;
- towers and chasms on the sides of the plateau are the product of a contemporary phase of erosion; and
- clusters of towers which rise abruptly from the plain surrounding the plateau are features believed to have been isolated from the plateau by the expansion of sediment leading down to tributaries of the Ord River.

Two basic forms can be identified in the array of sandstone towers:

- steep-sided, generally convex towers, partly or completely separated by narrow gullies.
- narrow and generally sinuous ridges,separated by flat-floored valleys, the valleys widening as erosion proceeds. This type of valley is produced by the dominance of side-slope retreat over stream incision.



Silicification of joint sets in two directions has produced these hard resistant ribs that project out into the surrounding sandplain; the north-eastern edge of the Bungle Bungle massif.



An example of structural control of the sandstone tower topography exerted by open joints; Piccaninny Creek near the southern edge of the massif.

Two processes have been suggested as being important in shaping the landscape of sandstone towers: solution of the silica sand grains and matrix between the grains; and fretting of the sand grains through precipitation in the rock surface of salts collected by rainwaters percolating through the porous sandstone and evaporating at the surface.

Jennings (1983) argued that the karst-like morphology of some sandstones in Northern Australia was the product of millions of years of tropical weathering. He speculated that the critical, though not necessarily dominant, process in their formations was a solutional loss from the surface of quartz grains eventually causing the grains to fall apart and that the landforms were thus examples of sandstone karst topography. Recent work by Young (in press) at Bungle Bungle supports Jenning's idea. He writes that the Elder Sandstone was not always friable referring to studies by Veevers (1969), which indicate that the Elder Sandstone must at one time have been deeply buried and compacted. Thin-section microscopic analysis of the sandstone undertaken by Young supports this conclusion. It shows that many quartz gains are closely interlocked and have distinct overgrowths and in some cases sutured contacts, indicating that considerable pressure solution and cementation by the growth of secondary quarta certainly did occur. Yet the thin-section analysis also shows that cementation was followed by intense dissolution of the sandstone, to the extent that many grains are now separated by open voids, furthermore scanning electron microscopy reveals that extensive overgrowths have been very intensely corroded (Young in press). He considers this a "striking illustration of Jennings' contention that solution was critical to the formation of towers like these", but that the towers are subsequently sculptured by the physical disintegration and erosion of the intensely weathered sandstone.

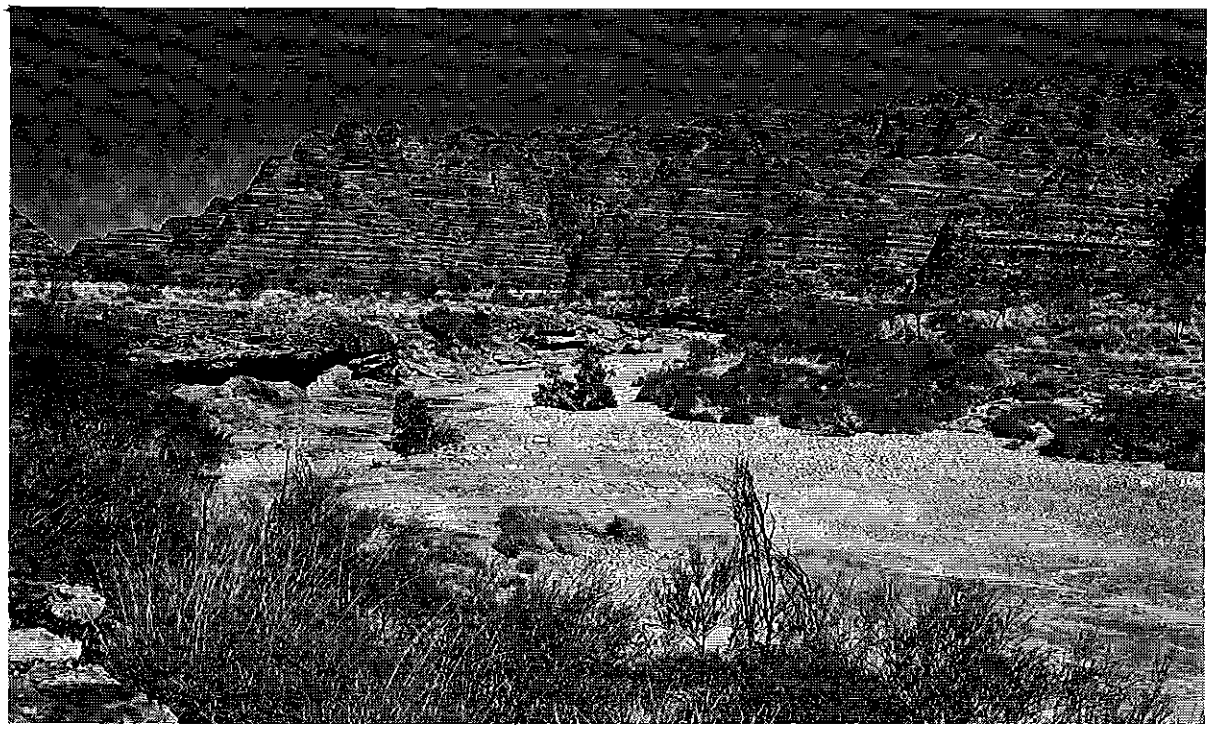
The action of salt precipitation on the rock surface leading to fretting of the sand grains has been suggested (Clarke, pers. comm.) as a process involved in-side slope retreat. This process can be seen operating in some shallow caves, where the salts are not washed off

the surface by rainfall. Many caves are coated by silica or algal skins which indicates that cave growth has virtually ended as the silica skins, being largely impervious to water, prevent the evaporation of groundwater and thus the rock-destroying precipitation of salts.

The sandstone itself is mechanically weak. It can be crushed in the hand and readily crumples underfoot. This weakness reflects the almost complete weathering and leaching of the matrix holding the sand grains together. Once the surface skin is broken the sandstone rapidly disintegrates.

The friable nature of the slopes and the importance of the thin surface skins in protecting them are key factors in the conservation of this landscape.

These skins also constitute one of the more striking features of this landscape, the horizontal orange and black bands, which are, respectively, silica and algal skins. Although the banding gives an initial impression of major variations in rock type, field and laboratory analyses show a high degree of uniformity of rock underneath the bands. The development of the silica skins seems to be controlled by movement of groundwater along bedding planes, which imparts the dominant horizontal component to the banding. The native rock underneath the bands is generally white in colour.

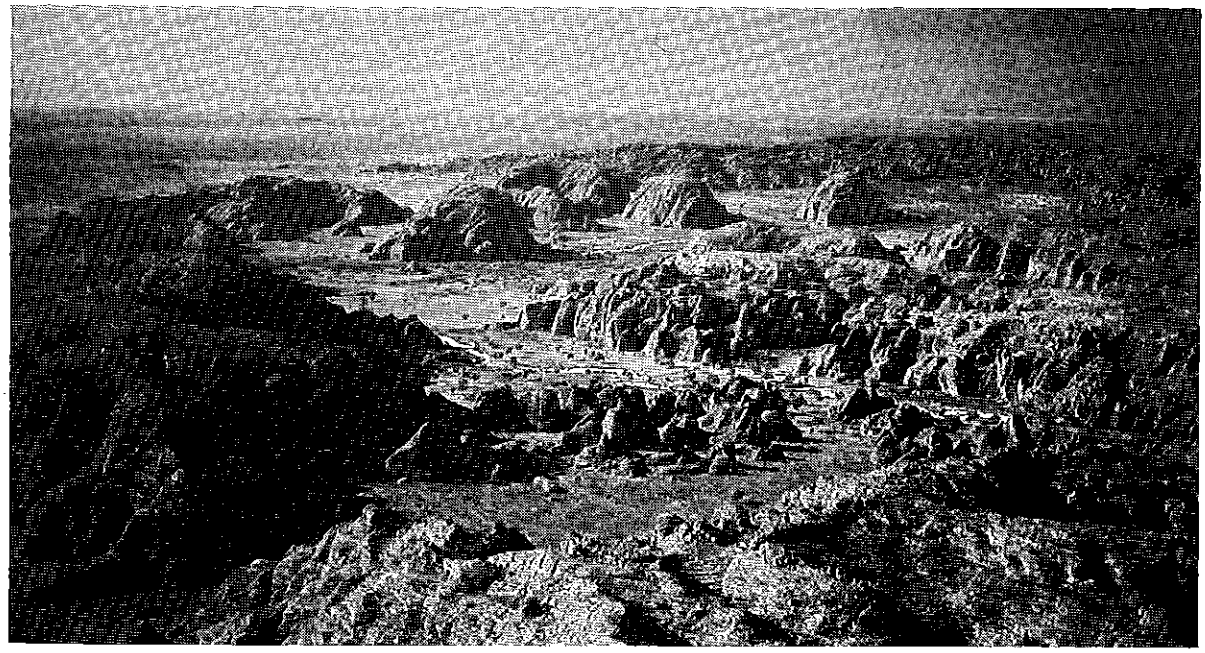


Orange and black bands developed along bedding planes are one of the more striking features of the Bungle Bungle massif. The bands result from alternating skins of silica and kaolinitic clay, and algal growth developed on the surface of the rock; beneath the coloured skins the rock is white and appears remarkably uniform.

The landforms apparent across the Bungle Bungle massif change from one area to another reflecting critical changes in the sandstone and the varying density of joints. Along the western edge of the range the plateau forms a more or less continuous cliff broken in relatively few places, chiefly in the north-west, by narrow gorges. This reflects a higher proportion of pebble conglomerate beds with greater stability and erosion resistance due to the higher content of quartz conglomerate and fewer intersecting joint lines.

Similarly, in Piccaninny Gorge the rounded towers abruptly give way to sheer vertical joint-controlled walls as the gorge intersects more resistant low-grade metamorphic rocks associated with the anomalous deformation of the Piccaninny Structure.In the south-western corner very intense jointing has a controlling influence producing irregular joint-bounded cliffs of less impressive stature.

The age of the landforms of Bungle Bungle is uncertain, though the flanks of the plateau and the clusters of towers nearby almost certainly post-date the deposition of sediments of probable Miocene age which are found some 35 km away on the eastern side of the Ord River (Paterson 1970; Dow and Gemuts 1967).



The eastern side of the Bungle Bungle massif features highly dissected sandstone tower formations and broad valleys virtually enclosed by spectacular sandstone isolates rising sheer from the sandy valley floor.

Picaninny Creek Gorge dissects the central plateau, its course strongly controlled by jointing. The arrays of sandstone towers marking the highly dissected edge of the massif are visible in the distance.

Given the friable nature of much of the sandstone, it might be presumed that erosion was very rapid and that the landforms are therefore very young. On the other hand, the arid climates which have prevailed for much of the time since the Miocene (Wyrwall 1979) would have retarded erosion. A considerable age for the gorges of Bungle Bungle is suggested by the presence of lateritic alluvial gravels which survive in places along the modern channels. Furthermore, a deposit of gravels, strongly cemented by silica, which lines the backwall

of a waterfall on a tributory of Piccaninny Creek also indicates a considerable age for the gorges. Also, patches of thin laterite survive on pediments at the foot of the plateau. Even under the modern, moister climate, which has prevailed for some 6,000 years, erosion is limited mainly to the 4 wet months of the year.

2.5 Land Systems

The land systems in the Study Area have been delineated and mapped by Stewart et al. (1970) as part of a broader survey of the Ord-Victoria Area. De Salis (1982) subsequently mapped part of the Ord River Regeneration Reserve including the Study Area in greater detail, describing the relatively more productive pastoral areas to the level of land unit, assessing soil and vegetation condition and mapping eroded areas (see Map 3).

Land systems are broad areas within which there are recurring patterns of topography, soils and vegetation. Land units are a finer level of classification being areas sharing the same or similar geological soil or vegetation characteristics.

Areas within the same land unit in the classification can each be expected to react in a similar and therefore relatively predictable manner to a given stress. This makes the land system method of classification a particularly useful management tool.

De Salis delineates eleven land systems within the mapped section of the Ord River Regeneration Reserve, of which seven land systems, closely reflecting the underlying geology, occur within the subject area.

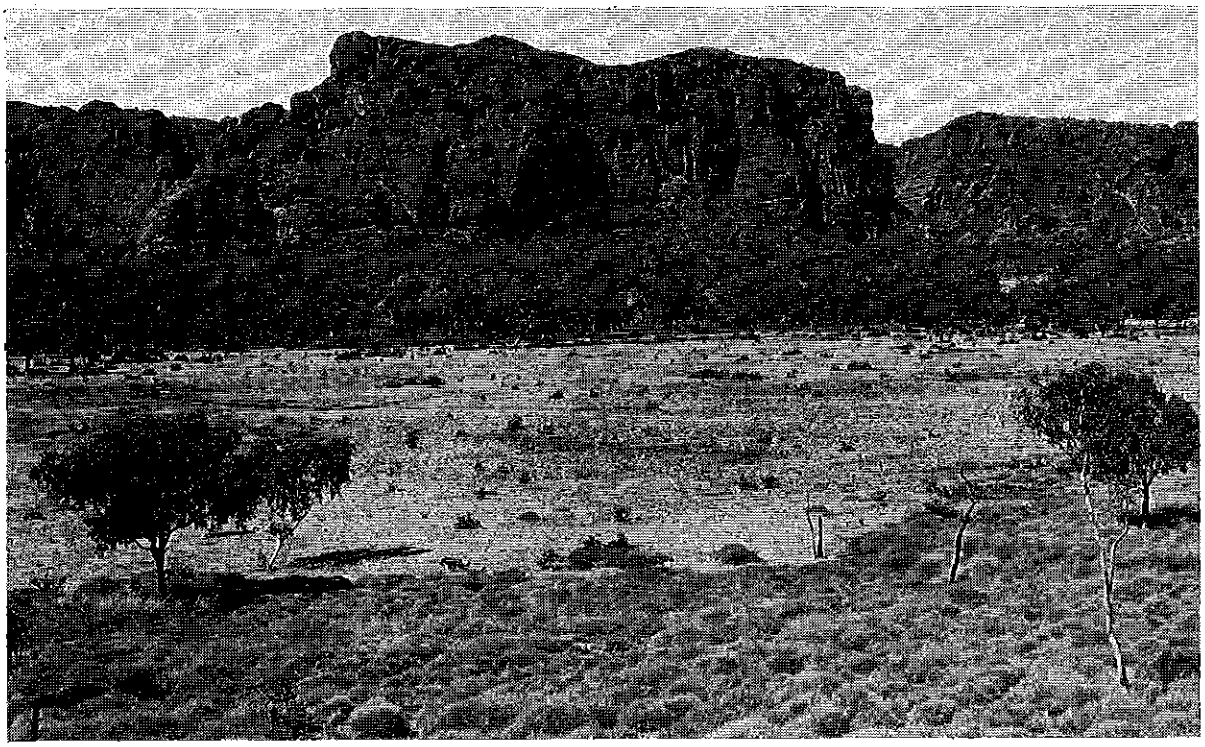
A brief description of the physical and biotic characteristics, and condition of each of the land systems and associated land units within the Study Area is given below, based largely on the work by de Salis, with additional vegetation information from Scarlett (1984), Beard (1979), Kenneally (pers. comm) and the Working Group's own observations.

2.5.1 Antrim Land System

Land units — Rugged Uplands, Lowlands.

Location — The Antrim land system is situated in the main to the south of the Study Area. However, it is present as a narrow strip to the west and north of the Bungle Bungle massif where it marks the edge of the Hardman Sedimentary Basin.

Geology — Confined to Antrim Plateau Volcanics, principally basalts of Lower Cambrian age.



Land systems along the north-western edge of the Bungle Bungle massif. The overgrazed and eroded valley floor of the Antrim Lowland unit dominates the foreground. In the middle distance a narrow strip of the Buchanan Sand Plain unit supports a savannah woodland, dominated here by *Eucalyptus collina* and *E. pruinosa*. The vertical cliffs of the Bungle Bungle massif delineates the Elder Upland land unit.

Alluvial soils and outwash deposits of the Antrim Lowlands along Red Rock Creek support a tree savannah dominated by *Eucalyptus dichromophloia* and *E. tectifica* over the grasses *Aristida* spp. and *Heteropogon contortus*. Smaller areas are dominated by Ghost Gum (E. papuana) as in this photograph.

Geomorphology — Within the Study Area the land system consists of rough, stony hills, and associated narrow outwash plains (respectively the upland and lowland land units).

Soils — Lithosols in uplands, juvenile cracking clays on the outward plains.

Vegetation — Upland unit: sparse tree steppe of *Eucalyptus brevifolia* over Spinifex (*Triodia* spp.). Lowland unit: sparse tree savannah of *Eucalyptus tectifica* and *E. dichromophloia* over the grass (*Chrysopogon fallax*),with dense woodlands of Freshwater Mangrove (*Terminalia platyphylla*) along streamlines (Scarlett 1984).

Condition — Upland areas stable,lowland unit severely degraded with extensive sheet and gully erosion. Donkeys and feral cattle common.

2.5.2 Buchanan Land System

Land units — Uplands, Sand Plain, Frontage.

Location — Forms much of the core of the Study Area in association with the Elder land system (below).

Geology — Derived from the underlying Elder Sandstone.

Geomorphology — A structural bench forming extensive undulating sand plains.

Soils — Deep siliceous red and yellow sands and red and yellow earths and on the narrow frontage plains fine white sands.

Vegetation — Upland unit: shrubland of *Acacia tumida* and *Grevillea wickhamii* over Spinifex. Sand Plain unit: savannah of *Eucalyptus collina* and *E. brevifolia* over *Acacia* shrub layer including *A. tumida*, which may be very dense,with an understorey of Spinifex and Wiregrass (*Eriachne* spp.). Frontage Plain unit: fringing communities including *Acacia, Grevillea* and *Eucalyptus* species form along stream frontage plains.

Condition — All units are in good condition with no erosion.They are usually distant from water, feature vegetation generally unpalatable to stock, and have thus attracted little grazing pressure. Sandy soils break down under vehicle usage.

LEGEND

Antrim Land System

Au Rugged Uplands — Mesas, buttes and structural benches on volcanics, hard spinifex on lithosols, no erosion

Al Lowlands — Lower slopes and plains on volcanics, limestones and shales. BSP, short grass, hard spinifex and kapok disclimax, severe and extensive degradation and erosion

Buchanan Land System

Bu Uplands — Sandstone boulders and rock outcrops, hard spinifex and acacia shrubland, no erosion

Bp Sand Plain — Extensive undulating sandy plain on Elder sandstone, acacia shrubland on deep sands, no erosion

Bf Frontage — Streamlines, banks and levees on Osmond R. and Buchanan Ck., acacia shrubland, no erosion

Dockrell Land System

Do Rugged Uplands — Complex fold mountains on Archean sediments and metamorphics, hard spinifex on lithosols, no erosion

Elder Land System

Eu Uplands — Structural plateaux and joint blocks on Elder, sparse hard spinifex on lithosols, no erosion

El Cuestas — Rugged cuestas and backslopes to 40 m on sandstone, hard spinifex and acacia shrubland on lithosols, no erosion

Ep Lower Slopes — Cuesta footslopes on Hudson shale, hard spinifex, acacia shrubland and some annuals, extensive degradation and erosion

Headley Land System

Hu Upper Slopes — Rugged cuestas and backslopes on limestone, hard spinifex on lithosols, no erosion

Hl Lower Slopes — Lower backslopes on limestone, short grass on gravelly calcareous soils, some degradation and erosion

Hs Cracking Clay Complex — BSP vegetation on cracking clays, and short grass and kapok disclimax on calcareous loams, some degradation and erosion

Nelson Land System

Nc Cuestas — Limestone up to 15 m, hard spinifex, short grass and kapok disclimax on skeletal soils, no erosion

Nb Cuesta Backslopes — Formed on limestone, hard spinifex, short grass and kapok disclimax on calcareous soils, some degradation

Ns Cracking Clay Plains — Flat cracking clay plains adjacent to rivers on Quaternary alluvium, BSP vegetation, some degradation and erosion

Nu Interfluve Upper Slopes — Formed on shale, kapok disclimax on friable calcareous soils, severe degradation and erosion

Nl Interfluve Lower Slopes — Formed on shale, kapok disclimax on friable calcareous soils, severe degradation and erosion

Nf Frontage — Banks, levees and backslopes on fluviatile deposits. Birdwood, hard spinifex, kapok disclimax and BSP, severe degradation and erosion

Nr Low Rises — Up to 20 m on limestone, hard spinifex, short grass and kapok disclimax on shallow soils, some degradation

Wickham Land System

Wk Rugged Uplands — Ridges, hogbacks, and cuestas on sandstones and shales, hard spinifex on lithosols, no erosion

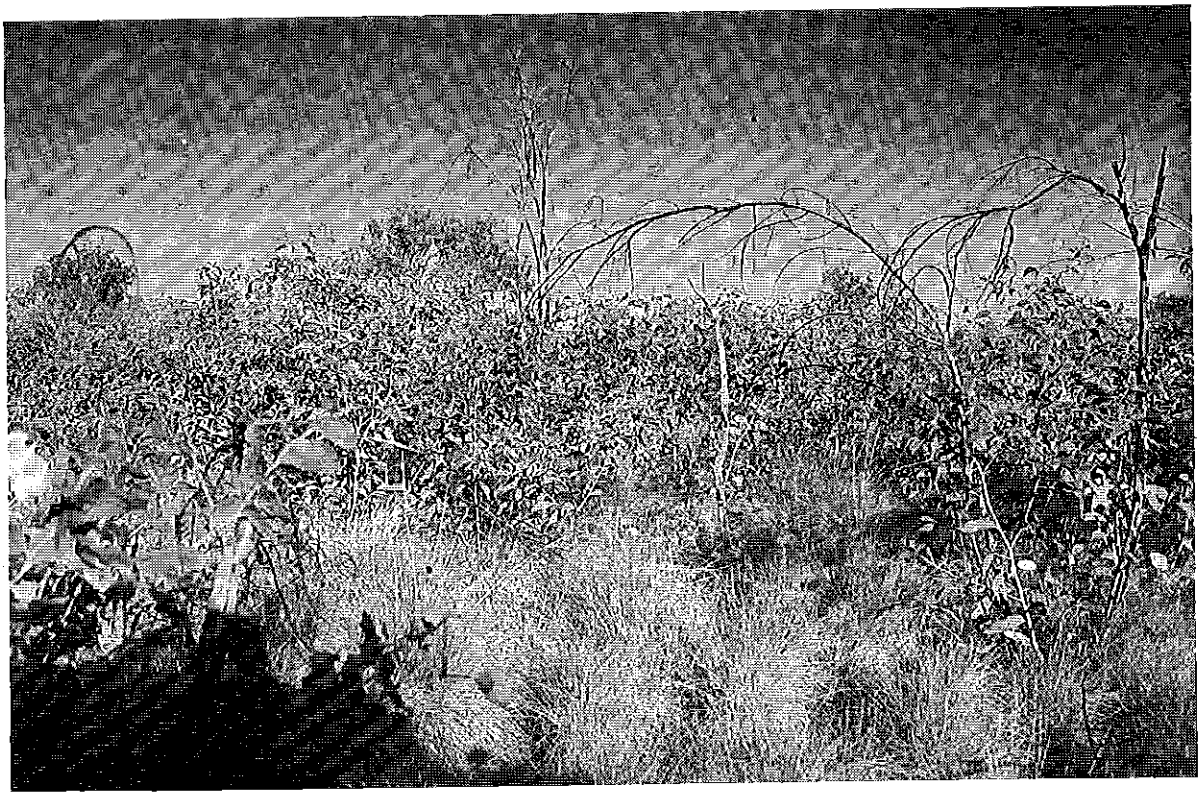
Eroded and/or Degraded Areas

Scalds from severe sheet erosion

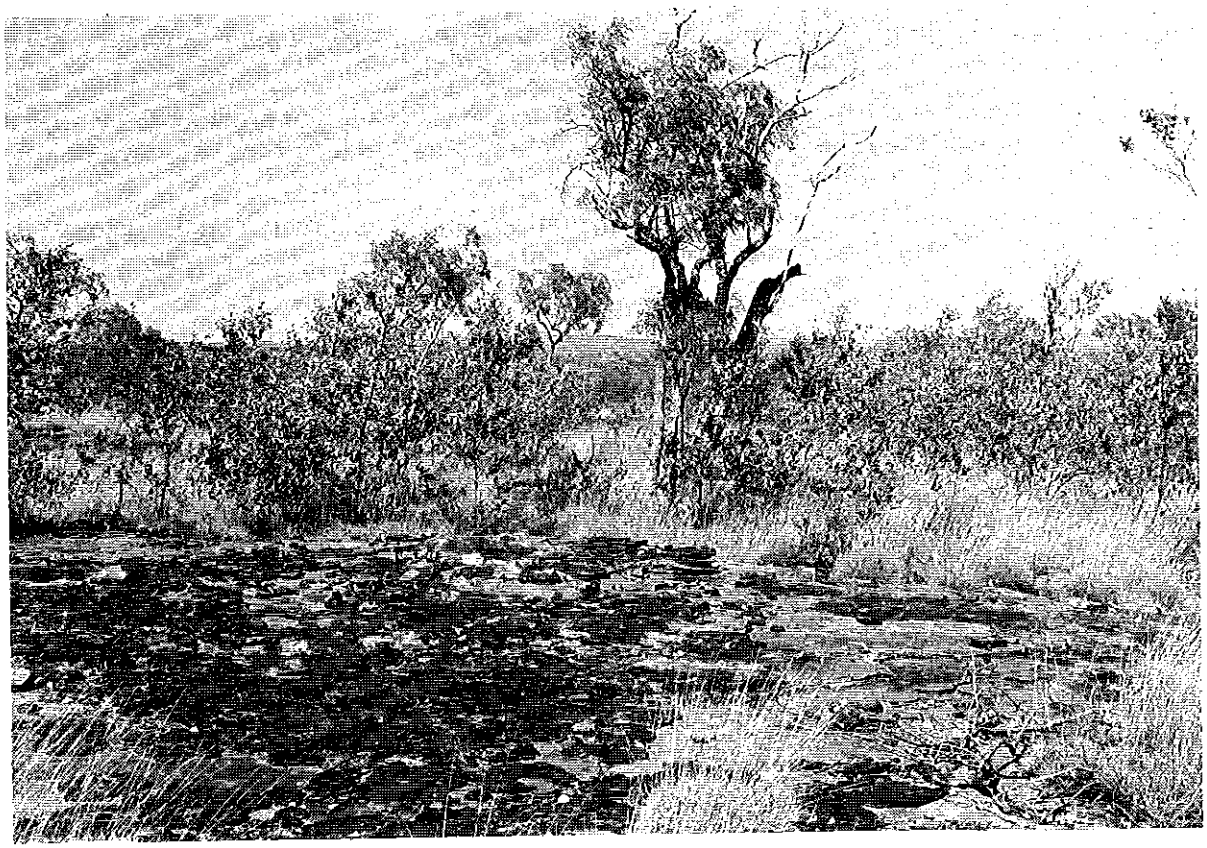
Active gullying

Study Area

Map 3 Land Systems in the Study Area



The Buchanan Sand Plain unit is typically a savannah of *Eucalyptus collina* and *E. brevifolia* over an open Acacia shrub layer and ground cover of Spinifex and Wiregrass (*Eriachne* spp.). However, in many areas the Acacia shrub layer is very dense, as in this photograph taken south of the Bungle Bungle massif, where *Acacia tumida* is dominant.



The plateau of the Bungle Bungle massif (Elder Uplands unit) is devoid of soil, the dissected rock pavement supports a sparse tree steppe of *Eucalyptus pyrophora* and *E. collina*. The scattered shrub layer is dominated by *Grevillea wickhamii* with *Acacia acradenia* and *A. eripoda* also common.

2.5.3 Dockrell Land System

Land unit — Rugged Uplands.

Location — The Dockrell land system is located along the western boundary of the Study Area running parallel to the Halls Creek Mobile Zone.

Geology — Sedimentary and metamorphics of the Archean period predominantly sub-greywacke, phyllite and conglomerate rocks.

Geomorphology — Complex folded hills and ridges.

Soils — Sparse gravelly lithosols.

Vegetation — The hills are dominated by a tree steppe of *Eucalyptus brevifolia* and *E. dichromophloia* over Spinifex understorey. Stream valleys feature narrow riparian woodlands dominated by *Tristania grandiflora.*

Condition — Inherently stable lands with vegetation which is largely unpalatable to stock, has suffered little grazing pressure and is in excellent condition.

2.5.4 Elder Land System

Land units — Uplands, Cuestas* Lower Slopes.

Location — An extensive land system which includes the Bungle Bungle massif,it is the core of the Study Area.

Geology — Confined to Elder Sandstones and sand plains derived from this parent rock.

Geomorphology — Structural plateau (Bungle Bungle) and cuestas.

Soils — Exposed rock to sandy lithosols on the upland and cuesta units, sandy to friable calcareous soils on the lower footslopes.

Vegetation — Uplands, Cuestas and Cuesta Backslopes units: low tree steppe of *Eucalyptus pyrophora* with associated tall shrubs such as *Grevillia wickhamii* and *Acacia* spp. over Spinifex understorey (Scarlett 1984).

Lower Slopes land unit: sparse savannah of *Eucalyptus spp. Terminalia* spp. and *Acacia* spp. over Ribbon Grass (*Chrysopogon fallax*).

Condition — Uplands and Cuestas land units show no degradation or erosion. They attract little grazing pressure as the vegetation is unpalatable and the land often inaccessible to stock and distant from water.

Lower Slopes land unit, fair condition with some gutters and sheet erosion on the calcareous soils. Evidence of fairly heavy grazing on this unit.

2.5.5 Headley Land System

Land units — Upper Slopes, Lower Slopes, Cracking Clay Complex (the Cracking Clay Complex unit is not represented in the Study Area).

Location — The major portions of this land system are located south of the Study Area. Within the Study Area it forms a narrow zone adjacent to the Antrim land systems as far north as the Dixon Range. The rocks associated with this unit continue to outcrop further north along the valleys west and north of the Bungle Bungle massif but not on a mappable scale.

Geology — Hard crystalline Headley Limestone.

Geomorphology — Limestone cuestas and strike ridges.

Soils — Exposed limestone and stony calcareous lithosols and loams.

Vegetation — Upper slopes: spinifex with Fig species including *Ficus platypoda* prominent on limestone outcrops. Lower Slopes: tree steppe of Inland Bloodwood (*Eucalyptus terminalis*) and Nutwood (*Terminalia arostrata*) over Spinifex and short grass pastures.

* Cuesta: asymmetrical ridge, a gentle slope parallell to the strata, terminated by a steep breakaway.

Condition — Upper Slopes: good condition, the rocky soils are intrinsically stable and the vegetation attracts little grazing pressure. Lower Slopes: fair condition, the friable soils supporting short grass pastures have suffered some surface stripping and isolated occurrences of active erosion.

2.5.6 Nelson Land System

Land units — Cuestas, Cuesta Backslopes, Cracking Clay Plains, Interfluve Upper Slopes, Interfluve Lower Slopes, Frontage, Low Rises.

Location — This land system lies along both sides of the Ord River between the White Mountain Hills and the Hardman Ranges.

Geology — Calcareous limestones and shales of the Negri Group.

Geomorphology — Erosional plain of the Hardman Basin.

— Cuestas, Cuesta Backslopes and Low Rises land units:

Soils — Stable calcareous soils, often skeletal with minimal profile development.

Vegetation — Predominantly Spinifex (*Triodia wiseana*),short grass and Kapok Bush pastures, beneath a sparse upper-storey of Inland Bloodwood (*Eucalyptus terminalis*), Nutwood (*Terminalia arostrata*) and *Acacia farnesiana*.

Condition — Fair condition, some erosion and degradation, past overstocking has resulted in Spinifex being replaced by the introduced pioneer species Kapok Bush (*Aerva javanica*).

— Cracking Clay Plains land unit:

Soils — Black soil plains, transitional to heavy cracking clays of river flood plain.

Vegetation — Savannah of Bauhinia (*Lysiphyllum cunninghamii*) and Coolibah (*Eucalyptus microtheca*) over black soil plain perennial grassland dominated by Mitchell Grass (*Astrebla* spp.), with Feathertop (*Aristida* spp.) on transitional soils.

Condition — The unit is in fair to good condition with degradation and erosion generally confined to fringe areas.

— Interfluve Upper Slopes and Lower Slopes units:

Soils — Grey-brown calcareous desert loams and clays. Thin surface crusts are common but the soils are friable and powdery if disturbed. The surface crust inhibits water infiltration rate and results in high runoff rates.

Nelson Frontage unit, severe gully erosion north of the Ord River (1984). This erosion is a direct result of long term overgrazing of fragile calcareous soils under the open range pastoral system. Fencing to exclude feral cattle and donkeys from these lands is a high priority and prerequisite for successful regeneration.

Vegetation — Kapok Bush is the dominant with Buffel Grass (*Cenchrus ciliaris*) and Birdwood Grass (*Cenchrus setiger*), all introduced pioneer species. A middle and upper-storey is confined to creeklines where sparse Inland Bloodwood (*Eucalyptus terminalis*), Bauhinia and *Acacia farnesiana* occur.

Condition — These units are in poor condition. The Lower Slopes unit, in particular, has suffered severe accelerated erosion. Both units were largely devoid of vegetation when the regeneration project began.

— Frontage land unit:

Soils — Unconsolidated micaceous sands, silts and loams associated with the Ord River flood plains.

Vegetation — The river fringing woodland consists of trees of 10–20 metres including River Red Gum (*Eucalyptus camaldulensis*),Coolibah (*E. microtheca*), Nutwood (*Terminalia arostrata*) and Cadjeput (*Melaleuca leucadendron*). The upper-storey on the levees and levee backslopes is structurally more open and lower and includes Bauhinia, Ghost Gum (*E. papuana*) with thickets of *Acacia farnesiana* over a ground storey of mixed perennial grasses including Birdwood Grass.

Condition — The unit is severely eroded and degraded. Cattle congregating along the river on this unit exert heavy grazing pressure and disturb the friable alluvial soils. The introduction and successful colonisation of Birdwood Grass on the banks has produced some stabilisation but further establishment is hampered by grazing pressure. Levees and backslopes have been sheet eroded and are extensively degraded.

2.5.7 Wickham Land System

Land Unit — Rugged Uplands.

Location — The Wickham land system comprises the Osmond Range, located along the northern and north western boundaries of the Study Area extending beyond the Study Area in the west to the Halls Creek Mobile Zone.

Geology — Formed on shales, siltstones, sandstone, conglomerates and dolomites of the Proterozoic period. It forms the geographic barrier in the northern and north-western edges of the Hardman Sedimentary Basin.

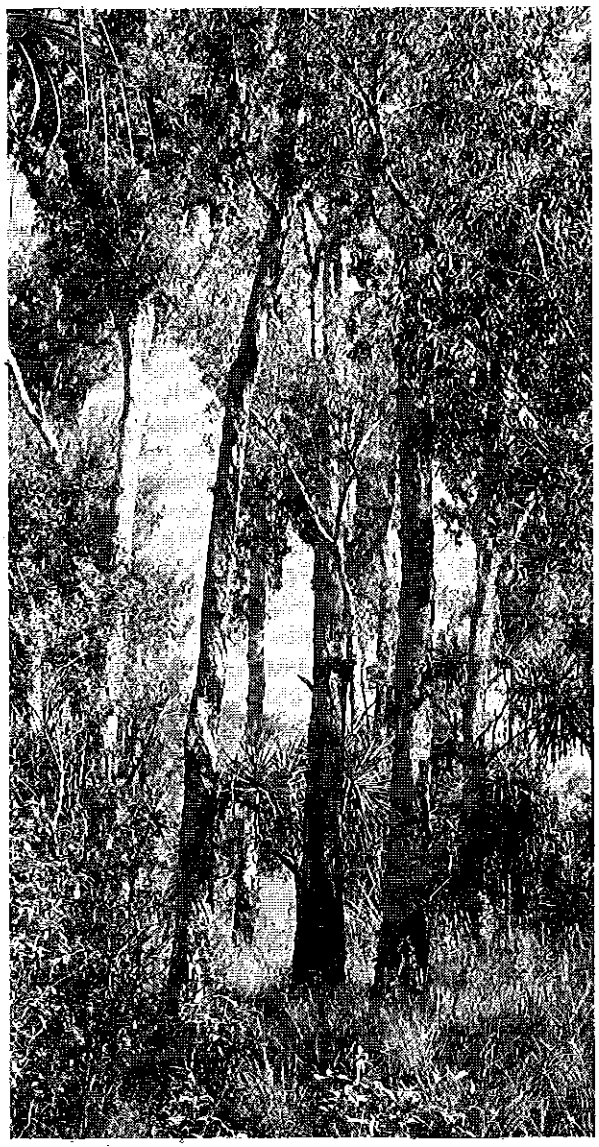
The Ord River towards the end of the dry season. Fringing vegetation dominated by River Red Gum (*Eucalyptus camaldulensis*), Coolibah (*E. microtheca*) and Cadjeput (*Melaleuca leucadendron*) lining the river channel, and the eroded Frontage unit of the Nelson land system to the north (right) of the river, is clearly apparent.

Geomorphology — Strike ridges and cuestas formed on a faulted anticline with intense drainage patterns and rugged inaccessible terrain.

Soils — Stony lithosols between rock sheets, boulders and outcrops, duplex soils on mid and lower slopes and some development of dark clay loams in major valley bottoms.

Vegetation — A tree steppe of *Eucalyptus collina, E. brevifolia* and *E. terminalis* over a Spinifex understorey of *Triodia* and *Plectrachne* spp. dominates the ranges. Permanent streams and small swamps are notable for their *Melaleuca leucadendron* open forest, Pandanus low open forest and woodland and associated patches of dense riparian forest. The riparian forest is composed of species such as *Syzygium angophoroides, Ficus coronulata, Nauclea orientalis* and *Carallia brachiata,* over a lush understorey frequently dominated by the fern *Cyclosorus interruptus* and Taro (*Colocasia esculenta*).

Condition — The upland areas are inherently stable and inaccessible to stock and are in excellent condition. Some of the broader valleys in Osmond Valley pastoral lease show evidence of localised sheet and gully erosion but are largely in good condition. Donkeys and cattle are common in valley areas.



Perennial streams in the Osmond Range support riparian (riverine) forests. The Cadjeput (*Melaleuca leucadendron*) is extremely common and usually associated with a dense understorey of screwpine (*Pandanus spiralis*). Other tree species include *Syzygium angophoroides, Ficus coronulata, Nauclea orientalis* and *Euodia ellereyona*, a species only recorded in one or two other locations in the Kimberley.

A number of spring-fed swamps emanate from the Osmond Range. Here Taro *(Colocasia esculenta)* and the fern *Cyclosorus interruptus* dominate under Screwpine *(Pandanus spiralis).*

2.6 Pastoral History

Land in the Kimberley was available for lease from 1880. At this time William Osmond and John Panton of Melbourne acquired several runs in the Ord River Valley which became the Ord River Station. These were amongst the first East Kimberley leases stocked. By the late 1880s Osmond and Panton held over 2 million acres (900,000ha).

In 1894 Panton sold out to Osmond who then enlarged the run by taking up the Nicholson Plains country and land north and west of the Ord. Stock on the Ord River Station were concentrated on better waterholes and fed exclusively on the narrow strip of country along the rivers, but were none the less reported to be breeding quickly. It was noted, even then, that the good pastoral land along the rivers became over grazed if the wet season was late.

In 1894 the Wyndham jetty was completed and, as Bolton (1953) records, with it came the opportunity to organise the East Kimberley cattle trade. From 1893 to 1898, a 'motley assortment of smallholders' (Bolton 1953) took up blocks between Halls Creek and Wyndham.The smallholders were usually pushed to the marginal land while the established and wealthier concerns consolidated their holdings around the great rivers.

The expansion of pastoral leases encroached on Aboriginal lands, however Bolton (1953) records that there are no known reports of stock killings prior to the wet season of 1885-86. He surmises that wild game was still plentiful.

Tension was increasing however, and at about this time in both the east and west Kimberley, spearings occurred and incidents were recorded where police and settlers fired at Aboriginals. It appears that the latter incidents reflected the irritation of the pastoralists at increasing losses of stock.

In general these events were not well documented. Bolton, however, reveals incidents of imprisonment of children on cattle-slaying charges, and rough-shod methods of the police.

In 1902 the Ord River Station was purchased by Samuel Copely, a Perth real estate 'magnate' who had established his fortunes by pioneering the Perth suburb of Mt Lawley.

Consolidation of the bigger East Kimberley stations occurred during the early 1900s. By 1905 many of the big stations had reached approximately the same boundaries as they hold now. During the early 1900s, cattle tick, continuing conflict with Aborigines, lack of efficient killing or freezing facilities, and isolation contributed to the discouragement of some of the original pioneers (see Map 4).

In June 1914 Copely's runs, Ord River and Sturt Creek, which together included all but the northern parts of the Bungle Bungle massif, were sold to the Union Cold Storage Company.

Union Cold Storage was a British company controlled by the Vestey brothers, Sir William and Sir Edmund. The company ran a great number of small retail businesses throughout England and was affiliated to Weddel and Company, a leading London stock buying house.

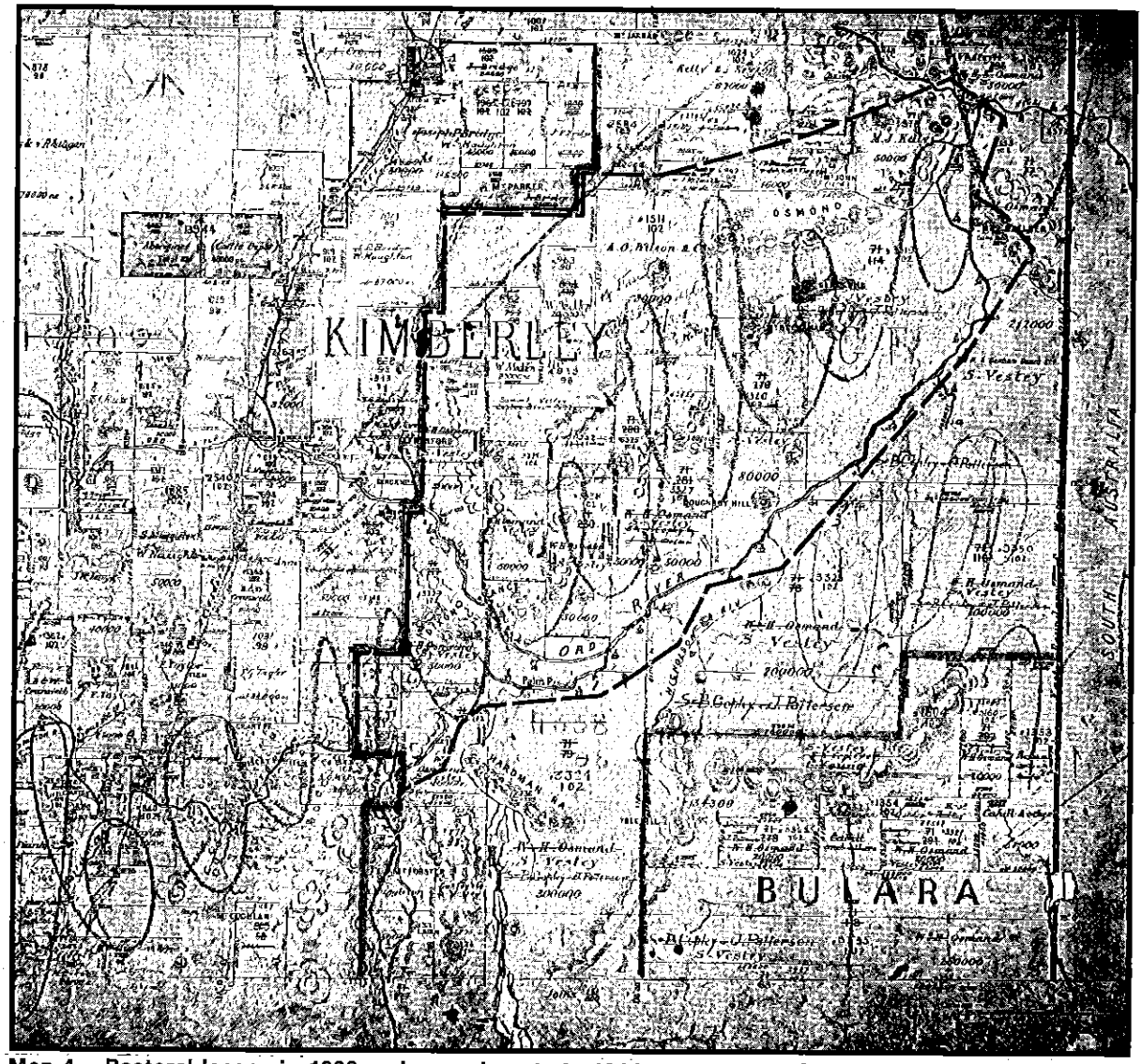
Within the next 12 months Union Cold Storage purchased several other pastoral leases in the Kimberley and amassed a total landholding of over 2.2 million hectares in the Kimberley and a similar area in the adjacent Northern Territory.

However, in 1917 the Western Australian Parliament passed an amendment to the Land Act, which meant that no one person could hold more than 1 million acres (405,000 ha) of land in any one division of WA.

In order to keep their interests, the Vesteys used 'a simple expedient' — they transferred various parts of their property to others (Bolton 1953).

On the face of it, the Ord River Station and Sturt Creek Station had become divided amongst several independent smallholders. However, all these 'smallholders' entrusted the administration of their properties to the Australian Investment Agency, a company set up in 1915 by the Vesteys to handle their Australian interests.

Subsequently (in 1921), the Vesteys divided their Kimberley property into seven stations, of which Ord River and Turner were two, transferring the leases to subsidiary companies. Each station had a homestead and resident manager. However, the managers were little more than 'caretakers'. They were not required to initiate their own programmes, or make any changes. This was done by the Australian Investment Agency on behalf of the shareholders.



Map 4 Pastoral leases in 1903 and amendments to 1914 — — **Study Area**

Under the open range cattle production system operating in the Kimberley, cattle preferentially concentrated on the major river lines where they were initially sustained by the abundance of surface water and the productive pastures. The dramatic increase in grazing pressure, compounded by droughts, bushfires and feral animals was, however, sufficient to exceed the resilience of the ecosystem.

By the 1930s most of the more productive land along the Ord River was severely degraded and eroding.

The northern part of the Bungle Bungle massif and Osmond Range had a slightly different history. Being further from major rivers and poorer quality grazing land, they were not taken up in large leases by the wealthy landholders. The earliest recorded lease, of only 32,000 ha, was taken up by Wilson and Company north-east of the Bungle Bungle massif in 1902.

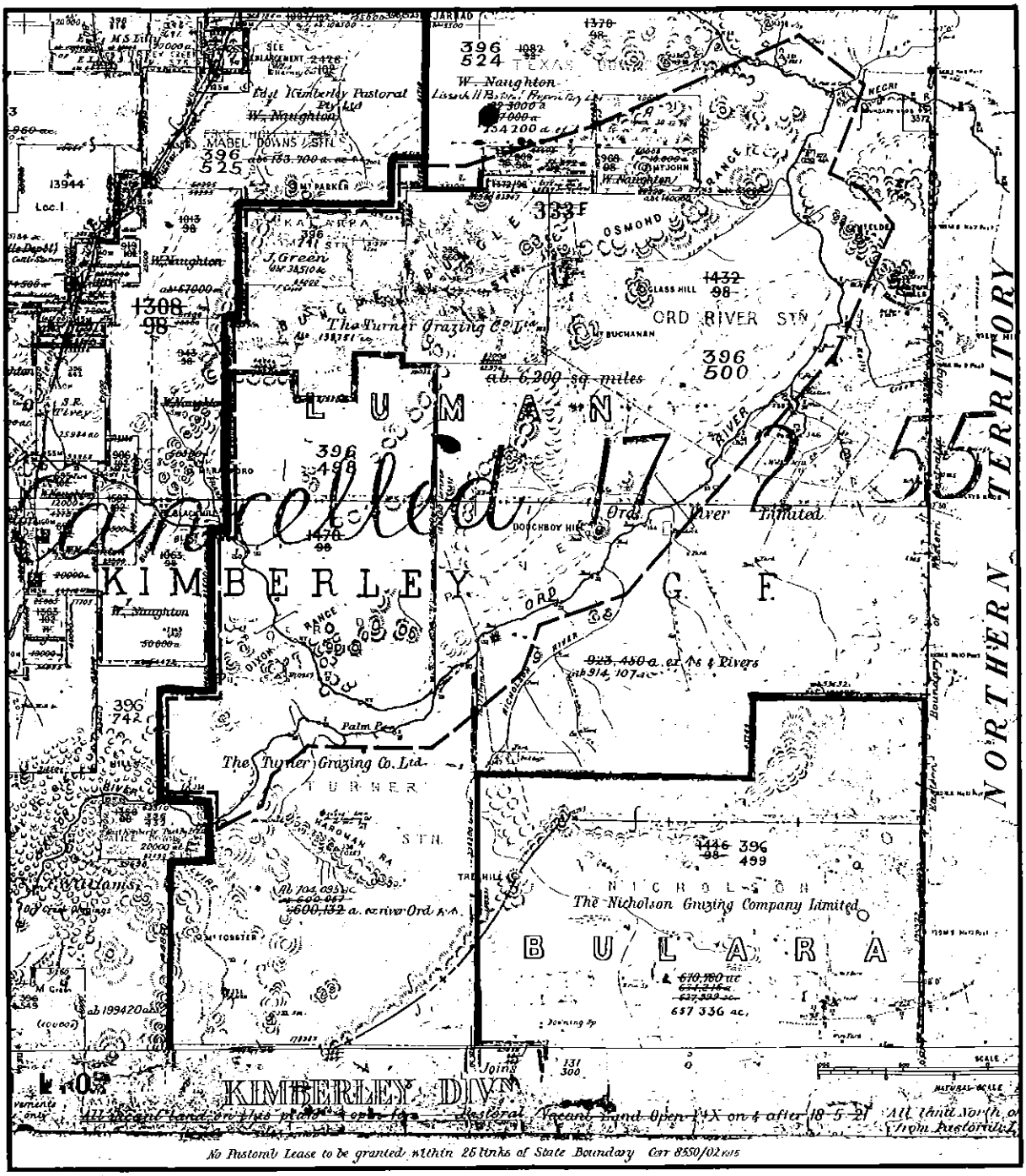
Bolton (1953), however, does not mention this station and it is possible that early owners were speculators. W. Madden took up two adjacent leases of 8,100 ha each in 1907, including the site of the Bungle Bungle outcamp, and in 1915 purchased a further 7,500 ha to the north-west of the massif.

In 1921, together with T. Brennan, he acquired the 32,000 ha lease originally taken up by Wilson and Company to hold all the lands along the northern portions of the Bungle Bungle massif. The Bungle Bungle outcamp to the north-west of the massif first appears on pastoral lease maps dating from 1923.

Madden and Brennan ran the station until 1934, when it was purchased by William Skuthorpe. Bolton records that Skuthorpe was one of a breed of 'battlers' — men who were 'accustomed to buying up an old station, working on it for a few years and then disposing it at a profit'.

In 1948 Bungle Bungle Station was purchased by the Vesteys (Turner Grazing Company) (see Map 5). The lease was amalgamated with that of Turner Station in 1966.

The Vesteys' companies — Turner Grazing Company Ltd and Ord River Ltd, were in possession of Turner and Ord River Stations until 1967, when both were resumed by the Government, together with other areas, and reserved to facilitate the regeneration of the by now severely eroded lands in the Ord River Catchment Area.



Map 5 Pastoral leases 1945 and amendments to 1955 —— **Study Area**

3 KEY ISSUES

3.1 Introduction

Based on its assessment of the Study Area's natural resources, past and present landuses and Aboriginal associations with the area, the Working Group has recognised five key issues which should be considered in determining the future landuse and management options for the area. They are as follows:

— Conservation of biotic and landscape resources;
— Aboriginal interests (cultural, social and economic);
— Tourism;
— Mineral exploration; and
— Soil and vegetation rehabilitation requirements.

The question of pastoral usage of the Study Area was also considered but rejected as being inappropriate even though the entire area was under pastoral lease in the past. The majority of the Study Area is considered poor pastoral land, being either inaccessible mountainous country or waterless sand plains supporting vegetation types which are largely unpalatable to cattle. The areas of better grazing pastures along the Ord and Panton Rivers and valleys to the north and west of the Bungle Bungle massif are located on friable calcareous soils which are very susceptible to erosion when devoid of vegetation cover. Large areas have become severely eroded and degraded and are still in need of active regeneration programmes. The Department of Agriculture has made it clear that it considers pastoral usage of these lands to be both inappropriate and undesirable. Consequently, pastoral usage of the Study Area has been rejected as a key issue in considering future landuse and management.

3.2 Conservation Values

3.2.1 Background — The Conservation Reserve System in the Kimberley Region

The history of development in the Kimberley has involved the alienation of most of the land area to pastoral leases. The existing and proposed conservation reserve system reflects this prior commitment. Only a few, generally small, reserves represent land units which are desirable for cattle pasture.

The three existing large conservation reserves in the Kimberley, the Drysdale River National Park and the Prince Regent River and Point Coulomb Nature Reserves, are all in the northern and western Kimberley. Several small reserves of outstanding scenic, biological, geological or historic interest, notably Windjana Gorge, Tunnel Creek and Geikie Gorge National Parks, have also been set aside. These reserves represent special features rather than the widespread surface types of the region and therefore, do not serve to adequately represent or conserve the range of local flora or fauna types.

In the 1970's the Environmental Protection Authority established the Conservation Through Reserves Committee to evaluate and review the requirement for National Parks and Nature Reserves throughout Western Australia. The CTRC reported on the Kimberley region (System 7) to the EPA in 1973. Following a period of public review the EPA made recommendations to Government in 1980 (see Map 6).

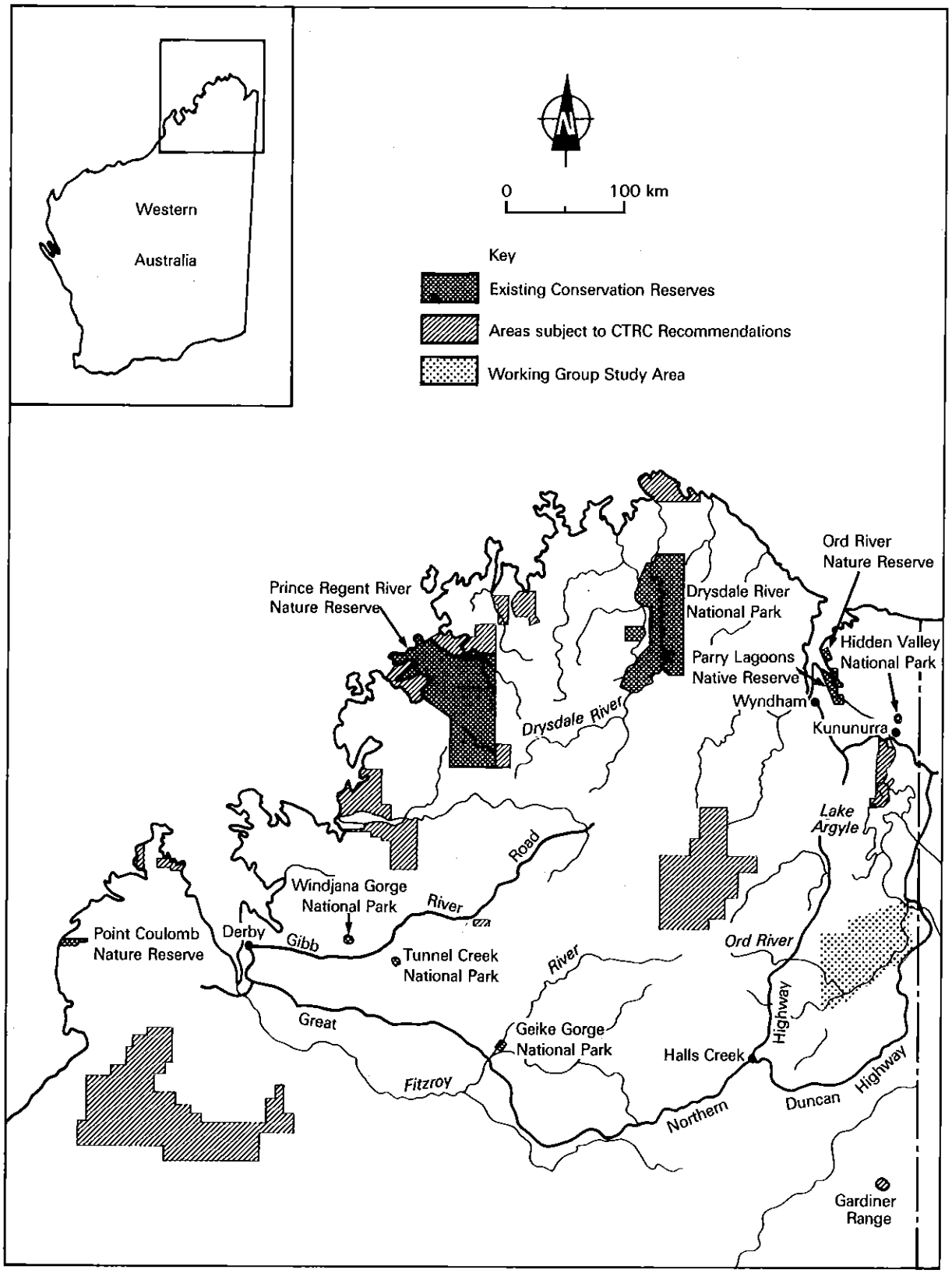
The CTRC noted that the existing reserve system failed to represent some parts of the Kimberley region at all and that some existing reserves did not fully represent the local environment.

The Committee's report made a number of specific reserve recommendations intended to help rectify these deficiencies. In developing the recommendations they were, however, constrained to a degree by prior commitment of lands to other purposes, notably pastoral use. As a result, the proposed reserve system is still deficient, particularly with respect to representation of areas with high pastoral potential, notably heavy alluvial plains and riverine areas associated with the major sedimentary basins of the Kimberley. No reserves exist or are proposed in the Ord Basin of the East Kimberley.

In specific reference to the south-eastern Kimberley the CTRC stated:

"An environmental survey should be made in the south-east Kimberley where there are no conservation reserves at present",

and went on:



Map 6. Existing Conservation Reserves and areas subject to Conservation Through Reserves Committee (C.T.R.C.) recommendations in the Kimberley Region.

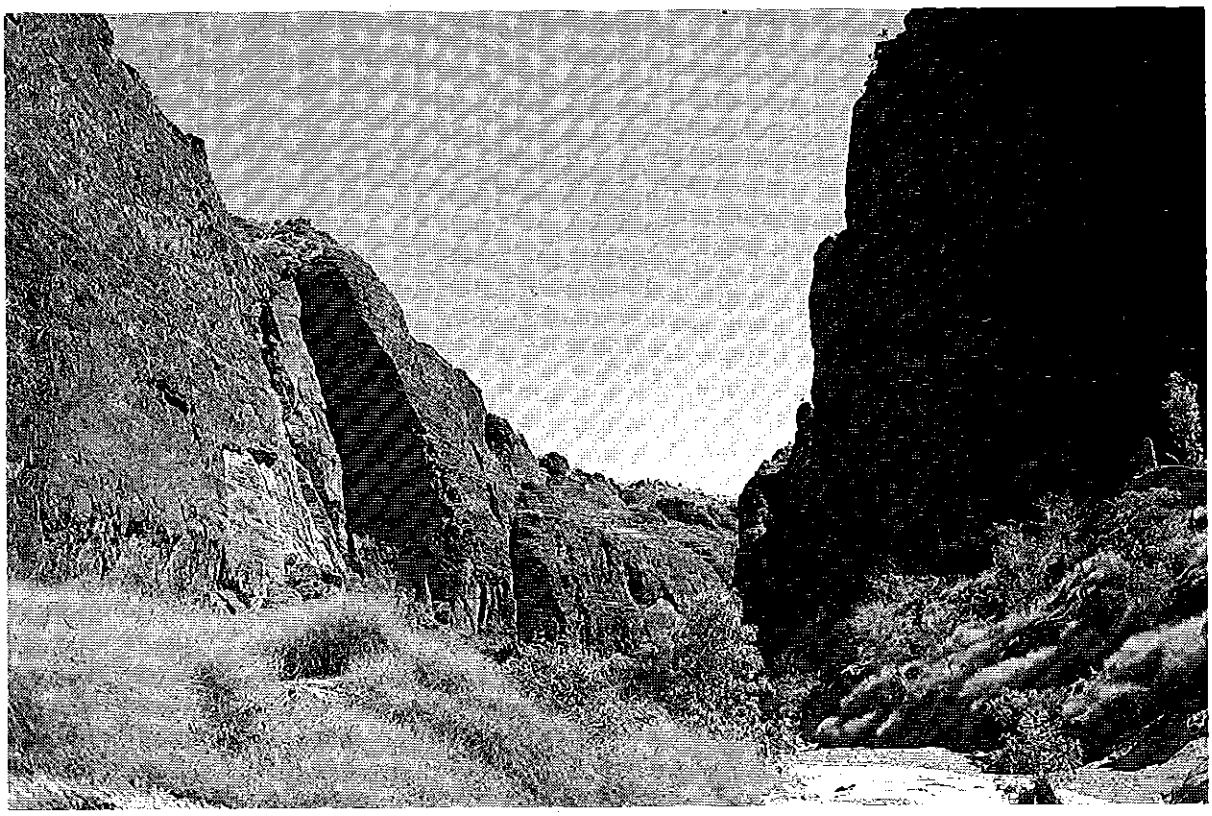
"In the Ord Valley a substantial reserve for the purpose of regeneration of eroded areas was set apart to ensure ultimate regeneration of grasses because of siltation dangers to the Ord Dam . . . the Committee believes that in due course the National Parks Authority should be involved in managing the area."

In its report to Government entitled "Conservation Reserves for Western Australia, as recommended by the Environmental Protection Authority System 7", the EPA noted the CTRC's concern that there were no conservation reserves in the south-eastern Kimberley. It also observed that the then recently released World Conservation Strategy pointed out the need to preserve areas of 'tropical grasslands and savannah', ecosystems which occur across the southern Kimberley region, because these ecosystems are unrepresented or poorly represented in protected areas throughout the world.

With a view to these issues the EPA recommended that a suitable area in the Gardiner Range, south-east of Halls Creek, (together with an area in the south-western Kimberley) be reserved should it become available. It is understood that the CTRC's comment referring to the regeneration reserve was not pursued further because the area was already reserved and managed by the Department of Agriculture for the specific purpose of regeneration and the diversity and scenic attraction of the terrain was not appreciated at the time.

3.2.2 Biological Conservation Values of the Study Area

Detailed biological survey information on the flora and fauna of the Study Area, and the South-Eastern Kimberley region in general, is very limited or non-existent. Within the Study Area there have been no fauna surveys undertaken and only limited flora surveys of parts of the Osmond Range and the Bungle Bungle massif. The absence of detailed surveys of the region means that, with few exceptions, it is not possible to consider meaningfully the biotic conservation significance of the species collected or habitats observed in terms of their degree of representation elsewhere in the region.



Piccaninny Gorge; strong structural control and failure of the valley sides along great joint-bounded fractures maintain large vertical faces. In these enclosed gorges Soft Spinifex *(Triodia pungens)* (foreground) exists in communities which are protected from frequent burning, a situation which is uncommon in the Kimberley region. Sheltered moist environments in the upper gorge support species of plants not found in the more arid plateau of the range, including numerous tall *Livistona* Palms, ferns and species of *Leptospermum* and *Stephania japonica* which have not been recorded elsewhere in Western Australia.

As a general comment it can be stated that sheltered moist habitats, such as occur in the permanently moist valleys of the Osmond Range and in sheltered positions within the narrow chasms of Bungle Bungle, are often of conservation significance, as they support specialized communities, are very restricted in their occurrence within the region and often provide refuge areas for species in times of drought. The enclosed gorges of Bungle Bungle may also be of significance as fire refuges containing long unburnt spinifex vegetation, an uncommon situation in the Kimberley.

The findings of the recent limited flora surveys of part of the Study Area support this comment in that several species of plants not previously recorded in Western Australia, or of very limited known occurrence, were collected, primarily from these moist sheltered habitats.

The habitats and plant species of particular significance recorded during the above mentioned flora survey and discussed by Kenneally and Forbes (in press) are as follows:

— The riparian (riverine) habitats of the Osmond Range and Valley are notable as the most south-easterly extension of such riparian forests reported in Western Australia. They also include two plant species of particular significance, *Euodia elleryana*, a tree recorded only twice previously in Western Australia, and Taro (*Colocasia esculenta*), a species of economic importance as a root vegetable throughout the humid tropics, but confined to a few localities in the Kimberley's.

— The Bungle Bungle massif, or more particularly the sheltered gorges within it, feature a flora which includes a number of significant components, notably:
  - a new species each of *Grevillea* and *Comesperma*;
  - the first recorded occurrence in Western Australia of four species; a fern *Taenitis pinnata*, a moss *Uleobryum peruvianum*, a scrambling vine *Stephania japonica* and a tree *Leptospermum longifolium*;
  - *Blumea pungens*, a species recorded on only one previous occasion; and
  - an undescribed *Livistona* Palm, considered to be of restricted distribution, but common in and characteristic of sheltered gorges in the massif.

— Winnama Gorge, north of the Osmond Valley, supports the best developed closed-forest stand recorded on the survey, with a considerably more diverse understorey than the riparian forests in the Osmond Valley. The site includes the only records in the south-eastern Kimberley of the ferns, *Blechnum orientale*, *Lindsaea ensifolia* and *Nephrolepis hirsutula*, an occurrence of the rare fern, *Psilotum nudum*, and the first record of the sedge, *Cyperus polystachys*, in Western Australia.

  The dry tree steppe vegetation surrounding the gorge is considered by Kenneally and Forbes to be equally as significant. It supports the second known population of an undescribed *Hibiscus* species, a species of *Josephina* and the first Western Australian record of an undescribed *Blumea*, previously recorded in the Northern Territory.

As previously stated no fauna surveys have been undertaken in the Study Area. Fauna surveys of nearby areas which are of general relevence to the Study Area have been undertaken by the Western Australian Museum in 1971 and 1972 (on the site of Lake Argyle); by the Chicago Field Museum of Natural History in 1976, (near the Lissadell Homestead area just south of Lake Argyle), both reported by Kitchener (1978); and a limited survey centred on the Argyle Diamond Mine by Harold (1982) some 20 km north of the Study Area. Surveys of the Phanerozoic sedimentary basins of the south-west Kimberley, (McKenzie 1981a and 1983) which are climatically similar to the Study Area and include similar substrates are also relevant.

McKenzie (1981b) draws comparisons between the mammalian fauna of the Phanerozoic basins in the east Kimberley and south-west Kimberley, noting the high degree of similarity. These results suggest that a reserve in the Study Area would also be of value in improving the conservation status of similar land surfaces in the south-west Kimberley, notably the alluvial surfaces which are elsewhere almost entirely contained within pastoral leases.

In view of the limited specific information on the area, the remainder of this section is confined to a consideration of conservation values on the basis of the ecosystems represented in the Study Area and the degree to which they are already represented in the conservation reserve system.

It is argued in the previous section that the present and proposed conservation reserve system is deficient in its coverage of certain elements represented in the Kimberley region. A large conservation reserve centred on the Study Area and incorporating a cross-section of land

units represented in the Ord River Regeneration Reserve would help to fill several significant gaps in the coverage of the reserve system.

Reservation of the Study Area would conserve extensive areas of tree savannah and tropical grassland ecosystems,and river systems which, as noted previously, are recognised by the World Conservation Strategy as being amongst the six ecosystem groups most critically in need of additional representation in protected areas on a world-wide basis.

A conservation reserve including the river frontage slopes and alluvial surfaces in the Ord Basin would provide for the representation of these landforms in the Kimberley conservation reserves system. Aside from these areas in the Ord River Regeneration Area, the productive alluvial and outcrop surfaces that occur in the Fitzroy, Joseph Bonaparte and Ord Sedimentary Basins can only be represented in conservation reserves through the purchase of pastoral stations(McKenzie 1981). Additional representation of these surfaces is needed if the conservation reserve system is to retain much of the natural biological diversity associated with these areas. Throughout the Kimberley these surfaces are being degraded by heavy and preferential grazing by stock and feral donkeys. The need to include representative areas in conservation reserves and actively rehabilitate them is thus a matter of some importance.

In the regional context such a conservation reserve would provide a nucleus for the conservation of the wildlife of the Ord Basin, would encompass some 140 km of the Ord River, one of the State's major river systems, and contribute to the representation of the south-eastern Kimberley in the reserve system. There are no conservation reserves representative of this region at present.

To conserve a reasonable array of the region's land units, thereby providing habitat continuity and heterogeneity and hence species richness, the conservation reserve should extend from and include the Osmond Range in the north and the Ord and Panton Rivers in the south with their associated alluvial and frontage surfaces. Regeneration of the latter, which are presently in a degraded condition, should constitute a high priority. This issue is discussed in greater detail in Section 3.6.

To maintain their biological diversity in the face of disturbances such as frequent wild fires, feral stock and other human influences, conservation reserves need to be of large size. The actual dimensions necessary will vary with the region concerned and its biological produc-

Arrays of sandstone towers, here seen in the north-eastern area of the massif, have come to be regarded as the characteristic landscape feature of the Bungle Bungle massif. The scale and complexity of their development, which can only be fully appreciated from the air, ranks this as the best example of sandstone tower topography in Australia and one of the outstanding examples of its type in the world.

tivity, in the same way that farming units range from small units of a few hundred hectares in the productive south-west through larger holdings in the wheatbelt, to very extensive pastoral leases of 200,000 hectares or more in the interior. For a reserve in the semi-arid south-eastern Kimberley area to maintain its diversity, because of the relatively low productivity and density of species, the long annual dry period, frequency of drought and the highly nomadic nature of much of the fauna, it is estimated that a minimum reserve size of approximately 2,500sq km is desirable (McKenzie pers comm).

3.2.3 Landscape Conservation

The Study Area contains a diverse array of landscapes, including the riverine flood plains of the Ord River, rugged cuestas associated with Elder Sandstone and extensive undulating Buchanan Sand Plains to spectacular strike ridges, hogbacks and cuestas of the Osmond Range. It is the array of towers, cliffs and narrow chasms of the Bungle Bungle massif, however, that forms the dominant feature of the Study Area.

A striking aspect of Bungle Bungle massif is the marked change in landforms which occur across it. The massed towers, gorges and isolates of the east and south-east give way to cliffs and domes as critical changes to the composition and jointing occur in the sandstones. The change is probably most abrupt along Piccaninny Creek, where the towers give way to the sheer cliffs of the main gorge tract. This change of form coincides closely with the appearance in the sandstone of quartz veins which are the result of metamorphic activity associated with the Piccaninny structure (Beere 1983). Here the rock is more resistant than the friable sandstone elsewhere, and instead of being carved up by minor channels, the valley sides fail along great joint-bounded fractures, thereby maintaining large vertical faces. The sheer cliffs, joint-bounded pinnacles, and the waterfalls of the upper tract of the gorge comprise remarkable scenery, which is made all the more impressive by the contrast to the tower complex downstream.

However the landforms of the Bungle Bungle massif are not just visually spectacular, they are also of national and international scientific significance. (R Young Pers. Comm.). Arrays of towers and narrow chasms such as this are usually found on limestones; Bungle Bungle is one of a relatively small group developed in sandstone.

Young (in prep.) writes that; "Sandstone towers occur on ancient shields in other parts of the world, notably in the Sahara. Yet the Bungle Bungle massif seems unrivalled in the complexity of its tower terrain and certainly in the clear evidence it gives of the importance of ancient weathering regimes in the shaping of sandstone landscapes."

Jennings (1983) records that in Australia these landforms which he refers to as 'ruiniform' relief, occur in the Kimberley,parts of the Northern Territory and Queensland. In the Kimberley region they are evident, though not well developed, at Hidden Valley National Park near Kununurra, the Ragged Range and just across the Northern Territory border in Keep River National Park, where they are somewhat better developed. The landforms at Bungle Bungle, however, are larger, more extensive and more complex than other major Australian examples, such as the Ruined City of Arnhemland (which Jennings (1983), apparently without knowing of Bungle Bungle, considered the best example in Australia) and rank as one of the most outstanding examples of this terrain in the world. (R Young pers. comm.).

The relative rarity of sandstone erosional features of the type represented by the Bungle Bungle massif, together with the scale, variety, spectacular visual impact and virtually pristine condition of this example, qualify it for a high level of conservation protection as a feature of considerable scientific, and outstanding landscape value.

3.3 Aboriginal Interests

3.3.1 Background

The Ord River area and its surrounds are not well described in the anthropological literature. Pioneering research of the 1920s and 1930s remains today one of the more substantial sources of information on the people of this region.

Recently, however, research by Kirkby and Williams (1984), Christensen (1983), Rose (1984) and Scarlett (1984) which was targeted specifically on those people of the Warmun community who are traditionally associated with the Bungle Bungle area, has helped to fill in some of the gaps in this knowledge.

The anthropological information presented here is largely based on the research undertaken by these people and is thus heavily biased towards the Warmun Community people. It is recognised that these are not the only people with traditional claims to the area. Further anthropological research will be necessary to identify the remaining traditional owners.

Though much remains to be researched, this preliminary work demonstrates clearly that the traditional owners to this area (based on the example of those in Turkey Creek) have maintained a strong ongoing interest in traditional beliefs and values, despite gross disruption to traditional lifestyle since European settlement of the Kimberley region.

3.3.2 European Occupation

The East Kimberley was one of the last regions of Western Australia to be opened up for European settlement. The first pastoral leases were not established until the 1880s, following exploration of the Nicholson Plains, Upper Ord and Negri River areas by Alexander Forrest in 1879. By 1900 all the good pastoral lands along the Ord River had been allocated to pastoral leases.

Scarlett (1984) records that during the early phase of settlement Aboriginal camps were attacked and dispersed when they were seen as a threat to pastoral occupation or in retaliation for cattle spearings. Aboriginals were often forced into the relative safety of the ranges. During this period Bungle Bungle massif was used as a safe refuge. Scarlett was told of one place where access to the Bungle Bungle plateau was gained by climbing up notched tree trunks, which were pulled up after the ascent to prevent pursuit.

There are Aboriginal people alive today who witnessed the devastation, violence and repression accompanying the establishment of European control over this region (Christensen 1983). They vividly recall the cruelty and violence associated with these times and the inter-tribal tensions and fights that arose from disruption of the prior patterns of land occupancy and movement.

Elkin (1932) estimates that in the first 40 years of European occupation of the East Kimberley the Aboriginal population had fallen by some forty to fifty per cent, with some groups suffering even more. Such things as security, independence, control, pride and self-esteem, which were so obviously undermined in this process, defy quantification.

Pastoral occupation of their traditional lands, the associated heavy stocking of areas around water supplies and destruction of game resources displaced Aboriginal people from their traditional lands. Many Aboriginal people were subsequently forced by circumstance to work on pastoral properties during the dry season, often being laid off during the wet season to largely live off the land using traditional resources. Aboriginal social life, including large gatherings beyond a given station, was carried on during this seasonal period of release from European labour requirements. Aboriginals alive today once lived in limestone rock shelters near the Bungle Bungle outstation whilst working on the station.

Many people with traditional affiliations to this area worked in adjacent pastoral leases, being paid in kind, until 1968. Communication with people at Turkey Creek reveals that Aboriginals supplied the labour that built the early station roads into the area, and the early improvements to the pastoral properties, using rudimentary tools. Following the introduction of the Pastoral Award this employment largely disappeared; Aboriginal people were forced off or walked off pastoral stations throughout the Kimberley.

Traditional owners of the Study Area were dispersed to a wide range of towns, stations and Aboriginal camps. Many settled on the then small police reserve at Turkey Creek, along with groups from other areas. Today people accepted by the Aboriginal community as traditional owners to this area are known to reside (along with groups from other areas) in the following places: Balgo Hills Community, Bow River Station, Bullo Community, Chinamens Gardens, Halls Creek, Katherine, Kildurk Station, Mistake Creek, Nicholson Station, Oombulgurri, Warmun Community and Wave Hill Community.

As a result of these historical factors, the Warmun Community, for example, consists of Aboriginal groups drawn from a wide area and includes people from groups that traditionally do not mix. With approximately 250 residents, Warmun is a large community by Aboriginal standards, very much exceeding the habitual size of Aboriginal residential groups. This combination of factors results in a community that is to a greater or lesser extent factionalised and fraught with social problems.

3.3.3 Land Owners and Principles of Land Tenure

In Aboriginal systems of land tenure a number of rights of ownership and land use exist concurrently. Rights are based on descent. To be true to the traditional ideal there must be continuity. Descent from a parent or grandparent constitutes the most generally accepted basis for claims to rights in land. It would appear that in early days patrilineal descent was pre-eminent in this respect. Now, however, matrilineality has come to be almost as important. Christensen (1983) records that this is a process which has been under way for some considerable time. Kaberry (1939), for example, writing in relation to this part of the East Kimberley, reported that Aborigines maintain a claim to their mothers' country, referring to it as 'half-country'. She remarked that even then men and women were growing up in their mothers' country and coming to regard it as their own. More recently J and K Wilson (1982) refer to a strengthening of the "maternal line in inheritance" enabling "continuity in land succession".

Rights associated with descent are critical; however, this in itself is insufficient qualification to gain acceptance of claims within the Aboriginal community. Other ties to the land, such as the location of conception sites, places of birth, death and burial of important relatives, are important. Also important are the claimant's revealed attitudes to the land and its custodianship. Christensen (1983) reveals that factors considered here are ritual maturity, knowledge of relevant mythology and associated ritual, acquaintance with major sites and site complexes, possession of sacred objects and continuity of interest in the area. This pattern is consistent with that observed elsewhere in Aboriginal culture, as evidenced by Peterson, Keen and Sansom (1977).

It should be recognised, however, that the areas claimed by groups, referred to as estates by anthropologists, are defined by geographical and ecological features. Thus, as Kirkby and Williams (1984) record, while they may be defined in relation to major landscape features, the degree to which surrounding plains are similarly demarcated varies: the precision of boundaries relates to the need to be precise. Boundaries are made precise when there is a need to do so. Decision-making in relation to land, in a society without recourse to surveyed boundaries, thus involves consultation, negotiation and at times dispute prior to agreement.

The Study Area is larger than that claimed by any single local group.The area around the Bungle Bungle massif is claimed in part by Mr Wallaby. Aboriginal people at Turkey Creek acknowledge Mr Wallaby and his family as possessing primary rights of ownership for an area of country whose present-day focus is the old Bungle Bungle outstation. A number of other people are also recognised as having traditional interests in the Bungle Bungle region.

Mr Wallaby's primary claim is recorded by Kirkby and Williams (1984) and Christensen (1983) as deriving from his maternal grandmother, Kemintul, a woman born and brought up in this area and buried there as well. It passes to him through his mother's brother, Juwiwirriny, and his mother, Jalpart. His claim is further strengthened because his maternal grandfather is buried nearby at Osmond Valley Station and his *jirle yinginge* (translated as 'bush name' or 'country name'), Tilmarring, is an area of mythological importance located near the Bungle Bungle outstation.

The claim is further strengthened by the fact that Mr Wallaby is recognised by his fellows as being suitably equipped to discharge responsibilities toward the land, and to play a further part in handing it on to succeeding generations.

Claims on adjacent areas within the subject area, on behalf of the Turner and Oakes families, are known to be derived from a similar basis.

3.3.4 Aboriginal Relationship to Land in the Study Area

For Aboriginal people in the East Kimberley today their traditional lands and people's affiliations and associations with their traditional lands,or country, provide much of the fabric of everyday life. This has remained so despite the fact that most Aboriginal land has long since been appropriated and most of the original land-owning groups severely disrupted, if not entirely destroyed. Aborigines in this region, in common with Aborigines in many other areas of northern Australia, believe that their traditional social, economic and ritual life was ordained during the creative period of the Dreaming. Kirkby and Williams (1984) recorded that the Dreaming is both a contemporary actuality and the origin of a taken-for-granted set of rules by which people order their relationship with one another and with areas of land. People's rights in land are believed to have been ordained in the Dreaming.

Much extant religious belief amongst the Kija people at Turkey Creek, as interpreted by Kirkby and Williams (1984), consisted of complex and intricate sets of statements about people's economic relationship with the land, couched in spiritual and metaphysical terms. The beliefs that make a place or an area important to Aboriginal people are derived from a wide range of social requirements that constituted the economic and social necessities of a former hunting and gathering group who had certain rights to defined stretches of country.

To a considerable extent Aborigines order their social and economic affairs by the exercise of these land-based religious beliefs. The destruction, or threats of destruction, of land sites may thus threaten their ability to order their social, cultural and economic relationships. It is clearly quite wrong in this context to view so-called 'sacred sites' as existing in a vacuum outside all social economic activities of the community.

The Study Area has been far from fully surveyed for Aboriginal sites. The preliminary research carried out to date by Kirkby and Williams (1984), however, indicates that the intensity of names on the landscape, that is names of features, sites, evidence of activities of Dreaming characters and evidence of activities of human predecessors of living traditional owners, is comparable with other areas in the general region.

Christensen (1983) also recognises the following important points:

"Aboriginal people are also looking to the land to provide an economic-territorial basis for community life. Perhaps in much popular discussion this aspect has been neglected with the overwhelming emphasis being given to questions of sacred sites and the spirituality of the landscape";

"While deeply committed to the spiritual custodianship of their land, they are also looking towards restoration of secure economic and territorial bases for the communities they hope to build".

3.3.5 Aboriginal Concepts and Classification of Features in the Study Area

Kirkby and Williams (1984) found that sandstone and metamorphic outcrops, which rise above the Ord River plain to dominate the landscape in this area, are common references when the Aboriginal people speak about places and country in the region.
The Kija (local dialect) terms used to identify these features correspond reasonably with English-labelled lithological types, although traits other than the geological composition of the features also figure in the way Aborigines perceive and label this environment.

Some of the Kija terms speakers use to identify and clarify the country in the Bungle Bungle area,as recorded by Kirkby and Williams (1984), are set out below.

Terms	Approximate English Equivalent	Lithology
punululu	'sandstone'	white friable quartzite sandstone which surface weathers red and pink
ngarrkurru	'red rock'	red siltstone, quartzite, quartz conglomerate, quartz sandstone and fine sandstone
minjiwurr	'limestone'	limestone, dolomitic shale and dolomite (calcareous rocks)
pulurr	'crumbly'	ferrugineous micaceous sandstone and siltstone
Kewalu-walu	'small hills'	various metamorphics forming rugged hills

When used as nouns a (masculine) suffix, either -(u)ny or -ji is attached to these terms as in for example Punululuny and Minjiwurrji.

These terms are used to describe physical features or complexes of features in a generic sense rather than specific localities. Thus, in order to avoid confusion or ambiguity, terms such as these appear to be used in conjunction with a primary term which refers to a unique or outstanding feature associated with the particular area. For example, the Bungle Bungle massif is called Punululuny. However, when people wish to refer to that area specifically, Kawarra, a Kija word which is translated as 'cliffs you can't climb up', is used in conjunction with Punululuny. Kawarra refers to the numerous vertical-sided ravines of the Bungle Bungle massif.

3.3.6 Traditional Living Areas

The traditional owners living at Turkey Creek and in associated communities are riverine peoples. Although their traditional lands included plains and hill country, rivers and features associated with rivers are important in the way they have conceptualised their environment. Rose (1984), in preliminary research carried out in the Bungle Bungle area with traditional owners, identified three major types of living area. The first type consisted of rock shelters in both sandstone and limestone. The shelters shown were all small and had been used by small groups, primarily family groups. People are said to have scattered themselves through an area, small groups camping separately but at no great distance. These shelters were used primarily during the wet season when protection from rain was required.

From the shelters, people would forage onto the plains and up into the gorges. Land animals, fruits and vegetables and native honey were the primary resources utilised during this period of the year.

Living areas associated with permanent water holes constituted the second type. The specific sites chosen were open areas above the flood level. Permanent waterholes yielded a great variety and quantity of foods from both water and land sources. Major food items included fish, crocodile and turtles; land animals such as kangaroo and emu; fruit, vegetables and native honey.

Rose was told that these sites were also used during the wet season. While this has apparently been the case in living memory because this was the only season available to Aboriginal people to conduct their own economic, political and religious life, she thinks it probable that in pre-contact times these areas may have been used primarily during the early dry season. The particular significance of these sites is that they enabled, by their open nature and available food resources, large numbers of people from different language groups to conjoin for purposes of regional social interaction including exchange, dispute resolution and ceremony. These large multi-language assemblies have continued to the present time and constitute an essential part of Aboriginal economic, political and religious life.

A number of sites of this type were shown to Rose. One such site had been used in recent memory to put a young man through the first stages of male initiation. This ceremony had brought together people from at least four language groups. Surface scatters of stone points testified to the antiquity of some of these sites.

The third category of living area is the tops of the ranges. These areas had not been used personally by any of the people with whom Rose worked. They were said to have been used both in pre-contact times and during the early decades of contact, when they were used as refuge areas. Rose reports having been shown several areas around the Bungle Bungle massif where Aboriginal people used to hide from Europeans, including the area referred to by Scarlett (1984) (on page 30) where they apparently used makeshift ladders which they pulled up after them.

3.3.7 Botanical Resources, Their Use and Management

Kirkby and Williams (1984), Rose (1984), and Scarlett (1984), all record that the traditional owners of the Bungle Bungle area with whom they worked have a very considerable and detailed knowledge of plant resources.

Scarlett spent two weeks with the Kija people at the Bungle Bungle outcamp in July 1984 and compiled an extensive record of the ethnobotanical knowledge of the people. He recorded 24 species of edible fruits, leaf and edible gum foods and the collection of wild honey and lerp scales. The respective uses of 16 species of medicinal plants and a wide range of trees and shrubs used in implement-making were also related to him.

Scarlett records that despite all the disruption and changes consequent on the European presence the persistence of the association between people, their land and the environment is reflected in the detailed practical knowledge of base camps, associated resources and their locations, their seasonal availability, preparation and storage.

The short study of two weeks was only successful, he notes, because the informant group were thoroughly familiar with their country and its resources and planned the survey strategy accordingly.

Rose's findings corroborate those of Scarlett. She found that extant knowledge includes types of plants and their uses; methods of storing, cooking and detoxifying foods; locations, seasonality and ecological inter-connections between plants, animals and seasons. Knowledge is not limited to human use, but includes a detailed understanding of the resource bases of animals as well. The breadth of information also encompassed the use of plants as technological items and as medicines. Rose records that prior to contact Aboriginal people had developed strategies for managing the environment in such a way that it was maintained as a system that would produce sufficient resources for all. They recognised the inter-connections of species through food chains, understood the actions of the seasons on resources and intervened in ecological relationships through the use of fire, selective gathering and hunting, food taboos and religious ritual. Rose records that both the women and men are well aware of and deeply concerned by the depletion of these resources. They have indicated that they would hope to fence areas off to allow for and monitor the regeneration process.

The cultural and ecological knowledge these people possess would enable them to provide valuable input into park management and park interpretation for visitors, should proposals for a national park in this area come to fruition.

3.3.8 Attempts to Return to Traditional Lands

The traditional Aboriginal owners have long expressed the desire to return to their lands. The first attempts by Aboriginal people to regain title over land encompassed by the Study Area are understood to have been made at a Land Rights Conference in Darwin, in 1972.

In March 1981, representatives from the Warmun Community attended a meeting with the then Minister for Lands in Kununurra to seek his approval for title for the area, to be vested in the traditional owners. The Warmun Community, also in March 1981, approached the Aboriginal Lands Trust, requesting them to seek title to this area, and shortly thereafter, wrote to the Minister for Agriculture, seeking his support for the area to be vested in the traditional owners. Letters were also written to the Ministers for Land and Community Welfare at this time. Several further attempts to put their case to Government culminated in a letter to the present Minister for Community Welfare, with special responsibility for Aboriginal Affairs, in March 1983. The response to this latest letter indicated that consideration of these issues would have to await the outcome of the Aboriginal Lands Inquiry.

More recently a number of traditional owners have begun living and establishing an outcamp near the old Bungle Bungle outstation. Their actions, in choosing to live in this remote and isolated area with no facilities, demonstrate the extent of their desire and determination to start up a traditionally-based community, on traditional land. It also reflects the desire to escape the problems of living in a centralised community, on government handouts and welfare payments. This dependency and the severe living conditions have a demoralising effect on the community, which is highlighted by problems associated with alcohol abuse and other social and health problems brought about by the social and living conditions.

3.4 Tourism

3.4.1 Tourism in the Kimberley

The Kimberley region is a tourist destination of increasing importance and was so prior to the media promotion of Bungle Bungle. Its attraction lies in the magnificence of the scenery, notably national parks such as Geike Gorge and Windjana Gorge, attractions along the Gibb River Road, the potential for relaxation, fishing, swimming, boating in natural surroundings and the attractions of a warm, sunny winter climate.

The value of tourism to the Kimberley region was conservatively estimated by the Australian Bureau of Statistics at $15.86 million in 1982. This figure does not take into consideration expenditure by resident hosts or day excursionists. The WA Tourism Commission estimates the value of tourism to the Kimberley in 1983 at $20.6 million.

Arrivals to tourist accommodation as provided by the Tourist Accommodation Survey conducted by the Australian Bureau of Statistics reflect an increasing tourism interest. In 1982 145,000 arrivals were recorded continuing an average 10% annual growth rate evident since 1977. On these figures, without allowing for any other influence, the total visitor numbers to the region could be in the order of 180,000 for 1984.

The influx of visitors to the Kimberley is highly seasonal, with approximately 70% of the arrivals occurring during the six months April to September during the cooler months of

the dry (winter). Despite effort in recent years to promote travel to the region during the "Green Season', this concentration of arrivals into one half of the year has not changed since 1977 (72% in 1977 and 71% in 1982). (See Table 4)

Table 4 Visitor Arrivals Kimberley Region 1982(1977)

	Arrivals in 1000s				
	March	June	September	December	Year
Caravan Parks	6.5 (3.7)	23.8 (18.1)	33.4 (21.0)	12.9 (6.5)	76.6 (49.3)
Hotels/Motels & Guest Houses	9.3 (5.1)	18.2 (10.3)	28.1 (14.4)	13.4 (9.9)	69 (39.7)
Total Arrivals	15.8 (8.8)	42.0 (28.4)	61.5 (35.4)	26.3 (16.4)	145.6 (89)
% of Annual Arrivals	10.9 (9.9)	28.8 (31.9)	42.2 (39.8)	18.1 (18.4)	

(Source Australian Bureau of Statistics)

The seasonality reflects primarily climatic considerations. While tourists travel north to soak up the sun during the southern winter months, most are less inclined to travel to the region during the very hot and humid months of the northern wet. Access difficulties associated with the 'wet' are also a significant factor, restricting or preventing access to many of the region's most popular attractions.

Improvements to the all-weather road system in recent years have resulted in more visitors in the late wet months from February onwards. Despite this the high degree of seasonality remains as one of the main problems facing the industry in this region.

Approximately 50% of visitors travel by private car (WA Tourism Commission) and for them the unsealed section of the highway between Fitzroy Crossing and Halls Creek is an impediment to wet season travel. Work is progressing on the construction and sealing of the final 275 km section of unsealed road. Once it is completed in 1987, it is anticipated by the WA Tourism Commission that there will be an approximate 20% increase in visitor numbers to the region.

3.4.2 Tourism Interest in Bungle Bungle

Though the existence of the Bungle Bungle massif was known locally, it was only recently discovered by the wider public and tourism interests following the widespread media coverage in late 1982 and early 1983, initiated by the "Wonders of Western Australia" series.

Despite relatively little official promotion of the area, it has already generated interest to the extent that most tourists to the East Kimberley region want to include it on their itinerary. This degree of interest may be attributed to several factors. Most importantly, it is a feature which though not unique,as is often claimed, is certainly unusual, spectacular and highly distinctive. However, the exotic name, the relative remoteness and spectacular manner in which the area was first "discovered" by the television cameras and subsequent newspaper reports may also have contributed to the level of interest.

Access to the area by vehicle is difficult, particularly if the visitors' intention is to reach the areas which have been featured extensively in media coverage and have come to be regarded as the characteristic Bungle Bungle landscape. The rough pre-existing tracks which reach to within a few kilometres of the massif were constructed for mineral exploration purposes and were not intended to withstand continued use or to serve any lasting purposes. Accordingly, their routes were not surveyed to identify the most appropriate alignment with respect to ease of access or long term stability. Beyond the mining tracks tourists and tour operators intending to reach the desired features have traversed fragile eroding lands and forced an access across country for a number of kilometres.

While it is unlikely that a few vehicles would cause much lasting damage, the Working Group is concerned that if the area is promoted and large numbers attempt to gain access to the area, there is the potential for more serious degradation and the establishment of access routes would place constraints on potential management options and add unnecessary costs

for rehabilitation. The concern was also expressed that in the absence of any management, visitors may damage areas or features of importance to the Aboriginal traditional owners.

In this context the Working Group drafted an interim recommendation:

"That until such time as the status of the 'Bungle Bungle Range' and its surrounds is determined and management capability exists, tourist access to the area and the promotion of its features should be discouraged in the interests of achieving the best long-term land use for the area."

This recommendation was accepted by the EPA and subsequently by Government.

It is difficult to assess the numbers of people that have attempted to drive to the area in any quantitative sense. The numbers have, however, been relatively small; certainly far fewer than would be the case if the features of the area had been freely publicised. To this extent the interim policy is considered to have been successful thus far. However, it is understood that the number of visitors attempting to drive to the area was increasing towards the end of last tourist season and it is unlikely that a policy of discouragement would achieve the same degree of success in 1985.

In the past year Kununurra-based air charter companies have experienced a 600% increase in business (WA Tourism Commission pers. comm.). This is attributable to air charter work associated with the Argyle Diamond Mine and to scenic flights with Bungle Bungle as a primary destination. Of all scenic flights, 80–85% are the long duration flight taking in Bungle Bungle and other major features such as Lake Argyle and the Argyle Diamond Mine en route. This combination of three major features in the East Kimberley, none of which is readily viewed by vehicle access makes this tour a very attractive package.

The potential for aerial tours over Bungle Bungle is considered to be high because it facilitates year-round tourist access to this area and presents tourists with a complete perspective which is not attainable from the ground.

3.5 Mineral Exploration

3.5.1 Mineral Potential of the East Kimberley Region

The Eastern Kimberley region contains many areas with high mineral potential and there is currently extensive exploration activity seeking a wide range of minerals. The discovery of a large diamond-bearing kimberlite south of Lake Argyle has resulted in the first major mine developed in the region. It has also triggered very extensive diamond exploration work over a wide range of rock types.

The Halls Creek Mobile Zone is currently being explored for gold and base metals. A number of previously worked gold mines in the Halls Creek area have been reopened or are being reassessed due to higher gold prices.

Silver, lead and zinc mineralisation associated with Devonian carbonate rocks is being explored at a number of locations in the region.

Copper mineralisation has been recorded in a wide range of rock types of both Proterozoic and Palaeozoic ages. A number of these occurrences are the subject of further investigation, but to date no economic ore bodies have been found.

3.5.2 Mineral Potential of the Study Area

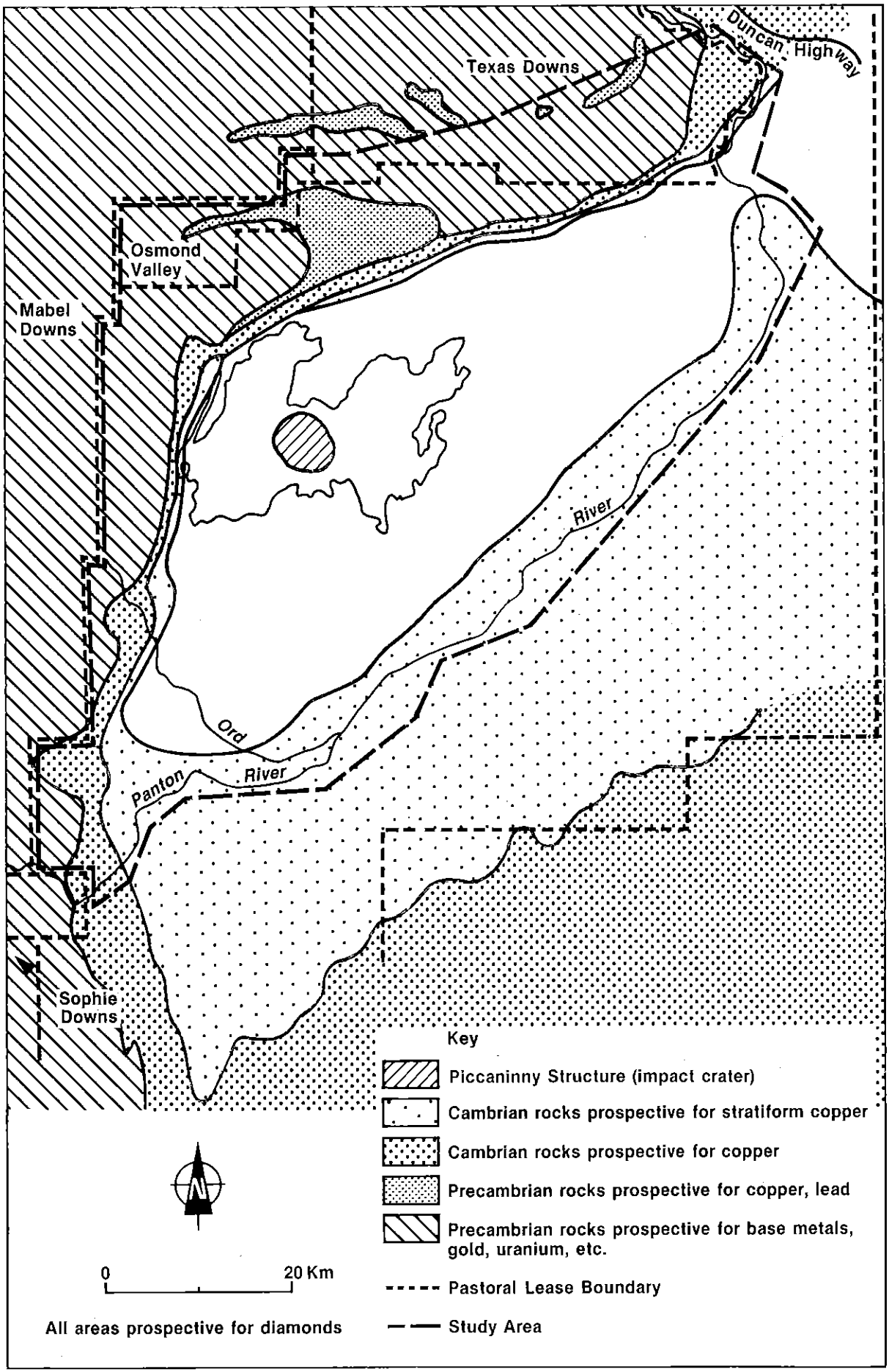
The Bungle Bungle massif is composed of fluviatile sandstones and conglomerates of Devonian age which are considered to have generally low potential for mineral exploration (the only mineralisation known from these sandstones is a shear-related copper occurrence at Mount Elder some 50 kilometres to the north-west).

Surrounding the sandstones of the Bungle Bungle massif, however, are a number of units which may be of economic potential.

Map 7 shows the prospective areas for mineralisation in the subject area. The Negri Group, a sequence of Cambrian limestones, shales and siltstones, contains evidence of stratiform* copper mineralisation in a number of places and will doubtless be subject to further investigation.

The Cambrian Antrim Plateau Volcanics contain copper mineralisation, including native copper, in a number of places, and have been investigated by a number of mining companies.

* Stratiform: composed of layers corresponding to rock strata.



Map 7 Prospective areas for mineralization Source: Department of Mines

Perhaps the most significant potential presently known from the area is in the sequence of middle to upper Proterozoic sediments which outcrops to the north of the Bungle Bungle massif. Within these the Bungle Bungle Dolomite, in particular, appears to have considerable potential for stratiform* base metal mineralisation (Mineral Resources Report No. 164).

This area has been the subject of several exploration programmes and is currently being examined by a group of companies who have encountered base metal mineralisation in a number of locations. The potential of the area is such that exploration activity can be expected to continue.

The alluvial gravels of the Ord River and its tributaries have been shown by recent exploration work to contain anomalous gold values. The potential exists for the discovery of alluvial gold deposits in present or past river channel sediments.

It can therefore be seen that while the mineral potential of the Bungle Bungle massif itself is low, that of the surrounding areas is significant.

In view of this, any proposed change to the status of the Study Area which could adversly affect or restrict mineral exploration access should be limited to the sandstone range itself. However, in accordance with normal practice, mineral exploration elsewhere in the Study Area will be subject to proper environmental conditions in the event of reservation of all the land.

3.6 Rangeland Regeneration Requirements

3.6.1 Rangeland Condition

The regeneration programme developed on the Ord River Regeneration Reserve is designed to mitigate the siltation of the Ord River Dam (Lake Argyle). Although the reserve area encompasses less than one quarter of the Lake Argyle catchment area, it contributed a very substantial proportion of the silt load. Extensive work for the Department of Agriculture by de Salis (1982) has resulted in the delineation of the degraded areas (see Map 3).

The most degraded parts of the regeneration reserve occur on friable calcareous clay-loam to light clay soils formed on shales of the Negri Group in the Nelson land system. These soils are extremely dispersable and when not protected by vegetation are prone to severe erosion. They are widespread along both sides of the Ord River and on the isthmus between the Ord and Panton Rivers within the regeneration reserve and hence have contributed large quantities of silt to the river system.

Within the Study Area the heavy textured grey clays of the Antrim land system, formed primarily from outwash material from the Antrim Plateau Volcanics, are also extensively eroded and degraded. This soil type occurs to the north and west of the Bungle Bungle massif, though the former area is in a generally better condition than those elsewhere.

De Salis (1982) assessed the range condition of the reserve in 1981 in a series of traverses within each land unit. Soil condition was assessed in terms of the degree and extent of erosion, while vegetation condition was assessed as a function of basal cover and species composition. This gave a subjective assessment of range condition within each land unit, together with an indication of the proportion subject to severe erosion.

Table 5 shows the results of this survey. The Nelson land system, notably the Frontage plains unit with 46% in poor condition including 23% severely eroded, and the low Rises unit of the Antrim land system, recorded as having 37% in poor condition and 26% severely eroded, are clearly the areas of greatest concern. In this regard, it is particularly notable that de Salis considered the true condition of the Antrim Lowlands unit to be far worse than the figures indicated, as the traverses missed many of the extensively degraded areas within this unit.

The Buchanan, Wickham and Elder land systems, other than the Lower Slopes unit of the Elder land system, are rugged upland or sandplain areas characterised by vegetation unpalatable to stock and remain in very good condition. These areas combined constitute the great majority of the Study Area.

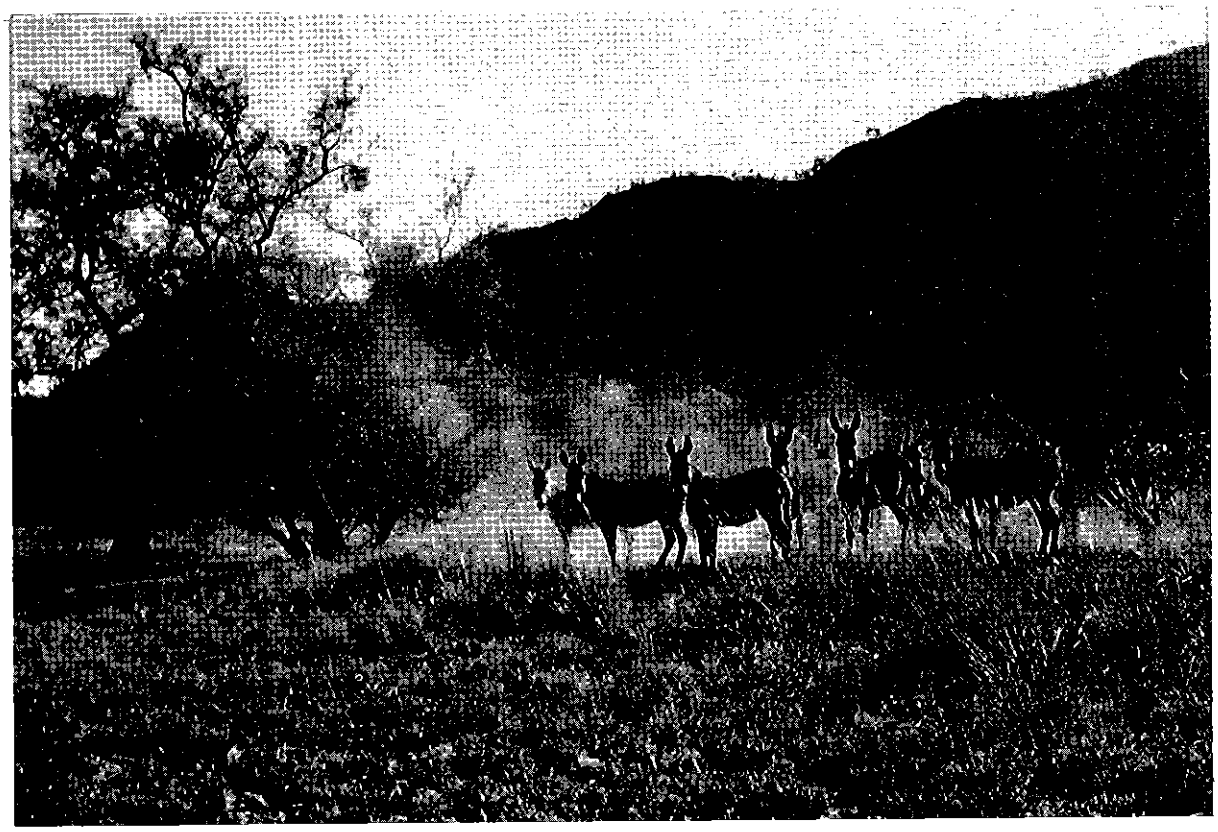
Generally the worst degradation has occurred on the most productive pasture land, the result of its easy accessability, proximity to water and the subsequent preferential over-use.

Conversely, the areas in best condition are usually distant from water and support unpalatable vegetation such as hard spinifex, acacia shrubland and spinifex open woodland pasture types.

Table 5 Summary of Rangeland Condition

Land System & Units	Proportion of Ratings: Good / Fair / Poor / Not Surveyed	Severely Eroded %
ANTRIM		2
Au — Rugged Uplands		0
Al — Lowlands		26
BUCHANAN		0
Bu — Uplands		0
Bp — Sand Plain		0
Bf — Frontage		0
DOCKRELL		0
Do — Rugged Uplands		0
ELDER		3
Eu — Uplands		0
El — Cuestas		0
Ep — Lower Slopes		16
HEADLEY		1
Hu — Upper Slopes		0
Hl — Lower Slopes		6
Hs — Cracking Clay Complex		0
NELSON		9
Nc — Cuestas		4
Nb — Cuestas Backslopes		1
Ns — Cracking Clay Plains		1
Nu — Interfluve Upper Slopes		4
Nl — Interfluve Lower Slopes		4
Nf — Frontage		23
Nr — Low rises		0
WICKHAM		0
Wk — Rugged Uplands		0

Source: Adapted from de Salis, Department of Agriculture Internal Report 1982



Donkeys and dust: The feral Donkey (Equus asinus) is very common in the valleys to the north and west of the Bungle Bungle massif. Control of feral Cattle and Donkey populations will be a necessary prerequisite before regeneration of eroded areas can occur.

The exception is the black soil plains (cracking clays) of the Nelson system, which are confined to the flood plain of the major rivers and are thus close to water and support palatable pasture but remain in generally good condition.

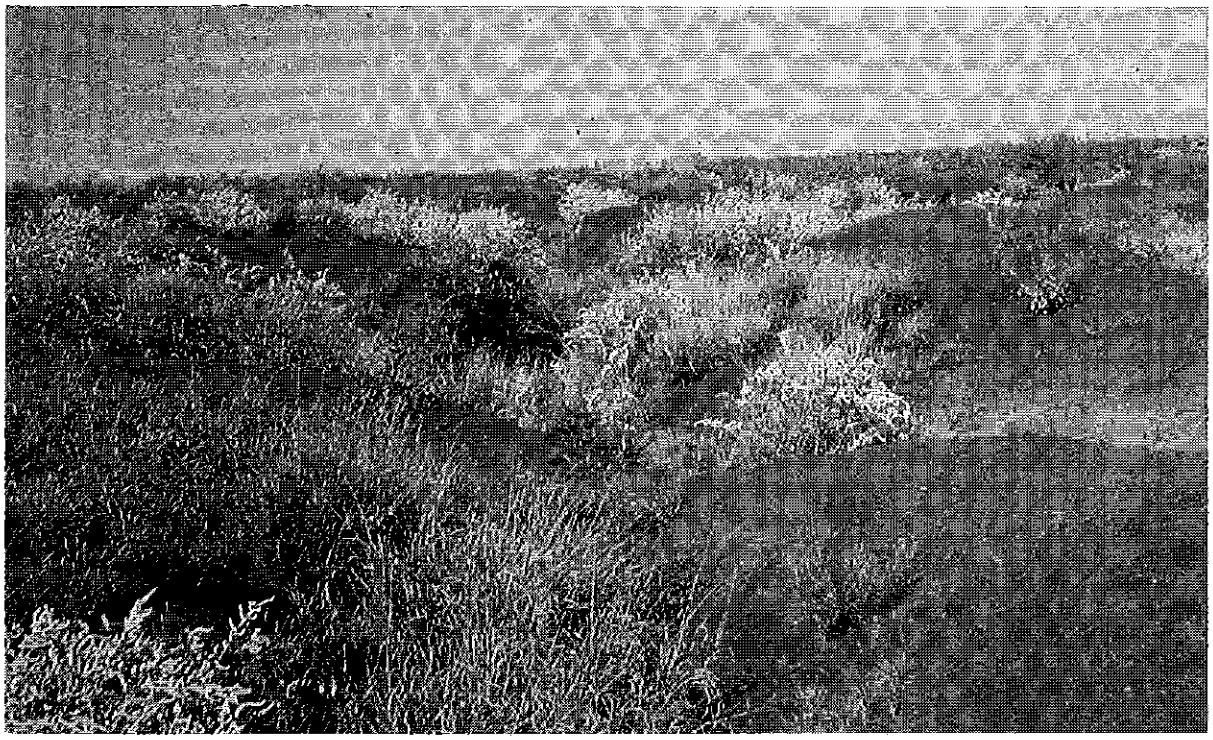
Within the degraded areas not only has the vegetation cover been greatly reduced, or eliminated, but where vegetation remains its species composition has been greatly modified. These changes have generally been at the expense of the more palatable native perennial grasses.

3.6.2 The Regeneration Programme

The rehabilitation programme adopted by the Department of Agriculture centres on the need to encourage the return of a perennial grass cover through the reduction, or if possible the removal, of grazing pressure and the re-establishment of vegetation by cultivation and re-seeding on denuded areas.

Fencing was recognised in the developing stages of the regeneration programme as being crucial for long term stock control. Accordingly most of the more productive country within the regeneration reserve was fenced into large paddocks during the 1960s. Initially, this fencing programme was to aid the total removal of stock from areas being cultivated and re-seeded. Fencing was also crucial to keep areas that have been mustered free from re-occupation by feral cattle and donkeys migrating in from the rougher more remote parts of the regeneration area. Though it is considered impractical to completely eliminate cattle from the regeneration area, cattle musters have been carried out in most years, often in conjunction with a donkey shoot, to keep grazing pressures down.

Intensive rehabilitation efforts have been concentrated primarily on the areas south and east of the Ord River, the current research area. In this area intensive fencing programmes gradually encompassed most of the degraded areas and allowed virtually the complete removal of grazing pressure. This in itself was sufficient to allow regeneration on some pasture types, notably the black soil plain pasture type. For most areas, however, the removal of grazing pressure was at best only partially successful in promoting rehabilitation, due to a lack of soil seed reserves, and hostile environments for seed germination and survival. Consequently, more intensive regeneration procedures were adopted where accessibility with cultivation equipment was not restricted by steep slopes or deep gully systems.



Kapok Bush *(Aerva javanica)* and Buffel Grass *(Cenchrus ciliaris)* colonise and begin to stabilize a gully head. Nelson land system.

Regeneration procedures, aimed at increasing water penetration, providing a seed bed and reducing wind velocity at ground level, were carried out by means of strip contour cultivation with opposed disc ploughs, conventional chisel ploughs and opposed disc pitters in a discontinuous pattern. Re-seeding with the introduced pioneer species Buffel Grass (*Cenchrus ciliaris*), Birdwood Grass (*C. setiger*) and Kapok Bush (*Aerva javanica*) was carried out simultaneously.

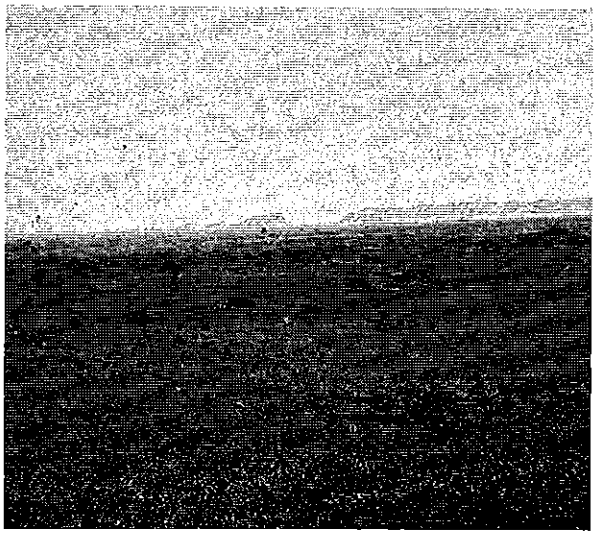
In general, good germination and establishment occurred on the cultivation lines. Spread of vegetation to the inter-cultivation areas was promoted by further strip contour cultivation and the continuing programme of stock control by mustering and fence maintenance.

Response to the regeneration practices has largely been a function of soil type, slope and exposure to grazing pressure. The most dramatic recovery has generally been on those soil types subject to the least erosion. In these areas more of the topsoil, which is both more fertile relative to the lower soil horizons and more likely to retain some soil seed reserves, was retained. Generally, sites with low slopes responded better than those with steeper slopes. Again the erosion factor was important here, erosion being more prevalent on steep slopes. Gully erosion on steeper slopes often made such areas inaccessible to cultivation equipment. Steeper slopes also had lower infiltration rates and greater run off resulting in more arid soil conditions less suited to vegetation establishment.

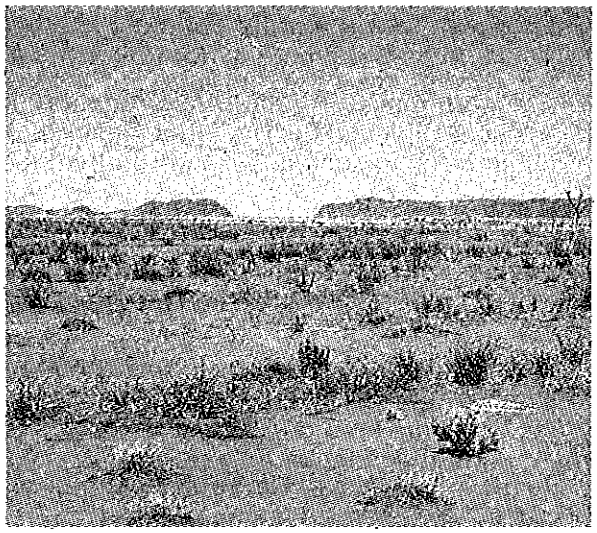
This programme has been successful in returning the vegetation cover to a large proportion of the regeneration area. The techniques and the species used have proven to be successful on the calcareous soils of the Negri Group in the Nelson land system and the alluvial soils of the river frontages. These soil types form extensive areas still in need of treatment on that portion of the regeneration area within the Study Area. The technique has achieved little success, however, on the extensive scalds on the clays of the outwash plains of the Antrim Lowlands unit and the foot slopes of the Elder Lowlands unit, which also form degraded areas north of the Ord River. Cultivation on these areas using the three introduced pioneer species mentioned, often produced a flurry of annual growth on the disturbed ground but the response has generally been short lived.

De Salis suggests that a range of species, including legume cultivars and native species, should be investigated to find viable alternatives for use in these areas. He mentions specifically the native grass genera *Triodia, Heteropogon, Chrysopogon* and *Aristida* but also shrubs such as *Acacia* and *Grevillea* species and trees such as *Eucalyptus* and *Terminalia*.

Sequence of photographs spanning the years 1960-1969 on the Turner River Plains just south of the Study Area graphically illustrate the effect of Department of Agriculture regeneration efforts.

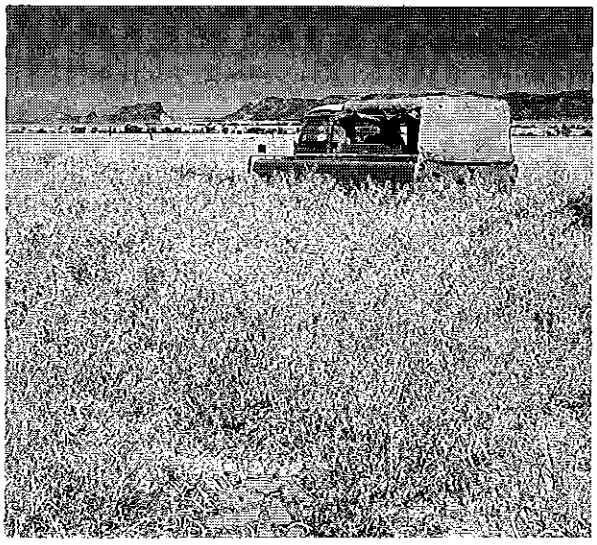


August 1960, prior to regeneration work, pioneer species *Corchorus* sp., *Tephrosia* sp. and some *Enneapogan* sp.



June 1961, vegetation response on cultivation furrows.

June 1966, colonisation by Kapok Bush and *Ptilotus* sp. is well advanced but some scalds remain.



October 1969, Kapok Bush is dominant and soil stabilisation has been achieved. Since this photograph was taken, a variety of pasture grasses have replaced the Kapok Bush as the dominant vegetation.

In a national park context, it would be preferable to use species indigenous to the area, if they offered a successful alternative. It may also be an advantage to select unpalatable pioneer species in an attempt to limit grazing pressure on these areas during the critical early years of recovery.

The Study Area north and west of the Ord River was fenced in the 1960s in an attempt, in conjunction with regular musters, to control cattle and donkey numbers on the degraded lands and facilitate their regeneration. These early efforts were frustrated by the inaccessibility of this area for several months each year during and following the wet season. During this period cattle would gain access to the regenerating lands through sections of fence line damaged by flood waters and would remain until a subsequent muster.

The Department of Agriculture subsequently concentrated its regeneration efforts on the lands south of the Ord and Panton Rivers which were accessible year round. In the Study Area north and west of the Ord River, fences have not been regularly maintained and have

fallen into a state of disrepair, and cattle have not been mustered for a number of years. These areas remain in a degraded condition and are subject to high grazing pressures from large numbers of cattle and donkeys. Cattle numbers in the Blue Hole Yard — Red Rock Creek areas were recently estimated to be well in excess of 2,000 head (Department of Agriculture pers. comm.), with donkeys also present in large concentrations.

The Department of Agriculture's regeneration efforts south of the Ord River have largely been successful and the Department is now prepared to undertake a more active regeneration programme on the degraded lands north of the Ord River and in its confluence with the Panton River.

The Department has anticipated that virtually all the highly susceptible and previously degraded country on the regeneration area will be under close management control within the next 2 years (Division of Resource Management, Annual Report 1982-83).

3.6.3 Future Regeneration Requirements

The Department of Agriculture recognises that special remedial treatment of the extensive areas of severe erosion along the Ord and Panton Rivers is a high priority. To successfully regenerate these lands an extensive and expensive fencing programme will be necessary to restrict the access of cattle and donkeys to the degraded areas.

The Department of Agriculture expressed concern that, if these eroded areas become part of a national park, there is a risk that the necessary funds required for their effective rehabilitation will not be available. For this reason the Department proposed a boundary some 5 kilometres to the west and north of the Ord River, excluding the frontage lands and the Ord and Panton Rivers from a national park. In this situation the Department of Agriculture would be responsible for fencing off the frontage lands along the national park boundary, controlling cattle and donkey numbers, and rehabilitating the eroded areas.

The Working Group recognises the Department of Agriculture's concerns and fully endorses the need to regenerate the Ord River frontage lands as a high priority, both to prevent further erosion and siltation of Lake Argyle and to restore these lands to a condition where they are fully representative of the river frontage grasslands and savannahs of the region. These areas of tropical grassland savannah and riverine environment are considered to be a major component of the proposed national park, as discussed in Section 3.2.2

The Working Group favours a proposed boundary south and east of the Ord and Panton Rivers, corresponding to a rationalisation and relocation of the existing fence lines established by the Department of Agriculture, to more manageable alignments. It recognises that to facilitate regeneration of the eroded and degraded lands, the fence lines proposed by the Department of Agriculture north and west of the Ord River will be required to control cattle and donkey numbers. In this context, the costing of the two options would be similar as they would both aim to fence off the frontage areas to permit regeneration programmes. The Working Group recognises that the Department of Agriculture has built up considerable expertise in the field of rangeland regeneration and sees value in that Department having a continuing involvement with the Department of Conservation and Land Management in the regeneration of these lands.

4 MANAGEMENT OPTIONS

The previous section identified and discussed the key issues relevant to a consideration of the future purpose and management of the Study Area. The Working Group recognises that each is valid in its own right.

The present status of the Study Area does not recognise or cater for the range of interests represented in the key issues, being principally concerned with regeneration of vegetation on eroded areas to facilitate their stabilisation.

While the present status permits mineral exploration, subject to conditions intended to minimise erosion and the sediment load of streams draining the exploration area, it does not meet the needs or aspirations of the Aboriginal traditional owners, nor does it facilitate management for conservation or tourism purposes. This is illustrated by the present difficulties being experienced as a result of rising tourism interest in the remote, relatively fragile and unmanaged resource. Concern has been expressed by the Working Group and others that if it is not checked this situation could result in damage to Aboriginal sites, lead to degradation of the land and tourist resource, and create additional management problems; should a vehicle breakdown occur, inexperienced or poorly prepared tourists would be placed in a potentially dangerous situation. The regeneration requirements are compatible with the primary intentions of the other key issues and could be achieved within the confines of a reserve serving a broader conservation function.

Similarly, while tourist development in isolation from other management considerations would clearly not cater for conservation interests and may, in the absence of a broader management perspective, fail in the long term to adequately protect the tourist resource (namely the attraction of a spectacular and unspoilt natural landscape), a conservation reserve in the form of a national park, given sufficient resources, would cater for tourism. Western Australia's national parks are collectively one of the State's greatest tourist attractions.

National park management in the usual sense, though it would facilitate protection of Aboriginal sites and the land to which they strongly relate, would not meet the aspirations of the Aboriginal traditional owners, who desire strongly to return to live on their traditional lands and to have a real input into the management of their land and affairs. Neither could the designation of this area as Aboriginal land be considered to adequately fulfil the requirements of the other key issues. There would be no guarantee that the land would always be managed in a manner compatible with the requirements of these interests or that resources and expertise would be available to realise these requirements.

Experience in the Northern Territory, particularly at Kakadu National Park, has shown however, that the requirements of Aboriginal traditional owners,conservation and tourism can be met in large national parks managed jointly by the Department of Conservation and Land Management and the traditional owners.

This option would enable the Aboriginal traditional owners to return to their traditional lands and to have an active input into the management of these lands. By facilitating a return to a culture and lifestyle more closely affiliated with tradition it would also enable them to sustain and strengthen their spiritual links with the land and work to prevent the loss of Aboriginal beliefs, art, language and technology. Importantly, it will also enable them to escape the severe social problems associated with living in seriously inadequate conditions in large communities and fringe dwellings, which are not based on Aboriginal clan groupings and force together peoples who traditionally may not mix, in very difficult circumstances and with little hope of employment or advancement. In this context, involvement in the joint management of a national park over the study area would also provide some employment opportunities and offer hope of reducing the people's total dependency on welfare payments.

The national park would benefit from the traditional owners' extensive and detailed practical knowledge of the flora, fauna and ecology of the Study Area (refer to page 33), and their knowledge of traditional management methods. Furthermore,the ability of the traditional owners to interpret a wealth of Aboriginal cultural knowledge, mythology and bush survival skills for tourists would add immensely to the scope of the national park as a tourist resource and serve to broaden the wider community's understanding of Aboriginal culture and the manner in which it relates to the Australian environment. This management option is considered by the Working Group to best cater for the diverse range of interests in the subject

area and is examined further in subsequent sections. It is consistent with the position adopted by the Environmental Protection Authority in its submission to the WA Aboriginal Land Inquiry (1983), in which it recognised a need for joint management options to be made available.

Mineral exploration is an activity which does not require long term land ownership or security of purpose. The areas and companies involved change with relative frequency and exploration can proceed on lands under a wide range of established landuses. In this regard it overrides relevant land management Acts, notably the Conservation and Land Management Act (1985).

Irrespective of the adoption of national park status over this land, under present government legislation and policy, mineral exploration could continue. In national park areas, however, it would be subject to conditions intended to minimise any adverse impact on the environment (similar conditions are already imposed on exploration in the regeneration reserve) and Aboriginal sites. The application of such conditions is considered to be appropriate, and is not regarded as an argument for not including these lands in the national park system.

The application of such conditions must also be considered in the context of this area as an important tourist attraction, for which scenic overflights are becoming an increasingly popular sightseeing option. Exploration activities are particularly visible from the air and as such will need to be carefully planned, managed and rehabilitated if the damage to the integrity of the scenic resource is to be minimised.

The Working Group believes, however,that there is a strong case for excluding the Bungle Bungle massif and its immediate surrounds from mineral exploration, other than broad scale mapping from a remote platform. This area is the spectacular and dominant feature of the Study Area, and a geomorphological and geological feature of considerable conservation and scientific interest and is of growing tourism importance. Furthermore, the topography is such that access for surface exploration purposes would be difficult and because of the nature of the terrain would leave highly visible scars which would be difficult to rehabilitate. The Bungle Bungle massif is considered to have low mineral potential.

Recommendation 1 — National Park Reservation, Reserve Boundaries and Mineral Exploration

The Working Group recommends that:

1.1 The north-western portion of the Ord River Regeneration Reserve including the Bungle Bungle massif should be proclaimed a national park;

1.2 the park should extend to an interim boundary along the eastern/southern bank of the Ord and Panton Rivers and the unnamed tributary of the Panton River (as shown in Map 8), to a point 1 km east of the western boundary of the regeneration reserve, then due south to the southern bank of the Panton River and west along the southern bank of the Panton River to the boundary of the Ord River Regeneration Reserve;

1.3 at the earliest opportunity discussions should be held with adjoining pastoral leaseholders with the aim of including within the national park the Osmond Valley pastoral lease; adjacent upland portions of Mabel Downs pastoral lease, including the the Osmond Valley, Mount Parker and the Winamma Gorge and Spring area; southern upland portions of Texas Downs pastoral lease; and a small area of Sophie Downs pastoral lease adjacent to the extreme south-west of the proposed national park, which would complete the inclusion within the national park of a feature of major Aboriginal mythological significance;

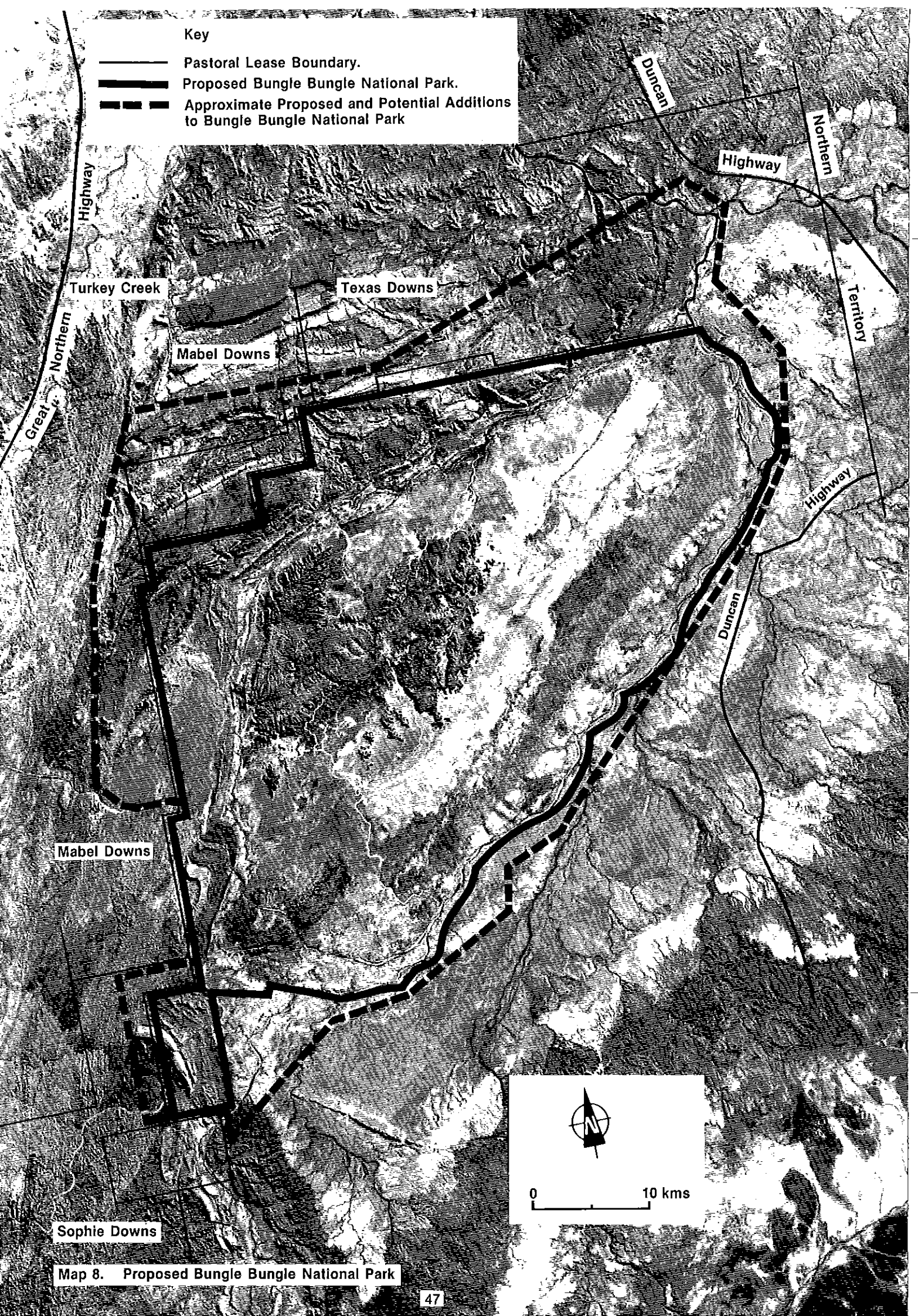
1.4 a biological survey be undertaken to determine the merit of including the remainder of the Osmond Range, and associated uplands to the west of the Ord River Regeneration Reserve extending as far south as the Ord River, within the national park;

1.5 the implementation of the above proposals, which apply to mainly rugged areas of little pastoral value, should involve a process of consultation with the pastoral leaseholders, aimed at determining appropriate manageable boundaries;

1.6 once fence lines south and east of the Ord and Panton Rivers within the regeneration reserve have been relocated on more manageable alignments by the Department of Agriculture, in liaison with the Department of Conservation and Land Management, the national park boundaries should be extended to the fence lines;

1.7 the future status of the MacIntosh Plains area, adjacent to the proposed south-western extension of the proposed national park and bounded by the Panton River in the east,(see Map 8) should be determined in discussions between the Departments of Agriculture and Conservation and Land Management once the regeneration programme has stabilised the area; and

1.8 in view of its high conservation value and low mineral potential, the Bungle Bungle massif and its immediate surrounds be excluded from any future mineral exploration, other than broad area mapping from remote platforms (aircraft or satellites).



Map 8. Proposed Bungle Bungle National Park

5 ESTABLISHED JOINT-MANAGEMENT NATIONAL PARKS IN THE NORTHERN TERRITORY

5.1 Introduction

To date there are no jointly managed national parks in Western Australia. A recommendation to this effect, if adopted, would therefore break significant new ground in the field of natural land management in this State. Successful realisation of the multiple management objectives of the proposed national park will be dependent upon the formulation of appropriate joint management mechanisms.

In the above context some members of the Working Group travelled to the Northern Territory to learn first hand from the experience gained through joint management of Kakadu and Gurig National Parks, the principal established models of national parks jointly managed with Aboriginal traditional owners in Australia.

Kakadu and Gurig National Parks are managed respectively by the Australian National Parks and Wildlife Service (ANPWS) and the Conservation Commission of the Northern Territory (CCNT).

The fact that there are two agencies running joint management national parks in the Northern Territory, each with their own legislative requirements and divergent approaches to joint management, contributed to the diversity of experience that was available. This in turn contributed substantially to the value of the trip as a learning exercise.

The intention while in the Northern Territory was to talk to as many people as possible associated either directly or indirectly with the joint management issue. This was largely achieved, though through conflicting time commitments it was not possible to meet with members of the Gagadju Association, the traditional custodians and owners of Kakadu National Park.

Discussions were held with officers of ANPWS and CCNT, and with members of the Aboriginal custodians involved with the management of Gurig National Park. Working Group members also met with officers of the Department of Aboriginal Affairs, the Northern Lands Council, the environmental adviser to the Gagadju Association and Dr Sally Weaver,from the University of Waterloo, Canada (Visiting Fellow, ANU, North Australia Research Unit), who is studying aspects of jointly managed National Parks in the Northern Territory (see Appendix II).

5.2 Mechanisms of Joint Management

As mentioned previously, the ANPWS and CCNT have adopted divergent approaches to joint management, each of which have their own particular advantages and disadvantages.

5.2.1 The Kakadu Model

Kakadu National Park (Stage I) is owned freehold by the traditional owners via the Kakadu Aboriginal Land Trust and leased to the Director of ANPWS for a period of 99 years for the purpose of a National Park.

Agreements over the conditions of the lease are to be negotiated at least every 10 years between the Northern Land Council (NLC) and the Director of ANPWS. Modification of the lease conditions, however, is subject to the agreement of the Director of ANPWS. It is likely the agreement will be renegotiated this year.

At present there is no formal mechanism to ensure equitable involvement of the traditional owners in joint management. Other than in the preparation of plans of management, where the Director is required to consult with the NLC with regard to the wishes and opinions of the traditional owners, liaison with the Aboriginal people on management issues depends on the goodwill of the ANPWS.

The ANPWS employs a number of senior and well respected traditional owners, who relate well with Europeans, as Cultural Advisers. These people have provided the main means of consultation on day-to-day management issues and where park development proposals may impact on Aboriginal sites. They have the power to stop or require modifications to proposals which would otherwise affect areas of significance. The Service does not, however, restrict its consultations to the Cultural Advisers and will consult directly with the appropriate person if there is no cultural adviser for the area concerned. Thorough consultation is considered to be important for the maintenance of good relations.

The Gagadju Association, an organization representing the traditional owners, set up to distribute royalties from the Ranger Uranium mining operation, is also being used increasingly as a means of consultation on management issues. This association has recently employed an environmental adviser to give them independent advice on park management issues and has a park management committee.

Any major development within the park must also obtain NLC approval.

The advantages of this informal consultation process are its flexibility and adaptability, and the speed with which decisions regarding smaller developments affecting a particular adviser can be reached, potentially giving cost and time saving advantages.

However, this approach also has a number of disadvantages. Most significantly, it means that the Aboriginal community are participating only to the extent that they are reacting to proposals, rather than participating fully in the decision making process. In the longer term this may cause resentment and dissatisfaction and create management difficulties if the traditional owners feel they are not being fully involved in the management of their land.

This informal approach also means that it is not possible to obtain a corporate view on an issue from all the clans involved. As there are 16 clans, a number of which may need to be consulted with regard to any one major project, (say a road proposal), the Service must negotiate with and obtain the agreement of each individual clan involved. Furthermore, at this level an individual may be reluctant to be assertive and so may not speak up about his concerns. Subsequently, after considering the issue he may change his mind and request a change of management action. These situations have led to modification to projects which were already well advanced, giving rise to additional expense and delays.

It is understood that the traditional owners are keen to have a more active and direct input into park management and favour representation on a Board of Management similar to that functioning in Gurig National Park.

The ANPWS feel that a Board is not the place to resolve all issues, however they recognise that the present system, in which there is no formal mechanism by which Aboriginal people are involved in management, is unsatisfactory. It is likely that following a reassessment of the lease condition there will be a Board of Management, but the form it may take is uncertain at this stage.

5.2.2 The Gurig Model

Gurig National Park (Coburg Peninsula Aboriginal Land and Sanctuary) is the specific subject of the Coburg Peninsula Aboriginal Land and Sanctuary Act (1981).

The Act acknowledges the secure right of Aboriginals to use and occupy certain land on the Coburg Peninsula in the Northern Territory.

The land subject to the Act is granted to and vested in perpetuity in the Coburg Peninsula Sanctuary Land Trust for the Group (traditional Aboriginal Owners and Aboriginals entitled to use or occupy the Sanctuary). The Trust consists of a chairman and three other members appointed by the Northern Land Council from amongst the Group.

The Sanctuary is established in perpetuity as a national park for the benefit and enjoyment of all people for which the Northern Territory pays an annual fee of $20,000, indexed to the CPI.

The National Park is managed by the Coburg Peninsula Sanctuary Board, a corporate body with perpetual succession. The Board comprises eight members, four each from the CCNT and the Aboriginal traditional owners, the latter being appointed on the nomination of the Northern Land Council. Both the Chairman and Deputy Chairman are appointed from the Aboriginal members of the Board. The Commission is represented by the Director and senior officers.

There is no provision in this legislation for advisers (such as the NLC) to be present at Board meetings, though normally both the NLC and CCNT have observers at meetings. At present meetings are held quarterly but this may be changed in the future.

Functions of the Board as defined by the Coburg Peninsula Aboriginal Land and Sanctuary Act are as follows:

(a) to prepare plans of management for the control and management of the sanctuary;

(b) to protect and enforce the right of the group (Aboriginal traditional owners) to use and occupy the sanctuary;

(c) to determine, in accordance with the plan of management, the rights of access to parts of the sanctuary of persons who are not members of the group;

(d) to ensure adequate protection of sites on the sanctuary of spiritual or other importance in Aboriginal tradition; and

(e) such other functions in and in relation to the sanctuary as are imposed on it by or under the plan of management.

Should a difference of opinion between the Commission and the Board arise, the difference is resolved by a resolution of the Board and the Commission must act in accordance with that resolution.

More recently the concept of supervisors meetings has been introduced to take some of the load off the Board meetings and to enable issues to be talked through and in some cases resolved on a more informal level.

Supervisors meetings are held monthly and involve the Aboriginal Board members, NLC officers and Conservation Commission officers with routine management involvement with the park. They are held at the Aboriginal outstations in rotation to encourage traditional owners to attend and become more involved with the management process and decisions being made.

A plan of management has recently been completed to draft stage following extensive consultation with the traditional owners and has been approved for release by the Board for a period of public comment. To encourage the involvement of all traditional owners in developing the final plan, a video documenting the development of the plan and explaining the recommendations it contains has been produced in both Iwaidja (the local dialect) and English language versions. This project is indicative of the importance placed on direct involvement of the traditional owners in the management decision-making process.

The main advantage of a formal system results from the secure and theoretically equitable input to the management process that it offers both parties. This aim, if fully realised, should go a long way to ensuring a co-operative approach to joint management in the long term. As with the system operated by the ANPWS in Kakadu National Park it is important for the ultimate success of the system that motivated and sensitive people are employed in key positions.

A board of management on its own also has disadvantages as a decision-making forum. It can be a relatively cumbersome mechanism, particularly if all decisions are made at board level. Furthermore, the board meeting, as a forum for decision-making, is alien to the traditional Aboriginal decision-making process, which involves extensive discussion amongst the relevant people leading to a decision by consensus agreement. If decisions are adopted without consideration for the need to accommodate the Aboriginal approach to decision-making, it can lead to the Aboriginal traditional owners having very little real input to the decision-making process. In the longer term this situation could lead to disenchantment with the decisions made and the joint-management arrangement generally.

This situation is recognised at Gurig and has lead to the introduction of the supervisors meetings, which are an attempt to accommodate the Aboriginal decision-making process by permitting more extensive, less formal discussion of issues. Equally importantly such meetings should make the decision-making process more accessible to all traditional owners and encourage wider participation in management of the park.

Despite these recent improvements the joint-management arrangements adopted at Gurig are still seen to have a number of weaknesses. Without any intent on the part of the Commission, issues sometimes pass through Board meetings and are agreed upon without the Aboriginal Board members fully appreciating the implications of the decisions being made.

It is also acknowledged that the system is still not allowing adequate consideration of issues by traditional owners. This latter problem may improve with further development of the supervisors meeting concept.

5.3 Responsibility for Welfare Issues

On this issue too there is marked divergence between the situations in Kakadu and Gurig National Parks,largely as a result of circumstance rather than policy.

ANPWS take little responsibility for the social welfare of the traditional owners of Kakadu National Park. This responsibility is accepted by the Gagadju Association, which is funded primarily through a 4.75% royalty from Ranger Uranium amounting to some $3,000,000 a year, and is responsible for the distribution and investing of these funds amongst and on behalf of the traditional owners.

These funds are used to provide the traditional owners with medical services, education, outstation support vehicles and for other constructive uses. The Association has also invested in significant real estate in and around the Park, notably the Cooinda Pub and the Border Store. The Cooinda Pub is being developed into an attractive tourist accommodation centre which also runs popular boat tours on Yellow Water. These facilities are run by non-Aboriginal managers and have the potential to provide a solid investment for the Association.

The Gagadju Association is now a substantial employer in its own right, directly employing some 40 people both Aboriginal and non-Aboriginal, including an executive officer, accountant, several mechanics and the staff of the Cooinda Pub and Border Store. As a result of the distribution of limited amounts of money to the traditional owners directly, no one claims unemployment benefits or any other special allowances other than pensions and child endowment benefits where appropriate.

The fact that the traditional owners have accepted responsibility for looking after their own social welfare needs leaves the ANPWS free to devote all its resources towards managing the National Park. In the social welfare role it now functions only in an emergency back-up role.

The CCNT, in contrast to the situation at Kakadu,is largely responsible at present for the welfare of the traditional owners of Gurig National Park. This situation exists for several reasons:

— It is partly a reflection of the relatively recent establishment of Gurig National Park, and an agreement that the Commission would initially help establish the community.
— The income generated by the traditional owners of Gurig National Park is modest, approximately $21,000 from the annual rent paid by the Commission and $40,000 from safari hunting for feral Banteng Cattle.
— The traditional owners, as a result of some of the Board members' previous bad experiences with associations, have not yet agreed to form an incorporated association and are thus unable to handle directly the Community's own income, or arrange loans, and importantly do not readily qualify for many forms of assistance available from the Territory and Commonwealth Governments and outstation resource centres.

Accordingly the CCNT continues to accept the major responsibility for welfare, to the extent that it has provided houses, generator sets, and hot water services for each of the outstations and organises for maintenance and repairs to be carried out when necessary. It has also built and staffs the community store and is attempting to arrange for education facilities.

This responsibility takes up a substantial amount of staff time and a proportionate amount of the Board and supervisors meetings. This welfare input is both costly to the Commission and time consuming for its staff. Furthermore, it is clearly preferable for the traditional owners to accept responsibility for their own welfare needs and priorities.

The formation of traditional owners into an incorporated association is considered a high priority.

5.4 Aboriginal Training Programmes

An Aboriginal training programme has been running at Kakadu National Park for four years. Trainees are selected by the Gagadju Association, with some advice from the ANPWS. Because of this the Association feels a certain responsibility for the success of the trainees. If some are not performing the Association will indicate that a better effort is required of them. To date 14 people, both males and females, have been through the training programme for ANPWS; eight are still employed as rangers. Some trainees have also been put through the course for the Conservation Commission, which at present does not run a training course of its own.

Recently, a proposal by the ANPWS Aboriginal staff that CEP funds be utilised to put prospective trainees through a work experience course to select the most suitable applicants for subsequent ranger training has been adopted and appears to be successful.

The existing training programme lasts 12 months and attempts to cover all possible aspects of ranger work (based on the work that tertiary qualified ANPWS rangers may be involved in). Specific subjects include topics such as ANPWS structure and functioning, the role of a ranger, park administration, motor maintenance, radio procedure, aerial photo interpretation, public relations, Aboriginal art-site conservation and various environmental studies. In many instances people with specific expertise in these fields are used to explain and demonstrate aspects of their work.

The present programme is aimed at fitting the trainees into the standard ANPWS ranger position. There are no unskilled park keeper positions within the ANPWS system.

Criticisms of the training programme have centred on the relatively short periods of practical on-the-job training it involves, its low emphasis on developing reading and writing skills (trainees with particularly low skill level in this regard are given remedial classes after hours), the lack of in-course assessment of progress and the lack of relevance of much of the course to the actual work they will undertake as rangers.

Trainees are often disillusioned initially when they start work and find that it entails mainly routine duties. Most, however, have a genuine desire to look after their country and persist. The turnover rate is said to be lower than that for non-Aboriginal rangers.

Concerns have also been expressed that trainees come out of the course with a high disparity in ability. Manual skills are generally acceptable but ability to do written work is often lacking. Many also lack the confidence to approach tourists.

It is generally recognised by the ANPWS that the aims, format and content of training programmes need further consideration in conjunction with further consideration being given to the range and scope of Aboriginal employment.

The CCNT is also in the process of reviewing training needs and has recently held a workshop attended by both CCNT and ANPWS staff to consider this issue.

The South Australian National Parks and Wildlife Service has also recently held a ranger training course to train local (Adnjamathanha) people to become "Adnjamathanha Heritage Rangers" in the recently established Gammon Ranges National Park.

The intention is that the Heritage Rangers would function to help interpret the traditional Aboriginal culture, mythology and bush survival methods for park visitors. At the same time the course would provide a formal basis for tribal elders to pass on much information on customs, stories and the creation of sites to younger Aboriginal men, an important means of helping to ensure that this information is not lost forever.

The course is considered to be unique in the realm of Aboriginal employment training and possibly one of the very few courses where the Aboriginal people have a substantial input in teaching non-Aboriginals about Aboriginal people. This aspect of the training is considered to have been immensely successful in terms of the personal development and pride the trainees have shown and the positive feedback from the public. Trainees came to enjoy talking with confidence to the public, particularly about their culture and heritage.

5.5 Aboriginal Employment

In both Kakadu and Gurig National Parks Aborigines are employed in the normal ranger system and work alongside non-Aboriginal rangers.

This system generally works; most Aboriginal rangers have a genuine desire to be involved in the management of their land and are very conscious of the role of rangers in representing the Aboriginal people. Generally rangers will operate in teams of two, comprising an Aboriginal and non-Aboriginal ranger working together. This concept is regarded favourably by the traditional owners in both Kakadu and Gurig National Parks.

There are, however, a number of issues which are widely acknowledged to need further consideration.

These include:

— The need to review the present job description of rangers to evaluate the possibility of creating a different ranger classification to make better use of the Aborigines' traditional skills and cultural knowledge in park interpretation and management. It should be recognised in this context that most ANAWS rangers are tertiary qualified. Some

Aboriginal rangers and traditional owners have left ranger positions because they find emptying rubbish bins and cleaning up after visitors to be a servile existence on their own land.

— Career progression for Aboriginal rangers. Under the existing system Aboriginal rangers because of their poor education have very limited opportunities to progress beyond base grade rangers, particularly in the ANPWS with their emphasis on professional qualifications.

— The potential of alternative 'non ranger' employment, which could involve a range of possibilities, including feral animal control, clerical work or trade positions. Some Aboriginal people are moving into these positions in Kakadu now. Further employment opportunities could be provided by wider use of contracts for specific projects. This may suit some people who have not developed the conventional Western work ethic and prefer short term work.

One further matter is also widely acknowledged to be causing problems. This relates to the reluctance, for political reasons, to dismiss Aboriginal rangers that are not performing up to the appropriate level. Retaining these individuals frustrates and discourages those Aborigines that are working well for no more reward and is detrimental to the public image of Aboriginal rangers. The need to redress this situation is recognised by the Gagadju Association, NLC and staff of the national park agencies.

5.6 Conclusions

The application of the concept of joint management of national parks is still in its relative infancy. This is particularly apparent in Gurig National Park which is still undergoing an active phase of initial development. In Kakadu National Park joint management has had a somewhat longer period to evolve and already changes to the original concept are taking place, notably in the degree of involvement of the Gagadju Association. It is likely that further changes in the near future will result in formalised joint management mechanisms in the form of a Board of Management.

As the first national parks of their type, it should not be surprising to find that some of the mechanisms of joint management adopted could be improved upon in the light of experience and this has proved to be the case. In this context there are clearly advantages in adopting a mechanism which allows sufficient flexibility to enable the system to adapt and evolve in the light of experience, subject to the agreement of both parties.

It is clear, however, that the broad concept of Aboriginal involvement in the joint management of Kakadu and Gurig National Parks with the respective national parks agency is capable of working effectively. The concept is well accepted by the Aboriginal owners, who are typically interested in the management of their traditional land, and is also recognised and accepted by the people in the national park agencies (ANPWS, CCNT) and the Northern Land Council and Department of Aboriginal Affairs with whom Working Group members spoke.

6 JOINT MANAGEMENT CONCEPTS AND OBJECTIVES FOR A NATIONAL PARK IN THE STUDY AREA

6.1 Tenure

The Working Group recognises the Aboriginal traditional owners' strong ties to the Study Area and their desire to return to their traditional lands for spiritual, social and economic reasons. It also recognises that this area is an important part of the heritage of Western Australia and Australia and warrants reservation as a national park for the benefit and enjoyment of the community at large.

Security of tenure and purpose is essential for a national park, if it is to perform its function in perpetuity as intended. Equally essential is security for the traditional owners to reside on and participate in the management of their traditional lands.

In this context a lease arrangement as applies in the case of Kakadu National Park is not recommended because of the 99 year maximum time limit of leases. While this may seem a long time, in geological, historical or evolutionary terms it is very short. If national parks were restricted to a 99 year lease arrangement, the leases on some of the earliest and most popular national parks in Australia would within a few years be expiring and subject to the 'possibility' of renewal.

In recognition of the value of the area as an important part of the heritage of all West Australians, the Working Group favours the vesting of the area in the National Parks and Nature Conservation Authority as an A Class reserve for National Park. The special relationship of the Aboriginal traditional owners to their land and their need for secure residence on and an equitable role in the management of their traditional lands is also recognised. If the traditional owners are to retain and strengthen their spiritual and cultural relationship with their land and its flora and fauna, as is their desire, then clearly they must be able to reside on and maintain close contact with their land. As the input of the traditional owners to park management and tourism would stem from their knowledge of the flora and fauna, and Aboriginal culture and mythology, it is also important from these national park and tourism perspectives that they should live on their traditional lands.

In the context of this extensive park, this requires that either the traditional owners are permitted to live within the national park; or alternatively that the proposed national park is substantially reduced in size, to exclude these areas from the national park without creating enclaves.

While recognising that national park policy normally dictates that people should not reside within park boundaries, the Working Group determined, for a number of reasons, that on balance it is preferable for the traditional owners to live on an outstation or outstations established within the confines of the park and to limit the impact associated with the living areas by management means. In this context it is considered that the proposed park is of a sufficient size that, given appropriate management, it could accommodate Aboriginal outstations without endangering its conservation values. As stated above, the maintenance and strengthening or traditional cultural ties and knowledge of plant and animal resources and ecological relationships is neccessary if the maximum benefit is to be realised from the input of traditional owners to joint management. This is unlikely to occur if the traditional owners are not permitted to live in the park. The possiblity of establishing outstations external to the national park, is not generally favoured for these same reasons, though it may be appropriate where the land in question is spiritually and culturally relevant to the group and their traditional land relationships within the proposed park are focussed on areas adjacent to the outstation.

It is considered that this option provides greater flexibility in future management, given that at this stage, it is not known whether one or several separate living areas would be required.

It also avoids the potentially severe management problems associated with having enclaves of differently vested or freehold land within the national park, over which the park managing body has no control of landuse or management practices even though they may be detrimental to the surrounding national park. Thus, while technically avoiding the philosophical problem of having people residing in a national park, establishing enclaves would present potentially more serious management problems.

The Working Group accordingly considers that the vesting of the area in the National Parks and Nature Authority should be subject to the conditions providing secure residence and equitable input to management for the Aboriginal traditional owners.

An A Class reserve, which requires the approval of both Houses of Parliament before any amendments can be made to the vesting conditions, is necessary to provide an adequate level of security under this mechanism.

At present there is no legislative basis in Western Australia which will provide for the necessary security required by both parties to the joint management national park. The Working Group's terms of reference do not allow a consideration of the legislative changes necessary to facilitate its proposals.

The Working Group acknowledges that the people recognised by the Aboriginal community as traditional owners of the Study Area have indicated their preference for freehold title to the area, in conjunction with a negotiated establishment of a jointly-managed national park.

Recommendation 2 — Tenure

The Working Group recommends that:

2.1 the proposed national park be vested in the National Parks and Nature Conservation Authority as an A Class reserve; and

2.2 the vesting be subject to mechanisms providing secure residence and equitable input to management for Aboriginal traditional owners. Such mechanisms are not available under existing legislation and their consideration is beyond the terms of reference of the Working Group.

6.2 Mechanisms of Joint Management

In considering joint-management mechanisms for the proposed national park it is recognised that from the viewpoint of the traditional owners, the land is not simply a conservation resource, it is deeply interwoven with the animals and plants as the basis of their spirituality and, moreover, it is their home. The Working Group also recognises the contribution the traditional owners can make to management of the national park, through their extensive and detailed knowledge of plant and animal resources and ecological relationships in the area. Furthermore, the interpretative opportunities offered by their wealth of cultural knowledge, mythology and bush survival skills would add immensely to the interest and scope of the national park in its role as a tourism and educational resource.

From these considerations and the discussion in the section on Established Joint-Management National Parks in the Northern Territory, it is argued that the traditional owners need an equitable input to management decision-making. It is insufficient for them to be confined to a consultative position in which they are required to respond to management decisions, but are not involved with representatives of the Department of Conservation and Land Management in formulating policy and management decisions. In this context it is necessary that the management decision-making forum on the reserve be the primary authority in determining management decisions in the proposed national park. If this is not the case, the Aboriginal traditional owners will not have the equitable input to management that is necessary if they are to have the ability to influence management decisions affecting their personal security and areas of great significance to them. However, the Department of Conservation and Land Management will have the responsibility for the administration of the national park, including staffing and budgeting, with the involvement of the joint-management forum in developing proposals for these and other areas of administration.

The need for formal mechanisms securing Aboriginal input to joint management has been recognised in the Northern Territory with the result that Kakadu National Park will probably follow the route of Gurig National Park in adopting a formal board of management in some form, following a likely review of the existing lease agreement.

It is suggested that the primary decision-making body for the proposed national park should be a board of management comprising representatives of the traditional owners and the Department of Conservation and Land Management. Members of the board should have access to independent advice.

There are considered to be advantages in a process that arrives at decisions by consensus agreement. This enables a degree of flexibility in the numbers represented on the board, facilitates adequate consideration of issues and avoids any tendency towards the develop-

ment of a voting block. It is anticipated that, as there may be several Aboriginal clan groupings represented in the park, there may be more Aboriginal than management agency representatives on the board.

For effective input from all of the traditional owners it is necessary that the mechanisms of joint management should facilitate broad consultation with and amongst the traditional owners prior to decision-making.

It is considered that an Aboriginal incorporated organisation representing the traditional owners of the proposed Bungle Bungle National Park would be best placed to undertake this consultative process. It would enable those traditional owners, relevant to a decision on the issues at hand, to be brought together to discuss and develop recommendations in a manner which is compatible with traditional Aboriginal decision-making processes. To facilitate this decision-making process, it would be necessary to put issues or proposals to the organisation allowing sufficient time for the relevant people to discuss the issues and arrive at an agreement.

Where major planning or policy issues are concerned, the response could then be directed to the board and discussed at the following board meeting, as the position or response of the traditional owners. By facilitating broad consultations of traditional owners on issues prior to board meetings this process should facilitate a more rapid resolution of issues than might otherwise be possible.

There are considered to be advantages in those members of the board of management representing the Department of Conservation and Land Management, being officers regularly associated with the management of the park, either in the park or in a regional management role. This would present several advantages over the alternative of executive staff representing the Department; the officers would be more familiar with the reserve and its requirements, having dealt with it on a regular basis and for the same reason would be better known to the traditional owners. As this area is remote from Perth, such an arrangement would also have distinct cost and time saving advantages for the Department.

To avoid the problem of a formal board of management being too clumsy and bureaucratic in its decision-making it is considered that it should function primarily in the role of a reviewing and ratifying body for policy and major planning decisions, rather than becoming involved in routine management issues.

A less formal, more flexible and responsive mechanism for facilitating liaison between the Aboriginal traditional owners and the Department is required to resolve routine management issues, not involving policy decisions. Such routine decisions requiring Aboriginal input should be handled by the senior management officer on site in liaison with the Aboriginal organisation.

Thus, depending on the issue involved, the Aboriginal organisation would liaise either directly with the board of management or with the senior management officer on site. The process of liaison should operate in both directions, that is, issues or proposals could be developed by the Aboriginal organisation for consideration by the board of management or senior management officer, and either of the latter could put issues or proposals to the Aboriginal organisation for consideration.

In line with the concensus approach, liaison should normally occur at the concept phase of a proposal, so that the detail of issues requiring consideration can subsequently be identified, discussed and resolved jointly.

It must be recognised, however, that it will take time and resources to achieve an active, innovative and mutually rewarding Aboriginal participation in joint management, rather than merely token participation. Resources will be needed to establish, through research and liaison with the traditional owners, an Aboriginal organisation which is relevant to the Aboriginal decision-making process; to gain access to expert advice in areas such as park management, law and anthroplogy; and to provide the traditional people with a better grounding in the concepts of national park and tourism. It has been noted that Aboriginals involved in the joint management of other parks often have difficulties with these concepts, which are alien to them. It should be recognised that much of the Australian landscape is largely a product of the interaction of Aboriginal man, through the use of fire and other management tools, with the biophysical environment. Furthermore Aboriginal man, in his mythology, is a part of the environment just as are the rocks, plants and animals. In this context, the concept of a national park or wilderness area, from which man is generally excluded, is foreign to Aboriginal thinking.

This does not mean that there is no role for Aboriginal input to joint management in a national park, such as that proposed at Bungle Bungle. It does indicate however that these concepts and the role of national park management must be carefully explained, and the traditional owners given more exposure to national parks and park management practices, before they can be expected to participate effectively in joint-management. These requirements are pursued further in the section on Funding Requirements.

Local advisory committees, comprising representatives of the Department of Conservation and Land Management, local government, State Government agencies and local interest groups, have been set up, with varying degrees of success, in relation to several major national parks in Western Australia, to facilitate liaison between the park managers and the local community. Where the national park is of some significance to the regional community, as the proposed Bungle Bungle National Park is likely to be, some advantage is often seen in the improved liaison that the advisory committee can provide. It is considered, however, that the responsibility for establishing this further level of management input, if it is desired, should rest with the Department of Conservation and Land Management in consultation with local government.

Because of the multiple uses proposed for this national park, careful planning and management will be needed to minimise conflicts of purpose. This issue is addressed in section 6.4.

It is recognised that the Conservation and Land Management Act does not facilitate all the elements of the joint-management mechanisms proposed in this report. The consideration of possible legislative requirements necessary to facilitate these proposals is, however, beyond the scope of the Working Group's terms of reference.

Recommendation 3 — Mechanisms of Joint Management

The Working Group recommends that:

3.1 the proposed national park be jointly managed by the Department of Conservation and Land Management and the Aboriginal traditional owners;

3.2 a Board of Management be established with representatives from the Department of Conservation and Land Management and an incorporated body representing the traditional owners to guarantee equitable input to management decision-making for both parties. The Board should be the primary decision-making authority with respect to management of the reserve. There are considered to be advantages in a co-operative and collaborative decision-making process based on consensus agreement;

3.3 the Board should function as a reviewing and ratifying body, considering recommendations on major issues, including policy, planning and budget issues developed by it or referred to it by the Department of Conservation and Land Management, the Aboriginal incorporated organisation and other individuals or bodies;

3.4 members of the Board should have access to independent advice;

3.5 there should be some recourse to technically competent, independent and mutually acceptable adjudication should agreement not be possible within the Board;

3.6 decisions which would affect the status of sites of significance to Aboriginals should be subject to agreement by the Aboriginal incorporated organisation; and

3.7 the Department of Conservation and Land Management prepare at the earliest opportunity and in liaison with the Board of Management a draft plan of management for public comment. The final plan of management is to be made public following its endorsement by the Board.

6.3 Hunting and Gathering

Present evidence indicates that Aboriginal man has been resident in Australia for at least 38,000 years. During this time he has, through the use of fire and other traditional management practices, exerted a profound influence on the Australian landscape and particularly the Australian flora and fauna.

As a result of this long period of occupation, the flora and fauna over much of Australia was changed to one adapted to living under a new environmental regime, in which Aboriginal man's management practices were a major component. In this context, much of the Australian wilderness environment is, in part, a man-modified environment. Furthermore, it is becoming increasingly apparent, as a result of work such as that of Latz and Griffin (1978) and Bolton

and Latz (1978), that the survival of many species may be dependent on the continuation of the management regime exerted by Aboriginal man, particularly the fire regime. In large part therefore, it appears that successful national park management should attempt to emulate the traditional management practices utilised by Aboriginal man.

In this context, it is likely that national park management can learn much from Aboriginal people that retain a knowledge of the traditional use of fire and other management practices in a given region.

This should not be interpreted as meaning that Aboriginal people hunting with the aid of modern weapons and transport and operating from a permanent settlement will not deplete flora and fauna stocks in the area around the settlement if measures are not taken to control the level of usage. Clearly this would not be the case.

Conversely, neither should it be supposed that Aboriginal people using modern hunting methods in a regulated manner, may not return management benefits in a national park such as that proposed for Bungle Bungle, where there is likely to be an ongoing need to control the numbers of cattle and donkeys.

Experience in Kakadu National Park has shown that, following the eradication of the bulk of the water buffalo population by contractors supplying the human and pet food markets, subsistence hunting by the resident Aboriginal population has maintained the buffalo population at a very low level. This has resulted in a spectacular regeneration of swamp vegetation previously badly degraded through the grazing and wallowing actions of buffalo.

The practice of subsistence hunting and gathering has a further benefit, that of maintaining many of the traditional skills of the hunter gatherer and maintaining the community in close contact with the flora and fauna of the park. As a consequence the traditional owners remain aware of dynamic changes occurring in species population levels and of events such as species returning following the regeneration of degraded areas. Experience, again in Kakadu National Park, has shown the resident Aboriginal community to be the 'eyes of the park', as they are generally the first to become aware of these dynamic changes.

The question of Aboriginal hunting and gathering in the proposed national park is one issue which will need to be addressed in detail by the managing body in the plan of management.

In the absence of detailed information on the flora and fauna of the proposed national park, it is not appropriate for the Working Group to propose rigid and inflexible management recommendations on the issue. There is, however, a need for the Report to suggest conceptual management controls which may be appropriate.

The following management controls with respect to Aboriginal hunting and gathering in the proposed national park are suggested:

- Hunting and gathering activities should be strictly limited to a subsistence level. (It is not anticipated that they would constitute the whole diet.)
- Hunting and gathering of native flora and fauna should be limited to species which are not considered to be rare or endangered and permitted only to the extent that it does not endanger local populations. (It is anticipated that most hunting would be directed towards feral cattle and donkeys, in which case it would benefit the national park, by exerting a degree of control over numbers);
- Hunting should be rigidly restricted to certain areas away from general public access, and should in large part be confined to the Aboriginal traditional units.
- Hunting should be confined to people traditionally associated with the area, and managed by issue of a permit from the Department of Conservation and Land Management with the consent of the Aboriginal organisation.

6.4 Management Zoning Concepts

While clearly some amendments to current national park policies will be necessary to accommodate joint management and a resident Aboriginal population, the maintenance of ecosystems and conservation of wildlife and heritage values remains of primary importance in the proposed national park. Indeed, to a large degree the long term interests of both the traditional Aboriginal owners and tourism are best served by the conservation of these basic natural and heritage values of the park, which serve as a focus for both Aboriginal culture and mythology and as principal tourist attractions.

The designation of zones within reserves, to define and separate areas serving different functions or intensities of use, is a commonly applied reserve management tool.

It is particularly applicable in the context of reserves which serve multiple functions, where it facilitates administrative and development control over areas serving a range of management objectives and uses. While the Working Group argues that conservation and tourism functions can be successfully mixed with the requirements of an Aboriginal community in the context of the large park proposed, they will each function most effectively if spatially separated within the park.

The management zoning concept, applied to national parks, is not dissimilar in intent to town planning zones which separate different functions in urban areas. Management zoning enables functions to be located in areas which, within the constraints of the available resource, are optimal for their requirements, while minimising their impact on adjacent areas serving different functions.

Thus for example the focus for tourism at Bungle Bungle would best be located in an area in which the landforms are well developed and spectacular, but not in an area which also contains rare flora. It should be located, as far as possible, on stable terrain which can best cope with the usage pressures, and in an accessible position. It should not be located near an important Aboriginal site (unless that site is chosen as a focus for tourist interest), or in an area which would require an access route to be constructed through a key conservation area.

Similarly, Aboriginal living units should ideally be located in an area which is spiritually and culturally relevant to the group, is readily accessible, will not have an impact on rare wildlife and which is sufficiently distant from tourism development sites to allow privacy and separation of function.

The Working Group has developed a conceptual system of management zones, based on a Conservation Zone and a Park Facilities Zone, each of which is subdivided into several management units with their own management emphasis. No attempt has been made by the Working Group to define boundaries for the management zones or to develop these concepts as firm recommendations, as this is seen to be the function of the proposed management body in the process of developing a detailed management plan.

The following conceptual management zones are suggested:

6.4.1 Conservation Zone

This zone would encompass the undeveloped sections of the proposed national park and as such would constitute the great majority of the park.

Conservation Units

- Conservation units would comprise the bulk of the Conservation Zone including most of the Bungle Bungle massif.
- Priority in these units is given to the conservation of native flora and fauna, landforms and Aboriginal sites.
- Vehicle access would be restricted to that required for management purposes. All other access would be by walking, with persons other than traditional owners required to register with management.
- Hunting in these units would be subject to strict management controls and should probably be limited to the removal of feral species.

Aboriginal Traditional Units

- Areas reserved for the use of the Aboriginal traditional owners in ways compatible with soil conservation requirements and general national park purposes. Subsistence hunting and gathering of a range of species not considered to be rare or endangered should be permitted to a level which does not threaten local populations.
- Entry to these areas would be restricted except with the permission of the Aboriginal community.

Landscape Protection Units

— Priority would be given to the conservation of native flora, fauna, landforms and Aboriginal sites, with provision for low-key, managed tourist access.
— Limited private vehicle access may be provided.
— Guided and self-guiding walking trails and interpretation facilities would give tourists access to a range of the scenic features of the park. Subject to the approval of the Aboriginal custodians, these trails would include guided access trails to certain Aboriginal sites.
— Tourists would be excluded from sites which the custodians felt they should not see or enter.
— Tourists wishing to visit areas other than those on the walking trails would need to register with management, both to safeguard Aboriginal sites and for the safety of the walkers in this remote area.

Regeneration Units

— Areas, subject to erosion, in which priority would be given to the regeneration of native vegetation.
— Priority would also be given to the control of feral animals.

6.4.2 Park Facilities Zone

This zone would encompass all the developed areas within the national park, and would comprise the following management units.

Park Administration Units

— This would include rangers' accommodation and office together with the park headquarters and any workshop facilities that would eventually be required.

Aboriginal Living Units

— This area/s would contain the housing and associated services and facilities required by the Aboriginal community, including an airstrip if necessary.
— Entry to this area/s would be restricted except with the permission of the community. All applications for entry would be referred to the community for their consideration.
— Road access would be provided for community and management purposes only.

Regeneration Units

— Areas, subject to erosion, in which priority would be given to the regeneration of native vegetation.
— Priority would also be given to the control of feral animals.

Tourist Facilities Units

— These would cover areas in which tourist developments were proposed and immediately adjacent areas. Such developments could include an airstrip, helicopter pad, low-key accommodation area,together with associated facilities.

Access Routes

— Road access corridors for vehicles within the national park would be controlled by the agency.

6.4.3 Aerial Access

Though not strictly a management zone, some consideration needs to be given to management of aerial access, both for safety reasons and to control the intrusion of aircraft noise. The following suggestions are made.

Flying Restrictions

— Vertical limits are required for aircraft over certain areas of the park such as Aboriginal living areas, airstrips and possibly other special management areas. Consistent with established flying regulations, a right-hand circuit over the massif should apply. Special provisions may need to be made for helicopter flights.

Landing Restrictions

— If necessary, landing restrictions could be applied to an airstrip in the Aboriginal living area which would in normal circumstances require community permission to land.

6.5 Regeneration of Degraded Areas

The nature and extent of the degraded areas within the proposed national park, the regeneration programme and the Department of Agriculture's concerns over funding, should the area become a national park, have been discussed in section 3.6. In view of the high intrinsic conservation value of these lands despite some areas being in a degraded state, the Working Group favours their inclusion in the proposed national park. It believes that the level of funding required for regeneration works would not be substantially changed by including these areas in the proposed national park. Funding for rehabilitation comes out of consolidated revenue, as do funds for park management; the breakdown is purely a function of administration. The Working Group believes that this funding could be directed towards either agency, that is, it need not be directed to the Department of Conservation and Land Management provided it is utilised for the purposes of rehabilitation to indigenous vegetation. There is considerable advantage perceived in utilising the equipment and the expertise within the Rangelands Management Branch of the Department of Agriculture in any regeneration programme.

Recommendation 4 — Regeneration of Degraded Areas

The Working Group recommends that:

4.1 the Department of Conservation and Land Management initiates administrative arrangements with the Department of Agriculture to ensure the allocation of funds and co-ordination of the ongoing regeneration programme, including the management and removal of cattle, to restore degraded lands within the proposed national park to indigenous vegetation utilising the expertise built up by the Rangeland Management Section of the Department of Agriculture; and

4.2 the Department of Conservation and Land Management advises the Board of Management of the proposed national park with respect to this programme.

6.6 Employment Opportunities and Training

Aboriginal traditional owners are seeking to return to their traditional lands for spiritual and cultural reasons. However, quite apart from these reasons, they wish to escape the severe social and economic conditions associated with life in large non-traditional communities and fringe settlements where employment opportunities are minimal, so that they may have an opportunity to lead better and more constructive lives and escape the demoralizing effects of long term dependency on social welfare.

The opportunity to return to reside with security on their traditional lands and the renewed strengthening of spiritual and cultural ties that this facilitates, will be important in building the self-esteem and confidence of the traditional owners. However, increased employment opportunities and the reduced dependency of the community on social welfare that results will also play a crucial role in their quest for a more meaningful life.

In the context of a national park on Aboriginal traditional lands, for which the traditional owners have a deep and ongoing attachment, it is considered appropriate that the traditional owners should be given opportunities for employment in the management of that land and its interpretation for the benefit of tourists.

At present, as discussed on page 52, the employment of traditional owners in jointly managed national parks in the Northern Territory is largely restricted to the normal ranger stream where they work alongside non-Aboriginal rangers. While there have been some difficulties initially in selecting appropriate people for training as rangers and with such things as the disparity of skills in reading and writing (particularly in Kakadu National Park where the ranger is typical-

ly tertiary qualified), the system has with some minor exceptions, generally worked. Most Aboriginal rangers are genuinely keen to be involved in the management of their traditional land.

The Australian National Parks and Wildlife Service (ANPWS), in Kakadu National Park, maintains close liaison with and involves the Gagadju Aboriginal Association extensively in Aboriginal employment matters. Because the Association is involved itself in the employment of Aboriginal rangers and sees their performance as a reflection on the image of Aboriginal people, it takes an active role in requiring performance from Aboriginal employees. Both the Gagadju Association and fellow Aboriginal rangers are understood to be critical of the apparent reluctance of ANPWS to dismiss Aboriginal rangers that are not performing to an appropriate level.

It is now being recognised that Aboriginal training and employment in national parks needs to be reviewed to broaden the range of employment opportunities available and make more use of the Aborigines traditional skills and cultural knowledge. These issues are discussed briefly on page 52.

It is not appropriate that the Working Group makes specific recommendations on the form that Aboriginal training should take. It is understood that the Department of Conservation and Land Management recognises the need for Aboriginal ranger training and is in the process of introducing such programmes. Clearly the Aboriginal training requirements should not be considered in isolation but as part of a regional or statewide training programme implemented by the Department of Conservation and Land Management. Such training programmes should be additional to the existing ranger training programmes set up primarily for non-Aboriginal staff.

The Working Group suggests that when formulating Aboriginal training programmes and employment policies there would be considerable value in maintaining close liaison with the development of training programmes and employment initiatives in other States.

In the context of the national park proposed in this Report, it is likely that relatively few employment opportunities for traditional owners would be available in the normal ranger stream, at least in the next few years. It is envisaged, however, that considerable potential exists for the employment of traditional owners in an interpretative role and in contract employment related to specific management, regeneration or development projects in the national park. The Working Group also believes that the traditional owners should have the first option on any proposed tourist operations within the national park on a leasehold or concessionaire basis.

Recommendation 5 — Employment and Training

The Working Group recommends that:

5.1 Department of Conservation and Land Management should aim to employ a balance of Aboriginals and non-Aboriginals in the proposed national park. Employment should aim to utilise the Aborigines' traditional skills and cultural knowledge for the benefit of park interpretation and management;

5.2 employment opportunities for Aboriginals should not be restricted to normal ranger positions, nor to permanent full-time employment. The possibility of contract employment for specific projects should be considered;

5.3 both Aboriginal and non Aboriginal employees, should be subject to the same dismissal clauses; and

5.4 in developing Aboriginal training programmes, close liaison should be maintained with those responsible for developing the training programmes in other States and especially in the Northern Territory. The structure and content of training programmes should be closely linked to and reflect the requirements of the position.

6.7 Aboriginal Outstation and Welfare Issues

Experience at Gurig and Kakadu National Parks (see page 50) has demonstrated the importance of Aboriginal traditional owners forming a legally incorporated body. This is normally a requirement before these groups can become eligible for Federal and State funding under various schemes and is, of course, necessary if the group wishes to control its own finances or take out loans for development.

In the absence of an incorporated body representing the traditional owners in Gurig National Park, the Conservation Commission of the Northern Territory has had to accept much of the responsibility for outstation development and welfare. The Working Group believes that it is not appropriate for the Department of Conservation and Land Management to be required to adopt this role. Rather it supports the development of self-management with assistance from Aboriginal resource organisations and relevant State and Federal Government agencies as necessary.

The Working Group recognises, however, that the Department of Conservation and Land Management has some responsibility as the managing agency, for ensuring that adequate funds be made available to facilitate effective Aboriginal participation in joint management. Furthermore, the Department, through the Board of Management, has a major role in planning for the location and development of outstations and associated facilities to ensure that they are compatible with park planning proposals and management objectives.

Funding needs are addressed more fully in section 8.

Costs associated with establishing and servicing the relatively remote community should be offset, at least in part, by the improved employment opportunities and reduced health problems associated with improved living conditions and fewer social tensions within the more traditionally based community.

Recommendation 6 — Aboriginal Outstation and Welfare Issues

The Working Group recommends that:

6.1 the Aboriginal traditional owners form a legally incorporated body should the proposed joint-management national park proceed. The Working Group recognises the role of Aboriginal resource organisations and various Federal and State agencies in assisting in the establishment of Aboriginal outstations. It believes that this is not a role that should properly be adopted by the Department of Conservation and Land Management. However the Department needs to ensure that the Aboriginal incorporated organisation is adequately funded to fulfil its role on the Board of Management.

7 TOURISM DEVELOPMENT CONCEPTS

7.1 Tourism in a National Park Context

The Working Group recognises in Bungle Bungle a spectacular and remote wilderness which possesses values of national and international significance, but which is fragile and easily degraded. In this context the conservation of these inherent values, upon which conservation, tourism and Aboriginal interests are based, is of paramount importance.

Visitor activities should be planned and adapted towards satisfying these primary objectives. The following statement, by the United States National Parks Service for its staff, was quoted in the International Union for Nature and Natural Resources (IUCN) publication, 'Planning for Man and Nature in National Parks'; it conveys this philosophy well:

"These lands (national parks) attract people because of the values which derive from the lands themselves. It is these values we use. It follows that the nature of the land normally should dictate the use. In natural areas this use is a simple viewing of the land qualities for their own sake, or the emotional association, patriotism or spiritual qualities they evoke".

The statement emphasises the need to plan in accordance with the inherent values and constraints of the land in question and so perpetuate these values, rather than to impose inappropriate development on the area. This philosophy is important, not only for the integrity of the national park, but also because the spectacular scenery, wilderness and heritage values of the national park also represent the base resource of tourism, the attraction that draws the visitors.

For this reason, there is a very close link (which is nonetheless often overlooked) between careful park planning and provision of adequate resources to manage and conserve nation-park values in perpetuity, and the need to maintain the quality of these basic natural and heritage resources upon which the tourist industry itself is dependant.

7.2 Access Options

The proposed national park at Bungle Bungle, due to its size and the diversity of landforms represented, has the potential to facilitate a range of tourism options, from short stops on organised tours to bushwalkers seeking solitude remote from development or disturbances. As has been noted on page 36, the growth in popularity of scenic flights over the massif has contributed substantially to the 600% growth in air charter business from Kununurra in the past year. In the period from January to September 1984, 270 scenic flights from Kununurra featured the Bungle Bungle massif as their primary attraction. Almost as many flights were booked in the period July to August 1984 as in the whole 1983-84 financial year (WA Tourism Commission pers. comm.).

Flying offers a spectacular perspective of the landforms in the proposed national park which is not attainable from the ground, enabling visitors to gain a better appreciation of the features, variety and scale of the Bungle Bungle massif. It has the advantage also of being the only means of seeing the area all year round.

Access to the massif from the ground enables tourists to obtain a close-up perspective, which in many ways complements the aerial perspective. A ground tour enables a detailed appreciation of its features, forms, texture, flora and fauna, and scale from a human perspective, and allows for a range of tour options from the short organised tour stop to bushwalking. It is not appropriate for vehicle access to attempt to duplicate the overall perspective of the massif that can be obtained from the air. Rather, the provision of vehicle access should be designed to provide tourists with access to a discreet range of features.

Importantly, in the context of joint management proposals for this area, ground access also facilitates the interpretation of elements of the traditional Aboriginal culture and mythology, and the manner in which it relates to the surrounding environment. This aspect of the proposed national park adds a significant new dimension to the scope and interest of the area as a tourist resource. It should also serve a significant educational function, enabling the tourist to appreciate and understand aspects of Aboriginal culture more clearly.

The Working Group believes it appropriate that tourists should be able to see the massif both from the air and the ground.

7.3 Development Considerations

The remoteness of the proposed park, the nature of the terrain and climatic considerations impose considerable constraints on tourist development.

At present vehicle access is only practical via two rough tracks from the west and north-west, leading off the Great Northern Highway. The track distances from the highway are approximately 80–100 km. The two tracks pass through distinctly different terrain, each with its own constraints in terms of road building and differences in scenic qualities.

The western access route, probably the most heavily utilised at present, passes through stable highly metamorphosed and tightly folded rocks forming a complex array of hills which have been dissected by an intense drainage network. Access via this route will inevitably require extensive cut and fill excavation and will follow a very twisty alignment with numerous inclines and creek crossings including major crossings of the Frank River and Fletcher Creek. Its point of entry to the valley west of the Bungle Bungle massif would require access across a severely degraded section of the Antrim Lowland land unit, a far from favourable first impression of the proposed national park. The access track from the north-west involves much flatter grades through the Osmond Valley. However, the route traverses less stable terrain involving numerous crossings of semi-permanent and permanent streams with steep clay banks which are already becoming seriously eroded. Much of the route along the valley bottom also traverses the same black clay soils, which rapidly break up into a fine dust when dry and become very boggy when wet. This surface would withstand very little traffic without major roadworks being required. It also passes through one of the more promising areas for mineral exploration, a fact which could potentially pose conflicts for access in the future.

All roads to the north, south and east of the Bungle Bungle massif must also traverse the Buchanan Sand Plain. Without a formed road surface these sandy soils will withstand only minimal vehicle traffic before breaking up. As no road building materials are available on the sand plain, extensive roads on this surface will involve long and very expensive leads to road building materials.

Providing upgraded access suitable for general tourist traffic along alignments based on either of the above-mentioned routes would require substantial road-works to construct a 6 metre wide formed, but not sealed, road, with formed creek crossings and culverts. A road of this standard, through the terrain involved, is estimated by the Main Roads Department to cost in the vicinity of $25,000/km. Even without allowing for upgrading of the station roads, from which the tracks to the proposed national park lead, the upgrading of either one of the tracks is estimated to cost in the order of one million dollars. Even so, vehicle access to the proposed park could be cut for 3 to 4 months of the year during most wet seasons and the roads would require potentially expensive maintenance work following each wet season.

A further potential option for road access would involve a road from the Duncan Highway. There are several problems with this option as well. Access from the Duncan Highway rather than the Great Northern Highway is a serious limitation, as most tourist traffic uses the Great Northern Highway rather than the unsealed Duncan Highway. The latter is also cut for several months of the year by the Negri River. Furthermore, access from this direction would necessitate crossing the Ord River, which would prevent access for several months of the year and require an expensive crossing.

The provision of aircraft landing facilities in conjunction with transport within the proposed park and limited upgrading of road access offers an interesting and cost effective alternative to major upgrading of road access. The establishment of package tours incorporating low cost flights into the proposed national park, is expected to be an important component in the success of this option.

This option is seen to have several major advantages. Most importantly it would facilitate tourist access to the park on a year-round basis. In the context of attempts to promote the 'Green Season', to increase wet season tourism and so even out the presently highly seasonal influx of tourists and make Kimberley tourist developments more viable,this concept may be particularly attractive. This is particularly relevant to the proposed national park, as it is at this time of the year, when the vegetation is green and rivers are flowing, that the area is at its most spectacular. Further, the development of such a concept maintains to a high degree the mystique of remoteness which is a major attraction of the area.

The cost of developing the proposed national park would be substantially reduced by this option and the park would be available year round. The cost savings in initial development are particularly significant when it is considered that an air strip serving the Aboriginal outstation will probably be necessary for health and emergency reasons anyway.

The rapid access made possible from regional centres such as Kununurra, Halls Creek and Turkey Creek as a result of the air-surface option makes it very attractive, particularly in

the initial years, to avoid the major costs and inevitable environmental disruption associated with the development of accommodation facilities and associated infrastructure in the park. It also permits a greater length of time to fully investigate the park's resources and evaluate the potential impact of developments on them.

Accommodation requirements under this option could be met by private enterprise within the existing regional centres of Kununurra and Halls Creek. The cost of establishing and servicing accommodation facilities in the national park, given the complete absence of any services and the remote location, would be very high and in many ways counter productive. Furthermore, without the year-round access made possible by the air-surface option the attendant costs of development would need to be recouped from tourist operations over a maximum of only 8 to 9 months of the year. Clearly, for the first few years the development of on-site accommodation is unlikely to be viable.

The Working Group recognises that one of the two existing access roads will need to be upgraded to facilitate transport of machinery and bulky items needed in the development of outstation facilities and park infrastructure and for subsequent servicing. This access route would facilitate vehicle entry during the dry season for the suitably equipped tourist. To cater for the needs of these people discreet low-key camping facilities should be provided. The type of facility established could also cater for the self-contained tourist arriving by aeroplane and, with the availability of camping equipment for hire, could be extended to cater for a wider range of tourists wishing to stay more than one day.

It is in part the remoteness and intrinsic wilderness values of the proposed national park that have captured the public imagination. While upgraded road access would to a degree diminish these values and do little to increase the diversity of tour options available in the Kimberley, the access concepts proposed are considered to add to the scope and interest of tour options available in the region. It is recognised that the industry is not presently geared to cater for the aerial access option proposed, however the rapid growth in the scenic flights in the past year is indicative of the speed with which the situation could change. In a region where ground access is often difficult, particularly during the wet season when many attractions become inaccessible to vehicles, aerial access may have wider application than is presently realised.

In the context of the joint management proposals, the working group considers the opportunity for the traditional owners to share in the economic benefits of tourism generated by the park, and to contribute to the tourism potential of the park, to be an important consideration.

The physical landforms of Bungle Bungle are a major tourist resource and will undoubtedly remain the primary tourist attraction. Aboriginal participation in the park's management, however, presents a significant tourism and educational opportunity for the interpretation and appreciation of traditional Aboriginal culture as it relates to this spectacular but harsh area. In so doing it would open up a whole new dimension to the park as a living environment which has supported and been actively managed by Aboriginal peoples for many thousands of years.

The level to which the traditional owners choose to be involved in tourism is a matter which is strictly up to them. However, a broad range of potential options, from direct participation and interaction with tourists, to a more indirect role in which elements of traditional culture or lifestyle are presented in interpretation facilities, is possible. The potential of Aboriginal culture as a tourist attraction is demonstrated in Kakadu National Park, where the superb rock art constitutes one of the park's major attractions. To date this aspect of the Kimberley regions tourism and cultural resource has been largely overlooked.

In formulating its recommendations for tourist development, the Working Group has recognised that tourists will be seeking a range of experiences tailored to fit their budget, time constraints and expectations.

The recommendations for tourist access and development proposed by the Working Group, are intended to facilitate access in the short term, while minimising disturbance to the environment and retaining maximum flexibility for long term options. They are not intended as detailed proposals, but concepts which could provide the basis for the development of long term access options in a subsequent detailed management plan.

Recommendation 7 — Tourism Development Concepts

The Working Group recommends that:

7.1 scenic over-flights of the proposed national park be regarded as an appropriate tour option for tourists on an organised tour, and for those otherwise constrained by time considerations. Various cost options based on flight duration, for example from Halls Creek, Turkey Creek or Kununurra, would be possible;

7.2 an air-surface tourist option should be facilitated by the construction of a landing ground on a suitable site in the park where it would not compromise scenic, conservation or Aboriginal values, and the provision of vehicle access to and from the landing ground to various scenic landscapes in the proposed national park;

7.3 an access track be upgraded to enable the supply of resources to the proposed national park and to facilitate vehicle access during the dry season for the suitably equipped tourist. The provision of upgraded road access to a standard suitable for caravan or coach-based tourists would be prohibitively expensive and is not considered feasible in the short to medium term at least;

7.4 discrete low-key camping facilities should be provided at a suitable location or locations near the periphery of the park. It is envisaged that these facilities would primarily cater for vehicle-based visitors, but they could also cater for self-contained air-surface tourists and, with the availability of camping equipment for hire, a wider selection of flying tourists proposing to stay more than one day;

7.5 subject to full investigation and analysis of park resources, detailed consideration could be given to the construction of a higher standard of facilities in detailed management plans to be prepared by the management agency in conjunction with the Board of Management;

7.6 access for private vehicles could be provided to a few scenic locations and interpretation facilities. Sightseeing beyond these areas would be by guided or self-guide walking tracks, with the option of an agency or concessionaire vehicle-based guided tour to more remote areas; and

7.7 the first option for the development of tourist facilities within the national park on a leasehold or concessionaire basis should be available to the traditional owners.

7.4 Interim Management

It is desirable that ground access to the area should continue to be discouraged until the long term future of the area has been resolved and a true management capability established. However, it is recognised that vehicle-based tourist access will not be effectively contained by the difficult access conditions during the 1985 tourist season.

In the event that a jointly managed A Class National Park cannot be proclaimed for the 1985 tourist season, it will be necessary to facilitate some on-site management capability and direct visitors towards the most appropriate areas without compromising park values, future management options or the needs of Aboriginal traditional owners. The Working Group considers that a minimum of two management staff should be based in the park during the first year. These positions should be additional to the presence in the park for extended periods of staff involved in the preparation of detailed management provisions and undertaking biological surveys.

Recommendation 8 — Interim Management

The Working Group recommends that:

8.1 as an interim measure the Study Area should be declared a C Class reserve for National Park at the earliest opportunity, so that a management presence can be established in the area and national park regulations applied over it;

8.2 a minimum of two management staff be established in the national park as soon as possible after the declaration of national park status;

8.3 work should be carried out to determine the appropriate location of access tracks and camping areas and to discourage access to inappropriate areas. Traditional owners should be involved in this process; and

8.4 ground access should not be improved until the future of the area is secure and a permanent management presence is established; however some interim management measures will be necessary to direct tourists to the most appropriate areas and so minimise damage resulting from vehicle-based access. This action should occur even before national park status is granted.

8 FUNDING REQUIREMENTS

8.1 Importance of Adequate Funding

The provision of adequate funding and staff resources is critical to the successful running of a national park; more so is the provision of funds and staff resources for jointly managed national parks. Funding requirements are relatively high, particularly in the initial years when the infrastructure associated with the reserve and the Aboriginal community is being established.

While the level of funding required may decline after the initial years as the development phase tapers off, depending on the nature and rate of development, it should be recognised that, commensurate with the national park fulfilling multiple functions, its management and administration costs will always be greater than those of a single function national park. Unlike such a park, this proposal includes an Aboriginal community as an integral component of the reserve. To a significant degree the well-being of the community will depend on adequate resources being made available for the management of the park.

The need for adequate funding is particularly apparent in the proposed park if it is to be capable of accommodating the already substantial tourist interest in the area without risking degradation of the resource. The funding and resources available to Kakadu and Gurig National Parks, while not necessarily comparable with that required for this park, serve to highlight the points made above.

The ANPWS budget for Kakadu National Park Stage I for the year 1983-84 totalled $2,120,000.

Comprising: $720,000 Operations budget
$900,000 Capital Improvements budget
$500,000 ANPWS staff salaries

The Park is staffed by approximately 40 employees of which eight are Aboriginal rangers. ANPWS are seeking an increase in resources so that they can adequately manage Kakadu Stage II when it is proclaimed.

The CCNT budget for Gurig National Park in the year 1983-84 totalled approximately $777,000.

Comprising: $310,000 Administrative Expenses
$186,000 Capital Works
$140,000 Salaries
$141,000 Ongoing Services

The park is staffed by eight permanent employees, including four Aboriginal rangers. In addition, several professional officers based in Darwin spend a considerable proportion of their time dealing with matters directly concerning Gurig National Park either in a planning capacity or through involvement on the Board.

Some of the costs associated with Gurig National Park reflect the difficulty of access, which necessitates that almost all of the park's needs are serviced by sea or air transport.

It should also be recognised that, while both Gurig and Kakadu are still in a development phase, many of the major development associated with the establishment of housing, equipment and other major infrastructure items have already been completed and do not contribute to these budgets.

8.2 Staffing Requirements

It is estimated that initially a minimum of two permanent management staff will be required in the proposed national park, with subsequent provision for additional park maintenance staff required soon after. When the area is established as a jointly managed national park there will also be a requirement for professional management staff (one initially) to be based on site. This position is critical to the success of the proposals; it requires a person with sensitivity and skills in the issues involved in joint management of a national park and sufficient standing in the agency to be empowered to make complex decisions. Professional regional staff and support facilities will also be necessary. The selection of appropriate staff is one of the critical factors in determining the success of joint management in the national park.

Employment opportunities and training priorities for traditional owners should be addressed as a priority in management of the park.

8.3 Park Planning and Development Needs

The combination of remoteness, difficulty of access, a fragile environment, rehabilitation requirements, high demand for tourist access and costs associated with joint management will make this an expensive park to establish and maintain.

It is estimated that the capital costs of establishing a permanent on-site management presence, providing upgraded access and associated facilities and undertaking a biological survey of the park and proposed additions, in the first year of national park status, will be in the vicinity of $675,000 to $725,000, based on the following breakdown:

$400,000	—	to establish a minimum of two management staff and associated infrastructure (housing, power, water, communication facilities,vehicles, etc).
$60,000	—	to provide short term accommodation and office facilities for visiting staff, consultants etc.
$100,000	—	to establish and maintain basic access and management tracks and facilities
$65,000	—	for a biological survey of the Bungle Bungle area and proposed additions to the park
$50,000-$100,000	—	contingency for the development of an aircraft landing field.

A detailed biological survey of the proposed park area and recommended additions to it is considered a priority in the first year. The survey is necessary to provide basic resource information on the flora and fauna of the proposed national park, as a prerequisite to sound management decision making. It is especially necessary with respect to this area because the south-eastern Kimberley region is one of the least known areas of Western Australia from a biological view point. The information provided will also constitute an important factor in determining appropriate boundaries to the recommended additions to the park.

Funding for the proposed park should be additional to the existing funding for national park management in Western Australia. Present levels of funding for this purpose are minimal and can not be expected to absorb the costs associated with the establishment of this additional major national park.

8.4 Establishment of Outstation Facilities, Aboriginal Incorporated Organization & Aboriginal participation in Joint Management.

The Working Group believes strongly that the responsibility for Aboriginal outstation facilities and welfare should not rest directly with the Department of Conservation and Land Management.

It is nonetheless an area requiring the adoption of a co-ordinated approach and a financial commitment from Government, at both State and Commonwealth levels. At the present time the various areas of funding responsibility are unclear and subject to change. A wide range of State, Commonwealth and Aboriginal agencies, however, could potentially provide funding or other assistance in various aspects.

In this context the adoption by the State Government of an approach to funding which entails a certain degree of flexibility to enable it to fill gaps left in funding by other agencies would be desirable.

The main responsibility for the Department of Conservation and Land Management is considered to be in adopting a co-ordinating and liaising role, to ensure that the proposed developments are planned in accordance with national park management planning proposals.

Should the Government decide to proceed with joint management proposals it is considered that resources will need to be provided to the traditional owners for the following purposes:

- to communicate Government decisions to the traditional owners and assist them to liaise with the State Government in the establishment of a joint-management structure;
- to assist the traditional owners create an incorporated Aboriginal Organisation, that will facilitate Aboriginal decision making. For the development of such an organisation Aboriginals will require the assistance of professionals such as lawyers and anthropologists;
- to assist Aboriginals develop an awareness and understanding of such concepts as national park, conservation and tourism and to acquire greater knowledge of national parks elsewhere, park management and park development alternatives;
- to discuss with Aboriginals proposals for ranger training and employment;

— to consult with Aboriginals about the development of a plan of management for the park; and

— to co-ordinate funding and other resource bodies that could potentially assist in the programmes outlined above.

As most of these functions are of a short-term nature, it is suggested that they may best be achieved by employing a person with appropriate skills, experience and credibility with Aboriginal people, on a short-term contract for one year specifically to undertake this role.

It is estimated that total costs including salary, vehicle purchase and maintenance, travel, accommodation, office, anthropological research costs and costs associated with organizing meetings of the traditional owners would amount to approximately $100,000.

Resources needed to enable the community to participate effectively in joint management, that is, an adviser capable of providing sound advice on park management issues and an educational training programme to facilitate an improved understanding of the concept of national parks, their functions and management, would be additional to this.

Agencies which could potentially provide funding or other assistance in aspects of this process include:

— Department of Aboriginal Affairs
— Aboriginal Development Corporation
— Australian Institute of Aboriginal Studies
— Aboriginal Sites Department — WA Museum
— Australian National Parks and Wildlife Service
— Department of Conservation and Land Management
— National Employment Scheme for Aboriginals
— Community Employment Programme
— Other Aboriginal Resource Organisations and Associations (Balanggari, Gagadju).

The likely costs involved in establishing outstation facilities are unquantifiable at present as they will ultimately depend on the number of traditional owners that decide to live on the National Park. Initial estimates suggest that approximately 100 people may return to settle on their traditional lands.

8.5 Regeneration Programme

As discussed on page 61, the Working Group recognises the expertise built up by the Department of Agriculture in regenerating these lands and favours the continuing involvement of this agency in regeneration programmes. It proposes that the allocation of funding for this work be determined administratively between the Department of Agriculture and the Department of Conservation and Land Management.Funding costs will relate to fencing needs, both erection and maintenance, to active vegetation regeneration works and to musters and aerial shoots to remove feral cattle and donkeys from this area to facilitate regeneration. This work is necessary whether the proposed park is proclaimed or not.

The Working Group is pleased to note that the Department of Agriculture, recognising the priority of fencing off the north-west bank of the Ord River, both for rehabilitation and conservation reasons in the context of a possible national park in this area, has modified its short term objectives for the regeneration programme to concentrate a major effort in this area in 1985-86 to fence off and destock the country by October 1986.

*Recommendation 9 — Funding Requirements**

The Working Group recommends that:

9.1 adequate funding be made available to establish, develop and manage the proposed national park. Adequate funding is critical to the success of the proposed park and it

*Footnote — Protection of Bungle Bungle

A recent report by the House of Representatives Standing Committee on Environment and Conservation recommended that the Commonwealth Government and Australian National Parks and Wildlife Service provide assistance to the State Government and traditional owners to help facilitate the establishment of joint management, ranger training programmes and to establish a National Parks management presence on site.

The Standing Committee's recommendations are shown as APPENDIX III.

is suggested that, if such funds are unlikely to be available, then other alternatives to the recommendations made in this Report may need to be considered. It is estimated that approximately $675,000–725,000 would be required for operations and capital improvements in the first year.

9.2 the provision of adequate funds from Aboriginal resource agencies and State and Federal Government agencies, to establish Aboriginal outstation facilities, an Aboriginal incorporated organisation and Aboriginal participation in joint management, should be considered a priority.

9 CONCLUSIONS

The Working Group recognised that the Study Area is of major conservation significance and has the potential to be a national park of possibly international significance. It also recognised that there are a number of other interests in the area, which should be considered in developing landuse and management options. It has, accordingly, developed innovative recommendations for the proposed national park to be jointly managed by the Department of Conservation and Land Management and the Aboriginal traditional owners. These management proposals, which break new ground in the field of natural area management in Western Australia, are considered to best cater for the multiple roles of the area.

The main thrust of the recommendations are tripartite, focusing on the conservation of the biotic, landscape and heritage resources of the area; the recognition of the deep ongoing relationship of the traditional owners to these lands and their requirement for social and economic security; and the high potential of the Study Area, notably the Bungle Bungle massif, as a tourist attraction.

In the context of this area, a jointly managed national park, combining conservation, Aboriginal and tourism interests is considered to offer multiple and mutual benefits.

— Aboriginal involvement in the proposed park offers the potential to add a significant new dimension to the scope and interest of the Bungle Bungle area as a tourist attraction. By opening up the possibility for interpretation of a wealth of Aboriginal cultural and mythological information, it enables the Bungle Bungle area to be seen not simply as a spectacular though harsh landscape, but as a dynamic living environment which has supported and been actively managed by Aboriginal man for thousands of years.

  Tourist interest in Aboriginal culture has been recognised in Kakadu National Park, where it constitutes a major tourist attraction, but as yet has not been widely recognised in Western Australia.

— National park management should benefit from Aboriginal participation, through gaining access to the extensive cultural and ecological understanding retained by traditional owners and their knowledge of the traditional land management practices applied in this region. The close association of the traditional owners with the park environment will also facilitate increased management awareness of the dynamic changes occurring in flora and fauna species population levels and so enable fine tuning of management practices. While Aboriginal hunting and gathering activities will have some impact on the park, particularly in the vicinity of the outstations, it will assist control of the feral cattle populations which are expected to be the main focus of hunting.

— The concept proposed would enable the traditional owners to return to reside on land which is culturally and spiritually significant to them and to participate in the management of the area. While it is clearly not envisaged that they would return to a fully traditional lifestyle, these proposals would enable them to return to a more traditionally based community structure and to retain the elements of Aboriginal culture which they consider to be important.

  Significantly the opportunity for employment in national park management and involvement, either directly or indirectly in tourism within the national park, offers the potential for the community of traditional owners to achieve a large degree of economic self-sufficiency in time.

The Working Group considers that the continuation, in a national park context, of the soil and vegetation regeneration works undertaken by the Department of Agriculture on river frontage lands degraded by pastoral use is necessary, if these areas are to effectively fulfil their important conservation function.

A number of areas, mainly peripheral to the proposed national park, have potential for minerals. National park status does not prevent mineral exploration; it does, however, require the application of conditions designed to minimise the impact of exploration and the application of appropriate regeneration techniques. There is a strong case, however, for excluding the Bungle Bungle massif and immediate surrounds from any future mineral exploration other than broad area mapping from a remote platform. This area constitutes an identifiable core area of the national park and focus of tourist interest. It is acknowledged to be of only minor mineral potential.

The Working Group has developed an innovative access concept, based primarily on access to the proposed park by air, with provision for ground tours within the park. Access to the park by private vehicle would be low key. This concept is intended to facilitate a wide range of sightseeing options to fit the budget, time constraints and expectations of visitors, while minimising the need for development within the park.

It is considered that aerial access and sightseeing is particularly appropriate in the context of this area, in which the form and diversity of the features and the sheer scale of the Bungle Bungle massif can best be appreciated from the air. It would enable tourists to perceive the spectacular features in their true perspective, to an extent which is not possible from the ground.

The emphasis on aerial access and sightseeing at moderate cost removes the need to develop an extensive and environmentally undesirable tourist road network to and within the park, where the fragile terrain dictates that a high standard of vehicle based access would be expensive to provide and could not be readily maintained year round.

A number of other advantages also flow from the emphasis on aerial access to Bungle Bungle. The concept adds to the diversity of the tourism package offered by the Kimberley region and maintains a degree of the mystique of remoteness, which is one of the attractions of the area.

It would also enable access to the park to continue through the wet season when, with green vegetation and rivers flowing, the Bungle Bungle area is at its most spectacular. In so doing it adds a major attraction to the Kimberley features accessible during the 'green season' and may encourage tourism at this time of year.

Importantly, aerial access would enable rapid access from the established regional centres, minimising the need to provide accommodation and other services in the national park and maximising the opportunities for private development in the regional centres, with substantial savings in development costs and reduced environmental impact.

The establishment of a range of package tour options incorporating low cost flights into the national park are expected to be an important component in the success of this option.

This Report does not purport to be a management plan for the area concerned, rather its purpose has been to develop concepts for its future purpose, vesting and management.

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APPENDIX I

Aboriginal Decision Making at Turkey Creek

(extract from Decision Making, Turkey Creek by N. Williams (1984). In Warmun Community — A response to the Aboriginal Land Inquiry 1984.

The primary focus throughout this section is on decision-making marked by the following three factors:

1. An outcome (decision, answer, resolution, or the like) is defined and/or required by an outside, non-Aboriginal agency, and, usually, by one that has some power to compel;
2. the issue bears on a specific geographic area, generally the area of which the Bungle Bungle massif is a central feature; and
3. Aborigines involved are those normally resident (at the time of writing) at Turkey Creek, outstations from Turkey Creek, as well as others at stations, camps, reserves, towns, etc, within a radius of approximately 250km from Turkey Creek.

Discussion of the process of decision-making at Turkey Creek is based on observations of meetings, including community meetings, council meetings, extended-family meetings, and the communication of information stemming from those meetings among individuals in pairs or in small groups. Our focus here is on issues defined by the resident community advisor (a non-Aboriginal Australian), or by other non-Aborigines from outside the community and subsequently explained by the community advisor to the meeting.

The community advisor introduces the topic and defines the issue(s) about which an outside agency requires or requests decision, or the other non-Aborigine introduces it and the community advisor explains it further. He indicates who seeks or requires the outcome, the purpose for which the outcome is required ("why" the decision is sought), when it should be made (the existence of a "deadline" or the like), and the form in which the outcome should be stated — that is, as an expression of the Council's will or opinion, the wish of the community or of a language-labelled group, or other such social entity.

Following presentation of the topic or issue with respect to which a decision is to be made, the next phase is marked by the emergence of the person who is the appropriate one to communicate the issue to the relevant decision-makers. With respect to the Bungle Bungle area, this is likely to be one of the senior men in the group associated with plans to develop an outstation in that area (Raymond Wallaby in the first instance; others in his family and among those who recruit themselves as his supporters in that venture). This senior person may not himself contact all the decision-makers, but he will be responsible for seeing that messages are sent to him.

An issue that concerns the Bungle Bungle area is likely to involve virtually all the residents of Turkey Creek, or may do so, depending on how widely or narrowly the issue is defined. Furthermore, it is likely to include people who usually live in Kununurra, Wyndham, Halls Creek, but is not limited to people in those places; it may also include people in surrounding stations and outstations. At least three factors come into play in determining the range of the persons likely to be involved in making a decision in a matter related to the Bungle Bungle area: it is an area where the interests of several groups of people converge. These are people who have joint interests in the nature of ownership (or some form of control over land and/or resources), and whose group interests converge geographically there in ways suggesting that unresolved issues of boundaries exist — at least boundaries defined in terms of language-labelled groups (specifically Kija, Miriwung, Malgin, and Jaru). Second, demographic factors, especially major disruptions, dispersals, and high mortality rates throughout the proceding one hundred years have resulted in gaps or dicontinuities in links between groups of people and their interests in land. While not new phenomena for Aborigines here (or anywhere else for that matter), it is very likely that they occurred during that period with greater magnitude than before European incursions into the Kimberleys. Third, related to the effects of white occupation of the East Kimberley, are questions of Aboriginally-defined rights of succession to interests in land in the area. These rights and interests are subject to current and on-going negotiations among Aborigines in the Turkey Creek area.

The person who has emerged as the manager of the process in the next phase of decision-making will likely direct the process of communication toward the outcome. He is responsible for locating the "right-people" and discussing with them the issue to be decided, that

is, with talking with the right people himself or sending messengers to do so, and with getting responses. He negotiates discussions between and among other decision-makers toward the end of creating a consensus — or at least of adjusting all strongly expressed opinions and/or interests so that they are reconcilable. At Turkey Creek — as in other Aboriginal communities — important issues, including most notably those involving land, may be characterized by some degree of contention. The contentiousness may be expressed in overt disputation, which must be resolved (or muted) before discussion and negotiation of the issue can proceed. In the process of dispute resolution, the role of mediator is clearly defined. We have recorded the term *tilaj* in the context of disputes about interests in land, but are as yet unable to gloss (define an English equivalent) it satisfactorily.

When the person who has been directing the process of decision-making toward a consensus judges that a nominal consensus has been reached, he convenes a meeting where the central decision-makers are present as well as those who will "witness for" or keep the account of the decision and the form of the consensus that was reached (the "standing account"). Others who expressed no strong interest in the issue or its outcome, and still others with minor interest but no express desire to press it, may also be present. Even those with no immediately definable interest in the issue may attend simply to observe the proceedings and hear the outcome. (It is difficult however to imagine any issue involving land that does not touch at least tangentially some interest of every member of the community).

This meeting serves the purpose of making the outcome a matter of "public record". It also provides the opportunity for persons still holding reservations concerning the outcome to state their reservations and thus have them also a part of the public record. The outcome is then formulated in terms that are appropriate to the agency that put the issue to the group in the first instance. At this point the community advisor, or some like person, is usually involved and his (or her) involvement continues through the process of communicating the decision to the agency that requested it.

Although the phases of decision-making outlined above most often occur in the patterned sequence outlined above, truncation may occur, as may compression, and the people involved still be satisfied that a valid outcome has been achieved. Again, however, it must be emphasized that unless at least a nominal consensus has been achieved, one to which every person who declares some interest has had an opportunity to contribute and one to which every person nominated by another active decision-maker as a necessary contributor has had an opportunity to contribute, the Aboriginal people involved will regard the issue as undecided and inconclusive. That is, until a consensus has been formed, no decision has been made. The time involved in that process may be very long indeed.

APPENDIX II

People Spoken to in the Northern Territory.

Conservation Commission of the Northern Territory

T. Dacey	Deputy Director
R. Hooper	Executive Officer — Forestry and member of the Coburg Board
M. Butler	Planning — Northern Region (responsible for Coburg)
J. Wood	Regional Manager — Resource Planning Unit, Northern Region
D. Smythe	Training Officer
R. Davis	Acting Regional Executive Officer — Parks & Wildlife
B. Fox	Regional Manager — Parks & Wildlife
E. Sandrey	Chief District Ranger — Coburg Peninsula
P. Howser	Ranger — Coburg
K. Duggan	Soil Conservation Officer — Land Conservation Unit
L. Beens	Head — Resources Planning Unit

Aboriginal People of Coburg Peninsula (Gurig National Park)

N. Muluring	Member of the Coburg Board
H. Yameri	Ranger in training
T. Munguwalu	Park assistant
C. Namabil	

Northern Land Council

K. Dunn
D. Baker

Australian National Parks & Wildlife Service

C. Haynes	Regional Director
I. Morris	Training Officer — Kakadu
A. Carter	Superintendent — Kakadu
B. Gall	Deputy Superintendent
R. Pink	District Ranger in Charge — Jim Jim
P. Pink	Social Planner (Canberra)

Gagadju Association

D. Lindner — Environmental Advisor

Department of Aboriginal Affairs

G. Whelan

International Studies

S. Weaver — Professor of Anthropology, University of Waterloo, Ontario — Canada

APPENDIX III

Protection of Bungle Bungle — Recommendations from Report from the House of Representatives Standing Committee on Environment and Conservation. March 1985.

RECOMMENDATIONS

The Committee recommends that:

1. the Commonwealth Minister for Aboriginal Affairs discuss with his State counterpart assistance required from the Commonwealth to enable the Warmun Community to be provided with -

   - advisory staff to gather information and coordinate meetings with traditional owners;
   - funds to enable access to experts in areas of park management, law and anthropology, and
   - funds to enable traditional owners to meet and make informed decisions. (paragraph 35)

2. the Australian National Parks and Wildlife Service in consultation with relevant Western Australian authorities and the Warmun Community offer assistance in developing Aboriginal training programs for the traditional owners.

   (paragraph 39)

3. the Australian Government provide assistance to the Western Australian Government under the States Assistance Program.

   (paragraph 44)

4. the Commonwealth Government discuss with the Western Australian Government the provision of funds to enable -

   - the stationing of rangers in Bungle Bungle during the visitor season; and
   - the commencement of essential minimum capital works.

   (paragraph 49)

5. the Australian Heritage Commission in consultation with the Australian National Parks and Wildlife Service and relevant Western Australian State Authorities undertake investigations to establish the national and international significance of the Bungle Bungle region.

   (paragraph 50)