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**House of Representatives
Standing Committee on
Environment and Conservation**

**Report on
Ayers Rock-Mount Olga
National Park**

NOVEMBER 1973

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REPORT

1. The first part of the report discusses the general situation of the country and the progress of the work during the year. It also mentions the various projects and the results achieved.

2. The second part of the report deals with the financial aspects of the work, including the budget and the expenditure. It also mentions the various sources of income and the results of the financial management.

3. The third part of the report discusses the administrative aspects of the work, including the organization of the staff and the results of the administrative management.

4. The fourth part of the report discusses the technical aspects of the work, including the various projects and the results achieved. It also mentions the various sources of information and the results of the technical management.

5. The fifth part of the report discusses the social aspects of the work, including the various projects and the results achieved. It also mentions the various sources of information and the results of the social management.

RECOMMENDATIONS

The Committee recommends:

1. That a comprehensive management plan for the Ayers Rock-Mount Olga National Park be implemented as soon as possible.
2. That the Park be broadly zoned into:
 - (a) areas of intensive usage, chiefly in the area of Ayers Rock itself;
 - (b) areas of some restriction that could be developed progressively to take pressure off Ayers Rock itself;
 - (c) essentially wilderness areas, where access would be very restricted or prohibited; and
 - (d) sacred and other areas under direct Aboriginal control, and to which access will be given only on terms and conditions determined by Aboriginal trustees.
3. That the existing village and airstrip be resited outside the present National Park boundaries to minimise adverse environmental and aesthetic effects adjacent to Ayers Rock.
4. That roads be sited in the interests of minimising environmental damage rather than maximising tourist convenience. The road which presently encircles Ayers Rock be moved out some distance from its base and spur roads be constructed where necessary.
5. That opportunity be provided for Aboriginal involvement in the following ways:
 - (a) participating actively in the management of the Park;
 - (b) maintenance of existing cultural features such as the decorated caves;
 - (c) construction and maintenance of National Park facilities;
 - (d) provision of information, guide and travel services;
 - (e) teaching white people of Aboriginal tradition and involvement at Ayers Rock;
 - (f) selling Aboriginal artifacts;
 - (g) displaying indigenous plants and animals in a natural setting;
 - (h) provision of a camp site within reasonable distance of Ayers Rock; and
 - (i) exclusive usage of Ayers Rock for certain ceremonial purposes at times to be negotiated.
6. That the 'carrying capacity' of the Park be established and visitor numbers restricted to this limit. In peak periods visitors be admitted only on guided tours. The Park be closed at night. The use of firearms be prohibited except for official use. Motor vehicles to be used only on designated roads.
7. That all existing concession holders at Ayers Rock be compensated and given priority in allocation of land at a new village site if they wish.
8. That interpretation of cultural, historical and scientific features take place, involving Aboriginals where appropriate.
9. That the Park be adequately and professionally staffed and financed to meet the objectives outlined.

10. That measures for the restoration of areas which have been environmentally damaged be adopted.

11. That Park boundaries be extended on the basis of ecological requirements and should include the area known as the 'Sedimentaries'.

12. That the Park be declared a 'National Heritage Area' to signify its importance for both whites and Aborigines and to indicate its protected nature and purpose.

1. INTRODUCTION

1. On 31 May 1973 on the motion of the Hon. Moss Cass, M.P., Minister for the Environment and Conservation, the House of Representatives resolved:

That a Standing Committee be appointed to inquire into and report on:

- (a) environmental aspects of legislative and administrative measures which ought to be taken in order to ensure the wise and effective management of the Australian environment and of Australia's natural resources; and
- (b) such other matters relating to the environment and conservation and the management of Australia's natural resources as are referred to it by:
 - (i) the Minister for the Environment and Conservation; or
 - (ii) resolution of the House.

2. On the same day the Deputy Speaker informed the House that Dr H. A. Jenkins, Mr J. C. Kerin, Mr A. H. Lamb and Mr R. H. Sherry had been nominated as members of the Committee by the Prime Minister; that Mr J. W. Bouchier and Mr E. M. C. Fox had been nominated by the Leader of the Opposition, and that the Hon. I. L. Robinson had been nominated by the Leader of the Australian Country Party.

3. In a letter to the Committee dated 31 May 1973 the Minister for the Environment and Conservation, the Hon. Moss Cass, M.P., referred to the Committee a number of matters for possible inquiry and report. Included was:

In national parks, the conflict between their management as conservation areas and fauna reserves, and their use for tourist purposes. The Committee might look into cases of such conflict as the present situation in the Ayers Rock-Mount Olga National Park and in the Great Barrier Reef, in order to suggest management guidelines for the development of adequate tourist facilities in such areas, whilst maintaining their quality as conservation areas and wildlife reserves.

4. The Committee at a meeting on 13 June 1973, resolved that an immediate inquiry should be carried out into the conflicts that arise from management of the Ayers Rock-Mount Olga National Park in the Northern Territory as a conservation area and fauna reserve and its use for tourist purposes.

5. The inquiry was considered a case study with the view that many guiding principles could be established which would have application in other national parks. The Committee was conscious that being situated in the Northern Territory the area came under the direct control of the Australian Government. It was also aware of the desirability for the Government to set an example in park administration.

6. The Committee held public hearings in Canberra at which witnesses from the Departments of the Environment and Conservation, Aboriginal Affairs, Northern Territory, Tourism and Recreation, the Australian Tourist Commission, the Northern Territory Reserves Board and Professor J. D. Ovington, gave evidence.

7. The Committee made an inspection of the Ayers Rock-Mount Olga National Park between 21 and 24 July 1973. At the same time informal discussions were held with interested individuals and groups representative of tourist interests, conservation, national park management and airlines, both at the National Park and in Alice Springs. Subsequently a Sub-committee visited Mimili, Ernabella and Docker River to hold discussions with elders of the Pitjantjatjara tribe, who have a traditional association with Ayers Rock.

8. The Committee also had available to it a number of reports commissioned by a previous government including:

- (a) J. D. Ovington, K. W. Groves, P. R. Stevens and M. T. Tanton, *A Study of the Impact of Tourism at Ayers Rock-Mount Olga National Park*, Canberra, 30 September 1972;
- (b) Harris, Kerr, Forster and Co., *Ayers Rock-Mount Olga Development Plan*, 1969;
- (c) Kinnaird, Hill, de Rohan and Young Pty Ltd, *Ayers Rock-Mount Olga National Park Economic Evaluation*, September 1972; and
- (d) Arid Zone Research Institute, *Ayers Rock-Mount Olga National Park Environmental Study*, 1972.

9. The Committee sought permission from the Speaker for Professor J. D. Ovington, Head of the Department of Forestry, Australian National University, to be appointed as an expert adviser. This was approved. Professor Ovington accompanied the Committee during a visit to Ayers Rock and its environs.

10. A significant fact to emerge from the Committee's inquiry was the great number of reports on various aspects of Ayers Rock-Mount Olga National Park development and the lack of practical action resulting from them. This, despite the need stated in the reports for immediate action to prevent further environmental deterioration, and for rational planning and active Aboriginal involvement.

11. The Committee, in view of the urgency of the situation was unwilling to issue another report, indicating broad generalised objectives, aims and recommendations. Therefore the Committee has approached its task by dividing its Report into two main sections: the first is an outline of the characteristics of the Park, its management and the conflicts that exist between environmental, tourist and Aboriginal needs. It outlines what appear to the Committee to be the principal issues that have arisen from the inquiry, and sets down the basic aims that it is believed the Park should be achieving. In addition a number of broad principles on national park management are propounded that have application for national parks generally. The second section is Appendix B to this Report. In order that the Committee does not merely pose questions, a Draft Management Plan has been prepared at its request by Professor J. D. Ovington. The Plan gives effect to many of the Committee's aims as outlined in the body of the Report.

12. While not wishing to attenuate the importance of the area for traditional Aboriginal association, it is the Committee's firm belief that Ayers Rock has become a symbol of national significance to all Australians. It conveys a sense of Australia's vast size, aridity and distance. The Committee believe that as Australians become more consciously urbanised, the significance of what has been called 'the outback experience' will increase.

13. It is of the utmost importance from the Committee's point of view that the area is utilised by the maximum number of Australians who can do so, without causing environmental damage. There is evidence that the present level of visitor usage and that predicted for the future, will in the absence of new management procedures, cause a serious breakdown in both the environmental and the scenic attraction of the area.

14. The Committee is conscious of the suggestion in the Prime Minister's election policy speech that the Government will:

Invite the governments of West Australia and South Australia to join with the Commonwealth in establishing a Central Australian Aboriginal Reserve (including Ayers Rock-Mount Olga) under the control of Aboriginal trustees.

15. The Committee is also aware that Mr Justice Woodward's Aboriginal Land Rights Commission is still deliberating. It believes, however, that it is essential that plans to protect Ayers Rock and its environs from over-use be implemented immediately, and should not await the outcome of these deliberations.

16. The Ayers Rock-Mount Olga National Park exists to protect scenic and geological features, Aboriginal cultural features and traditions, the complex arid zone ecosystem, whilst providing for recreational and educational use, scientific study and wilderness experience.

17. However, the rapid growth of tourism and the by-products of it, in the form of roads, the airstrip, motor vehicles, motels, hotels and campsites, and the simple impact of large numbers of people on a delicate ecosystem, have all contributed to a deterioration of many parts of the Park, particularly in the area adjacent to Ayers Rock itself.

2. NATURAL CHARACTERISTICS OF THE PARK

General

18. Ayers Rock-Mount Olga National Park is located in Central Australia about 450 land kilometres and 321 air kilometres south-west of Alice Springs. The Park covers 1261 square kilometres, measuring 13 kilometres north-south and 72 kilometres east-west, and largely comprises low parallel ridges of red sand interrupted by flat open areas and the principal features of Ayers Rock and the Olgas. To the west of the Park lie the Petermann Ranges in the Aboriginal Reserve from which the Park was excised in February 1958, when it was dedicated to the Northern Territory Reserves Board. Other features of the area surrounding the Park are Mount Conner, over 300 metres high and about 80 kilometres to the east of Ayers Rock and Lake Amadeus, an extensive salt plain 32 kilometres to the north.

19. The red earthy sand of the Park forms reasonably stable ridges with minor areas of mobile sand. The depth of soil averages more than one metre and although rated as being of low to moderate fertility, the sparse vegetation of the region places little demand on the available nutrients. Tussocks of Spinifex grass provide a uniform coverage throughout the Park and other grasses and shrubs are common. Desert poplars and oaks are found throughout the Park, while Mulga and Witchetty bush are prevalent and Desert mallee grows in areas between Ayers Rock and the Olgas. In the immediate vicinity of Ayers Rock, dense stands of Bloodwood and Sandalwood grow in the watercourses and wet areas created by the heavy run-off from the rock surface during rain, while further out towards the limits of the run-off area, Ironwood and Beefwood trees are present. River red gums grow in the watercourses leading from the Olgas. A total of 137 different species of plants in 41 groups have been recorded in the Park, most of which occur in some abundance around Ayers Rock and the Olgas where the drainage effects of the vast rock surfaces are apparent.

Ayers Rock

20. Ayers Rock is composed of arkose, a feldspar-rich sandstone which is light grey in colour but turns red-brown through oxidation when exposed to the elements.

It is this oxide coating which provides the unique scenic qualities of Ayers Rock. The summit is 348 metres above ground level and 875 metres above sea level, with an overall length of 3.6 kilometres and a width of 2.4 kilometres. It covers approximately 486 hectares and is about 9 kilometres around the base. The greater part of Ayers Rock lies below the surface and the Bureau of Mineral Resources, in 1965, mapped its overall depth at 2438 metres. The surfaces of Ayers Rock vary from smooth to heavily pitted, with several large caves worn into the sides at ground level and a large number at inaccessible heights. Some of the deeper holes worn in the top of Ayers Rock hold rain water throughout the year. Ayers Rock weathers by a process known as spalling, whereby flakes of rock break away from the surface.

The Olgas

21. The Olgas, located 32 kilometres west of Ayers Rock provide a striking contrast to the single mass of Ayers Rock, with domes of varying heights, valleys, clefts and ridges, covering 35 square kilometres and dominated by Mount Olga at a height of 546 metres above ground level. The Olgas also differ from Ayers Rock in that they are composed of a conglomerate of sandstone of varying shades and textures. The conglomerate weathers by the composite stones breaking away from the conglomerate and forming loose masses of boulders around the base of the domes that has the effect of making access to most areas by vehicle extremely difficult.

22. As is the case at Ayers Rock, the effect of drainage from the Olgas is immediately apparent from the air, as vegetation is less sparse in the surrounding areas and numerous major watercourses can be seen spreading outwards from the valley entrances and the rock faces.

Climate

23. The park is classified as arid with an annual rainfall of between 6 inches and 8 inches. Daytime temperatures exceeding 38°C are common in summer, and winter temperatures average about 20°C with an average relative humidity of 30% and a very high rate of evaporation. It is believed that Ayers Rock was once an island in a lake and the soil around the base is the sediment which was deposited on the floor of the lake. It is this 55-metre layer of sediment lying on the base of arkose which absorbs the flood of rainwater from the rock surfaces, providing the water sources currently being exploited.

Fauna

24. The status of fauna prior to European settlement is not well documented. However, evidence given to the Committee indicated that the probable number of species existing was 37 mammals, 97 birds and about 60 reptiles. Since settlement, some species are probably extinct and many have become rare.

25. The advent of stock and rabbits onto the rangelands created competition for native herbivores. Grass shelter used by such species as the Hare wallaby and Pig-footed bandicoot disappeared, making them more prone to attack by foxes and cats. More recently the number of species and the areas they occupy have been reduced by tourist activity and to a lesser extent by indiscriminate collecting. Appendix C lists rare and endangered species, probably extinct mammal species and mammal species most likely to be observed by visitors.

26. Many of the mammals present are restricted to a particular habitat for sheltering, breeding and feeding purposes. These would include bats, the Rock

wallaby and the Euro. Some, such as the Red kangaroo, shelter in mulga during the day and feed on more open areas at night. Rodents and mice tend to reach plague proportions in good seasons and to decline to the point where they are undetectable in bad seasons. Dingoes exist in significant numbers.

27. Most birds of the Park are restricted to areas with some vegetative cover. Exceptions are hawks and eagles which occur over all habitats, and emus which cover extensive areas. Alluvial fans with associated vegetation north and north-east of the Mount Olga complex, represent unique areas for certain ground and scrub birds, since most similar areas in Central Australia have been damaged by grazing. Mallee associations are small in size but represent habitats for some species.

28. Reptiles occur in the entire range of habitats, but in greater abundance and diversity in the red sand and grassy flat associations and least on stony outcrops and foothill areas.

29. The invertebrates that exist in the Park have not been recorded.

30. Little is known about the status of most of the Park's fauna. In many cases only the presence of animals and their taxonomic status are recorded, in others simply that an animal might exist. Many animals are either nocturnal or occur naturally in small numbers in restricted habitats, or only occur in observable numbers after a run of good years. For these reasons from the tourist point of view, wildlife is not much in evidence.

3. TOURISM AND ITS IMPACT

31. The extent of recreation and tourist use at Ayers Rock-Mount Olga, threatens the existence of the Park in its most desirable form. The number of visitors has increased from some 4,332 in 1960-61 to an estimated 62,850 in 1973-74. This indicates the increasing importance of Ayers Rock as a tourist attraction and the rapid growth rate of visitor numbers:

<i>Year</i>	<i>Number of visitors to Ayers Rock-Mount Olga National Park</i>
1966-67	18,963
1967-68	21,515
1968-69	23,051
1969-70	27,450
1970-71	30,201
1971-72	42,705
1972-73	50,287
1973-74 (estimate)	62,850

32. Ayers Rock is now an important destination for overseas tourist traffic and for rapidly increasing domestic tourism. Travel bodies feature Ayers Rock extensively as a tourist attraction and a great deal of general publicity is given to it.

33. Studies of visitors to the Park indicate that the average length of stay is only two nights, and that in most cases the visit to Ayers Rock forms only a small part of an extended tour throughout Central Australia. It has been suggested to the Committee that a typical winter program at the Park would involve half a day at

the Olgas, half a day climbing Ayers Rock, half a day around the base and one evening viewing the sunset at Ayers Rock. Such a program would seem to the Committee to be the minimum in which to gain an appreciation of the grandeur of the region and of ecological and environmental aspects of the Park.

34. The composition of visitors to the Park that is of relevance in planning is:

- 28% of visitors are 45 years of age or over
- 8% of visitors are 65 years of age or over
- 29% of visitors are on student holiday
- 60% come by bus
- 17% are from overseas
- 24% use hotel and motel accommodation.

35. There is no doubt that the increasing numbers of tourists have had a detrimental effect on the environment, and that people's enjoyment of their experience at Ayers Rock is being decreased. Apart from the volume of visitors, there are a number of other factors that are playing a part in damaging the environment of the Ayers Rock area and diminishing its aesthetic appeal. These can be summarised as:

- (a) the site of the village;
- (b) the presence of an airstrip at the base of Ayers Rock; and
- (c) the location of existing roads.

36. The present 'village' is located on the eastern side of Ayers Rock. It comprises a number of scattered motels, lodges and campsites, and has a capacity of about 1,800 people.

37. The village itself is unattractive aesthetically due to its almost totally unplanned nature. This is accentuated by the varying standards of accommodation and the large numbers of campers and their attendant possessions and washing. It results in visitors wishing to view Ayers Rock from the east having to do so through a screen of buildings and structures that detract greatly from the overall experience.

38. Apart from the structures themselves, the fact that there are always the presence of large numbers of people near the village and campsites, reduces the feeling of isolation and grandeur.

39. Major problems associated with servicing the village are: inadequate accommodation; sanitation; water supply; waste disposal; paths and roadways. Considerable damage to the environment in the near vicinity of Ayers Rock has been caused by access roads, water lines, car parking areas and pathways trampled through the vegetation by large numbers of tourists.

40. Water supply is from bores, but even when operating at full capacity these are barely adequate to meet the present tourist demands and have been known to fail in times of drought. A large number of test bores have been sunk throughout the Park with limited success. Much of the water found has been saline, and treatment costs would be prohibitive. The only available supply of fresh water in the area is 129 kilometres north-east of the Park in the George Gill Ranges.

41. Waste is collected in large open drums that are then picked up by trucks and emptied from these into pits and graded over. This treatment is inefficient since little crushing is employed and large areas of land are denuded of vegetation for relatively small amounts of waste disposal. Regeneration of these areas occurs to only a limited degree.

42. Sanitation is by a septic system. The number of toilet blocks available in the camping areas is grossly inadequate during the peak season, presenting a very real health hazard.

43. Paths are almost non-existent and those that do exist cannot cope with the large groups of tourists and cause overflow onto the surrounding vegetation. The siting of many existing paths interrupts natural drainage patterns and is causing erosion.

44. At the observation points on the ridge of natural sandhills, where tourists arrive in large numbers to watch the reflections of sunrise and sunset on Ayers Rock, particularly those areas known as 'sunrise' and 'sunset' dunes, extensive damage has been caused to the vegetation and sandhills. Tourists climb the sides of the sandhills, dispersing the sand formation and destroying the grasses and shrubs that bind them. Severe erosion is evident.

45. Related directly to the siting of the village is the location of the airstrip which is a short distance out from Ayers Rock at its north-east corner. The airstrip is used by charter companies flying regular services to Ayers Rock from Alice Springs, as well as by substantial numbers of private aircraft. It has the obvious advantage of providing very easy access to Ayers Rock, but has many disadvantages:

- (a) in its present position, the strip is extremely dangerous due to the turbulence encountered close to the ground;
- (b) the airstrip is unsightly because of its location so close to Ayers Rock concentrating people and facilities there;
- (c) the ancillaries to the strip and the scar that it makes on the landscape, mar the attractiveness of the area;
- (d) the strip interferes with natural drainage patterns and has an adverse effect on surrounding vegetation; and
- (e) the strip frequently becomes inoperable after rain.

46. One related factor that causes annoyance is the engine noise of aircraft that frequently fly low over both Ayers Rock and the Olgas.

47. None of the roads in the Park is sealed. Traditionally they have been constructed to maximise convenience without paying regard to environmental effects. This is demonstrated by the road that circles Ayers Rock as close as possible to its base. While it provides easy access, it has disturbed natural drainage patterns and led to the killing off of a large number of Bloodwood trees and other vegetation. In addition it separates Ayers Rock from 'Little Ayers Rock', an Aboriginal site of significance.

48. The road is visually unattractive and leads to a great number of buses and other vehicles parking very close to Ayers Rock. The same principle of convenience has dictated the location of all other roads in the Park, and there is a clear need to organise a planned road network to minimise environmental effects and intrusion into natural areas.

49. Another problem concerns the increasing use of all terrain vehicles (A.T.V.) in the form of motor cycles and four-wheel drive vehicles that are used for off-road travel. These have the effect of creating tracks where none previously existed and this encourages others to follow in the same route, resulting in a proliferation of tracks and widespread degradation of the environment.

50. Another problem arises from the seemingly innocuous practice of collecting firewood for campfires. Collection within the Park occurs despite its prohibition. Most collection takes place just outside the Park boundary. The practice interferes with the natural ecological process, and as tourist numbers increase availability near the Park will be reduced considerably, and serious environmental damage is likely to occur.

51. The lack of management controls and full-time supervision by rangers, leads to extensive vandalism at Ayers Rock and surrounding areas. The sacred cave paintings are often defaced, names are chipped into the rock face, trees damaged and waters of the natural ponds polluted with human waste. Apart from this wilful destruction, considerable environmental damage is caused by the trampling of vegetation and earth formations, extensive littering, fires and the creation of unnecessary noise that is affecting wildlife in the area.

52. Tour coaches arrive at any hour of the day and a number may begin their tour of the Park at the same time, causing gross overcrowding of higher interest areas.

53. One further by-product of tourism and settlement is the presence of feral animals such as dogs and cats. Cats in particular pose a serious threat to some species of mice, ground nesting birds and reptiles, and efforts need to be made to destroy them.

54. In view of the widely suggested proposal to relocate the existing village and airstrip sites, the Committee sought the views of interested and involved groups and held informal meetings both at Ayers Rock and in Alice Springs.

55. Motel operators at Ayers Rock indicated that they believed that since relocation of the village will take some time, upgrading of existing facilities would still be necessary. They indicated they preferred to stay where they were, but accepted that if relocation became unavoidable then they should receive adequate compensation and the first option on new sites in the proposed village, in view of their pioneering activities at Ayers Rock. A number indicated their belief that the existing village is sited badly. They also suggested that if located further away, appreciation of Ayers Rock would be greater than is the case at present with the village at its base.

56. In relation to the re-siting of the airport, a representative of an airline indicated the inadequacy of the existing strip, its danger and the adverse effects it is having on the environment. In addition small amounts of rainfall are sufficient to close the strip. All these factors have an adverse effect on tourism.

57. The Committee is aware that alternative sites have been suggested by different groups, both for a relocated village and airstrip. The Committee firmly believes that the village site must not be in or anywhere near the line of sight between Ayers Rock and the Olgas, and that both it and the airstrip should be located outside the present Park boundary.

58. One means of reducing tourist pressure at Ayers Rock that requires consideration is the provision of alternative tourist activity away from the immediate area.

4. ABORIGINAL INTEREST AND INVOLVEMENT

59. The Committee was anxious from the commencement of the inquiry to obtain the views of Aboriginals with a traditional attachment or involvement in the Ayers Rock area about the future of the Ayers Rock-Mount Olga National Park.

60. The Committee noted the comments made in the Interim Report of the Aboriginal Land Rights Commission under Mr Justice Woodward, to the effect that the areas of greatest immediate interest to Aboriginals are also of primary importance for conservation purposes, and that possible conflict between Aboriginal wishes and conservation requirements needs further consideration.

61. During a Committee visit to Ayers Rock and Alice Springs, and in evidence given in Canberra, some reference was made by officers of the Department of Aboriginal Affairs, other officials and interested individuals to the traditional involvement of some elements of the Pitjantjatjara people with Ayers Rock. It was also suggested that a tribal elder named Uluru was regarded as being the traditional Keeper of Ayers Rock.

62. The Committee was advised that, especially in recent years, Aboriginals of the Western Desert language group have expressed concern at the way in which they have been actively discouraged from visiting the Ayers Rock area. It was suggested that people infer wrongly that because very few Aboriginals have lived at Ayers Rock, they no longer have any interest in it. The contention was made that the need by Aboriginals for access to sites at Ayers Rock for ceremonial purposes is as strong today as it has ever been. Expression of this need is difficult due to the scattered nature of the Pitjantjatjara people.

63. In contrast to this view, it was suggested that Aboriginals had not lived in the Ayers Rock area for over forty years, and that in fact the area is not, and presumably never has been, of great tribal, religious or mythological association. The view was also given that the religious importance of a major totemic site in Central Australia, is not determined by any spectacular aspects of the landscape, but by the sacred myths, songs and acts that attach to it by tradition.

64. The Committee resolved that the only way of assessing the importance given to Ayers Rock by Aboriginals was to visit and hold discussions with them. As a result, a Sub-committee visited Mimili, Ernabella and Docker River and talked with elders of the Pitjantjatjara. All tribal elders whom the Committee met, confirmed that Uluru is in fact the traditional Keeper of Ayers Rock, and agreed with the principal views he put forward.

65. A most significant meeting was that held at Mimili where Uluru was present. Uluru gave the Sub-committee the impression that he had a distrust and fear of white people associated with Ayers Rock, resulting largely from the circumstances of his removal from the area and the alleged killing of his brother by whites on the same occasion.

66. The Committee was informed that Ayers Rock was of great importance in traditional life, and was one of five main features which delineate the tribal boundaries, and about which tribal mythology and folk lore centre. Uluru indicated he and a number of other tribal people would like to return to Ayers Rock and settle there permanently. They suggested that this need not be at Ayers Rock itself, but they could live some distance away providing a bore for water be provided.

67. Uluru is apparently anxious to return to Ayers Rock before he dies, in order that the tribal association and mythology can be explained and transmitted to his

son, who is regarded as the heir to his father's position in relation to Ayers Rock. We were advised that if Uluru dies before passing on the secrets of Ayers Rock to his son, then all traditional association between his people and Ayers Rock will end.

68. Uluru indicated that there were certain areas of Ayers Rock that were regarded as sacred and from which he would like to have white people totally excluded. These were chiefly on the west side, with other smaller areas in the north and east. He also told of some of the sacred objects associated with these sites which had been moved or stolen. Some traditional activities could be resumed there immediately, others could only be resumed on the return of the missing sacred objects. A number of the sacred objects are believed to be in Canberra or Darwin.

69. Another point made in the discussions was that for certain open ceremonies with which women and children could be involved, there would be no need to exclude white people. In the case of more significant ceremonies, the entire area was needed and white people should be excluded. This period which is estimated at one to two weeks, occurs at irregular intervals that are governed by seasonal conditions, abundance of game and other factors.

70. Uluru and other tribal elders told the Committee that they would be prepared to show a trusted white man the location of areas that they would want for exclusive use, so that they could be totally prohibited to tourists and visited only under Aboriginal guidance. These areas are believed to be of only limited extent.

71. It was suggested, although only in general terms, that Aboriginals would be prepared to play an active part in Park management, and to interpret Aboriginal mythology, folk lore and paintings to tourists as well as being involved in commercial facets of a new village, if established.

72. It was made clear that restoration of Aboriginal paintings was not necessarily part of their tradition, but that this and new paintings would be done at the inclination of the people.

73. The Committee found that Uluru and other elders designated by him, should be asked to indicate to a trusted white person, areas of Ayers Rock that should be totally banned to tourists, and that should be under the direct control of Aboriginal trustees.

74. Attempts should be made to recover and replace sacred objects to their original position in the caves and other sites.

75. Discussions should be held with Uluru and other tribal elders to make provision for exclusive use of the entire Ayers Rock area when required by Aboriginals for special ceremonies.

76. Aboriginal trustees should be selected to administer the areas under their direct control and be represented on a Board of Management.

77. Aboriginals should, if they wish, be involved in the interpretation of Aboriginal culture to tourists.

78. Provision should exist for Aboriginal commercial activities and involvement in the new village, suggested elsewhere in this Report.

79. Provision should exist for an Aboriginal campsite to be established within the Park and a bore sunk at the site.

80. It should be possible for Aboriginals to hunt within the Park with the aid of traditional weapons, but neither they nor anyone else should be permitted to use firearms within the Park boundaries. The use by Aboriginals of vehicles in the Park should be on the same restricted basis as for other users.

81. The Committee believes that every possible encouragement should exist for Aboriginals to freely express their views about the management of the Park. The circumstances under which Aboriginals have traditionally lived in Central Australia, tends to make them diffident in expressing even the most strongly held opinions.

82. The Committee believes it must be recognised that the Ayers Rock-Mount Olga National Park, by the nature of the functions it is to fulfil, must have a system of management significantly different to most other national parks.

83. Ayers Rock-Mount Olga is a national park with all that that implies, but it is in addition an area of traditional Aboriginal involvement and usage, where in the future the traditional rights of Aboriginals must be assured and where a central role in responsibility for management will rest with them.

5. MANAGEMENT

84. The Ayers Rock-Mount Olga National Park was gazetted in February 1958 and was excised from the Petermann Aboriginal Reserve on its western border. The Park is at present under the control of the Northern Territory Reserves Board on behalf of the Department of the Northern Territory.

85. In 1968 the Northern Territory Reserves Board commissioned a report by an American firm of travel consultants, Harris, Kerr and Forster, who were required to present a comprehensive plan for the development of tourist facilities in the Park, having regard to environmental problems, the role of the Aboriginals in the Park, administration and development, and the siting of various facilities and access systems. The company supported its final recommendations with benefit/cost studies for alternative schemes based on combinations of private and public finance.

86. As a result of recommendations made in the Harris, Kerr and Forster Report, the then Department of the Interior commissioned several further reports on particular aspects of development in the Park. The Environmental Consultancy Group of the Forestry Department, Australian National University, led by Professor J. D. Ovington, undertook to examine the effects of tourism in the area on the physical environment and to make recommendations on methods of arresting deterioration and restoring the natural features.

87. The Department of the Interior also commissioned a report by the firm of Kinnaird, Hill, de Rohan and Young Pty Ltd, on the relative economic costs and benefits of developing the Park.

88. The firm carried out detailed cost studies of four possible programs for development:

- (a) the Harris, Kerr and Forster proposal of a destination resort;
- (b) development to keep pace with natural growth;
- (c) no development at Ayers Rock, but improved access to the Park from Alice Springs, and comprehensive package tours from Alice Springs; and
- (d) deliberate restriction on growth and development deferred wherever possible.

89. The principal problem associated with the existing management is the absence of goals toward which management is directed. The Northern Territory Reserves Board has been unable to obtain the financial support and scientific staff to make the drawing of a plan of management possible. The staff has to date been both small in size and lacked training in park management. Expenditure figures for general improvements and employment over the last five years are as follows:

<i>Year</i>	<i>General improvements \$</i>	<i>Operational \$</i>	<i>Total \$</i>
1967-68	29,186.07	—	29,186.07
1968-69	103,009.89	—	103,009.89
1969-70	20,338.30	—	20,338.30
1970-71	6,101.38	42,634 est.	48,735.38 est.
1971-72	176,501.43	44,874 est.	221,375.43 est.
1972-73	28,190.49	47,624 est.	75,814.49 est.
1973-74	12,000.00 est.	53,230 est.	65,230.00 est.

These figures are low when related to tourist numbers and the significance of the Park.

90. Another principal management problem has been that boundaries have not been established on the basis of ecological criteria. This is a feature of many parks. The Committee was advised that additional areas in the Sedimentaries and the Petermann Ranges were of great significance for fauna and should be included in the boundaries. To date, environmental work of all kinds has been hampered by the fact that no thorough biological survey has been carried out.

91. The main role of management to date has involved servicing the needs of the village; responsibility for vehicles; litter collection; providing garbage facilities and some general supervision of tourists at points of congestion.

92. The location of the village and lack of visitor control are the chief causes of environmental damage.

93. The other major factor in management concerns Aboriginals from the point of view of their traditional usage of the area, associations with sacred sites and objects and a meaningful role in management.

94. The Committee supports the idea of an Aboriginal camp site being made available in an agreed area within easy access of Ayers Rock. The Committee advocates the setting aside of designated areas for exclusive Aboriginal use and for incentives and opportunities for involvement in commercial activities in the proposed new village site.

95. The Committee believes the Park should be under the overall control of the soon to be established National Parks and Wildlife Commission. Administration should be carried out by a more adequately funded and staffed Northern Territory Reserves Board. Important day-to-day decisions would be under the control of a Board of Management. This body should comprise nine people: four Aboriginals nominated from among elders of the Pitjantjatjara who have a traditional association with Ayers Rock, an independent chairman and four others representing the Northern Territory Reserves Board, tourist and other interests.

96. Aboriginals on the Board should in addition be directly responsible for areas of Ayers Rock designated for exclusive Aboriginal usage.

97. The special factor to be borne in mind is that Ayers Rock-Mount Olga National Park, apart from fulfilling the normal functions of a national park, must by virtue of the close involvement of Aborigines in both its administration and by traditional association, be significantly different in its objectives.

98. To give public effect to the multi-purpose nature and administration of Ayers Rock-Mount Olga National Park, the Committee believes that it should be declared a 'National Heritage Area' to signify its importance for both whites and Aborigines and to indicate its protected nature and purpose.

99. Controls on usage and measures for increased visitor appreciation and interest of the area, need to be implemented and should include:

- (a) restrictions on use of private vehicles in the Park;
- (b) provision of interpretative devices at suitable locations, and of comprehensive printed material;
- (c) adequate ranger supervision;
- (d) clear definition of walking paths, particularly in areas of high-density usage;
- (e) barriers to restrain movement of vehicles in sensitive areas;
- (f) prohibition on the use of firewood gathered in the Park;
- (g) closing of the area at night; and
- (h) provide a spacing system for school trips, to even the distribution of numbers.

6. CONCLUSIONS

100. The Committee's major conclusion is that a comprehensive plan of management should be adopted. The plan should aim to minimise environmental damage, while making appropriate provision for visitor usage, and for Aboriginal involvement in the sense of traditional association, employment and management. The Committee recognises that the Park is located in a sensitive arid environment that can easily be changed or destroyed.

101. The Park has become an area of national importance as well as one of great significance to some members of the Pitjantjatjara tribe.

102. A result of this dual importance is that the role of the area is significantly different from that traditionally associated with national parks. The Committee finds that a more appropriate term to convey this role would be that of 'National Heritage Area'.

103. To give effect to its aims the Committee has had a Draft Management Plan prepared by a technical adviser to the Committee, that should serve as a basis for future management.

104. The Committee stresses the importance of early implementation of a management plan and emphasises that considerations such as the outcome of the Aboriginal Land Rights Commission should not prevent the acceptance of the principles it lays down, and which should operate irrespective of what the administering body may be.

105. The Committee finds that overall control of administration should be under the proposed National Parks and Wildlife Commission. Administration should for

the time being, be carried out by a more adequately funded and staffed Northern Territory Reserves Board. A Board of Management with substantial Aboriginal representation should be responsible for important day-to-day management decisions.

106. The increase in visitors to Ayers Rock-Mount Olga National Park is at least in part related to the growing cultural significance of Ayers Rock to all Australians, as well as being part of the 'outback experience'. The Committee found that the area is, and should be, administered as a 'National Heritage Area' with which all Australians can identify, that overseas visitors will be attracted to and in which Aboriginal communities with an historical association with Ayers Rock can continue to carry out traditional rites as well as to participate in management of the Park as a whole.

107. In the past too much emphasis has been on encouraging tourist convenience and access to Ayers Rock. In many ways, if people are restricted from living in hotels or camping immediately adjacent to Ayers Rock, if roads do not necessarily take them precisely where they want to go, then the experience associated with both observing Ayers Rock, visiting neighbouring areas, observing the Aboriginal art and climbing Ayers Rock itself will be enhanced. Removal of the village from the immediate vicinity of Ayers Rock will also greatly improve the appearance of the surrounds and add to, what is for many people, a moving experience.

H. A. JENKINS
Chairman

November 1973

APPENDIX A

LIST OF WITNESSES

BOTT, MR L. F.	Secretary, Department of Tourism and Recreation, Canberra.
DEXTER, MR B. G.	Secretary, Department of Aboriginal Affairs, Canberra.
HARE, MR W. T.	Director, Northern Territory Reserves Board, Alice Springs.
LACEY, MR J.	Planning Officer, Northern Territory Reserves Board, Alice Springs.
LAKE, MR J.	Director of Forestry, Fisheries, Wildlife, National Parks and Environment, Department of the Northern Territory, Darwin.
MACKENZIE, MR P. M.	Acting Assistant Secretary, Policy Branch, Department of Aboriginal Affairs, Canberra.
MCMICHAEL, DR D. F.	Secretary, Department of the Environment and Conservation, Canberra.
OVINGTON, PROFESSOR J. D.	Head of the Department of Forestry, Australian National University, Canberra.
SIMON, MRS F. A.	Officer, Department of Tourism and Recreation, Canberra.
WASHINGTON, MR G. W.	Director of Development and Research, Australian Tourist Commission, Melbourne.

APPENDIX B

AYERS ROCK-MT OLGA NATIONAL PARK

DRAFT MANAGEMENT PLAN

PREPARED FOR THE STANDING COMMITTEE ON ENVIRONMENT
AND CONSERVATION, HOUSE OF REPRESENTATIVES

BY

PROF. J. D. OVINGTON, B.SC., PH.D., D.SC., F.F.S., F.IBIOL, F.R.S.A.

October 11 1973

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INTRODUCTION

The Ayers Rock-Mount Olga National Park has attained national and international recognition within the last quarter of a century and compares favourably with other great national parks of the world. It would be regarded by many people as the focal point of Central Australia.

Located in an arid region where there is a fragile relationship between living organisms and the environment, the Park is very susceptible to change. Some deterioration of environmental quality has followed the relatively recent upsurge of visitor use and the need to improve management so as to minimise further environmental damage is accepted generally.

Traditionally certain Park features, being part of Aboriginal mythology and culture, are very important to Aborigines and their preservation is a matter of Aboriginal and public concern.

The attraction the Park holds for tourists derives from its outstanding natural features, both geological and biological, Aboriginal associations and the desire of urbanites to experience something of 'Outback Australia'. Whilst most visitors appreciate the immensity and grandeur of the scenery as expressed in the rock masses of Ayers Rock and the Olga group on the surrounding flat landscape, they also derive pleasure from the detailed appeal of smaller, intimate features of the Park, e.g. the fascination of Aboriginal cave paintings or the splurge of colour bursting forth as desert plants bloom profusely following rain.

Appropriate provision must be made for considerable and continuing Aboriginal involvement in the area, both in the sense of their traditional association and the potential employment opportunities arising from tourism and the introduction of more comprehensive management. At the same time it has to be recognised the Park has become a major tourist area and many Australians wish to visit the Park.

Environmental protection and continuing use by both Aborigines and tourists can be achieved best by the implementation of a program of integrated management developed according to an agreed, forward-looking plan designed to fulfil specified objectives. The plan should include environmental monitoring to ensure management is effective and the management aims are achieved without unacceptable environmental damage.

MANAGEMENT OBJECTIVES

1. The management objectives of the National Park are defined as:
 - (a) the involvement of an interested local population and particularly Aborigines who have much to contribute because of their traditional association with the area;
 - (b) public enjoyment of the Park through recreation, education and study activities compatible with the wilderness setting of the Park;
 - (c) the survival of indigenous plant and animal species and the care of soil, water and air by the preservation of the variety of ecosystems occurring naturally within the Ayers Rock-Mount Olga area;
 - (d) research to evaluate and develop management practices appropriate to the National Park and of a non-destructive nature to Park values; and
 - (e) multiple use based on the delineation of use zones which in combination ensure a sensible balance between different uses.
2. The Ayers Rock-Mount Olga National Park played, and can continue to play, an important part in Aboriginal mythology and culture. The preservation of its Aboriginal significance is a matter of Aboriginal and public concern.
3. The Park has also acquired considerable attraction for tourists, both national and international, and is important to the Australian tourist industry because of its outstanding natural features, both geological and biological, Aboriginal associations and the image it conjures of 'outback Australia'.
4. Serious, but unnecessary, conflicts of interest have arisen between the different uses made of the National Park but particularly between Aboriginal culture interests and tourism. The rapid upsurge in the number of tourists visiting the area and the expansion of tourist facilities within the National Park, have seriously lessened the use made of the area by Aborigines and resulted in the desecration of features of Aboriginal significance. Furthermore, the capacity of the more popular features to sustain tourism is being so seriously exceeded as to cause environmental degradation and place in jeopardy features attractive to tourists.
5. If the environmental and cultural quality of the National Park is to be sustained, effective management whereby different uses are integrated in a planned manner, is essential.
6. Future management requires:
 - (a) subdivision of the Park into different use and management zones;
 - (b) transfer of the village, tourist domestic facilities and airstrip outside the Park;
 - (c) redesign of the road system within the Park and in particular the relocation of the circular road around Ayers Rock;
 - (d) restoration of devastated areas;
 - (e) construction of an educational-interpretation complex;
 - (f) establishment of research and environment monitoring facilities;
 - (g) more Park staff, the introduction of a staff training program and greater financial support.
7. The introduction of more intensive management provides an unrivalled opportunity for greater and continuing Aboriginal involvement and responsibility.

8. Consideration needs to be given to the inclusion of the Sedimentaries as a wilderness preservation zone within the National Park.

9. The Ayers Rock-Mount Olga National Park is seen as being an extension of, and closely linked with, the concept of a Central Australian Aboriginal Reserve, being distinguished mainly by the need to provide for greater tourist use.

ABORIGINAL SIGNIFICANCE

The significance of Ayers Rock and the Olgas to Aborigines has been documented by several authorities. The whole area in general, and Ayers Rock and the Olgas in particular, apparently played a supremely important ritualistic role in the lives of Aborigines, notably the Pitjantjatjara people. Many physical and biological features had symbolic significance to the Aborigines and most caves are decorated with their colourful paintings. Aboriginal activities were closely adapted to the harsh desert environment and seasonal variability by an elaborate social structure in which all aspects of life were controlled by taboos and an accepted pattern of behaviour. Apparently there was some concentration of Aborigines around Ayers Rock and the Olgas, for apart from their cultural significance the monoliths were probably important as a source of water and game was probably more abundant in their vicinity. Unfortunately, this intimate association lessened about half a century ago after which few Aborigines have lived in the area and then mainly as itinerants. Because of the separation of the Park from the Petermann Aboriginal Reserve the association is difficult to renew. The extent to which some features have been desecrated irretrievably by non-Aboriginal use is unclear but the Park has not completely lost its value to Aborigines.

Small groups of Aborigines still visit the area travelling in private vehicles from the surrounding region; they do not mix greatly with non-Aboriginal visitors but stand apart. Occasionally large numbers of Aborigines congregate in the Park and carry out ceremonial practices from which non-Aborigines are normally excluded. Consequently it seems much of Aboriginal importance has been retained.

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HISTORY

The *Northern Territory Reserves Handbook* (1967) provides a comprehensive account of the discovery and exploration of the Ayers Rock region. Mt Olga was first sighted by E. Giles in 1872 and in 1873 W. C. Gosse visited both Mt Olga and Ayers Rock which he named after Sir Henry Ayers, a Premier of South Australia. The Horn expedition of sixteen people visited the area in 1894 following which there was a long period of inactivity before W. McKinnon visited the area in 1931 and climbed Ayers Rock.

Between 1931 and 1946 only 21 non-Aboriginal people are recorded as having climbed Ayers Rock. Camels were the common means of transport to Ayers Rock

before 1948 when the first graded track from Curtin Springs was constructed. Soon Len Tuit and a few other residents of the surrounding area were conducting visitors to Ayers Rock and the Olgas but entry permits had to be obtained from the Welfare Branch.

Kurt Johannsen crash-landed his aircraft near Ayers Rock in 1936 and spent several days there whilst the aeroplane was repaired. On 20 April 1958 the first official landing of an aircraft near Ayers Rock took place. The number of landings increased and eventually an airstrip was constructed.

In 1958 the Ayers Rock-Mt Olga National Park was excised from the neighbouring Aboriginal Reserve and dedicated to the Northern Territory Reserves Board. With the removal of the entry restrictions the number of visitors increased rapidly from 2,296 in 1958 to 18,963 in 1967. There has been an accompanying growth of tourist innovations, particularly with respect to living accommodation, roads and trackways within the Park. Much of this has been on a relatively ad hoc basis with the Northern Territory Reserves Board doing everything possible within its limited means to rationalise development against mounting pressure for increased use.

The problem of environmental damage and need for planned management following the upsurge of tourism was quickly appreciated and various studies were commissioned (Harris *et al.* 1969; de Rohan and Young 1972; Ovington *et al.* 1972). In 1973 the House of Representatives Standing Committee on Environment and Conservation held formal meetings in Canberra and Alice Springs to evaluate the situation and formulate firm proposals for future use and environmental protection.

The Australian Government is greatly concerned with Aboriginal well-being (McMahon 1972) and the Prime Minister of Australia, the Hon E. G. Whitlam has emphasised his concern to safeguard Aboriginal interests at the Ayers Rock-Mt Olga National Park, possibly by including it as part of a Central Australian Aboriginal Reserve.

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REGIONAL RELATIONSHIPS

The Northern Territory Reserves Board controls 36 reserves totalling 604,907 acres (244,786 ha) and of these the Ayers Rock-Mt Olga National Park is by far the largest (311,680 acres—126,179 ha). By virtue of its size, variety and location, the National Park provides a vital link within the series of protected conservation areas in the Northern Territory and an important component of the National Series of Australian National Parks.

Whilst the Ayers Rock-Mt Olga National Park is but one of many tourist attractions in Central Australia it has acquired special significance. The Park is widely publicised nationally and internationally and most tourists visiting the Northern Territory hope to visit the Park. Whilst the cost of running the Park is considerable, exceeding the return from fees levied on tourists, the Ayers Rock-Mt Olga National Park must bring benefit to the Northern Territory and Alice Springs by attracting tourists and advancing the development of tourism and tourist-associated activities there.

The importance of the Ayers Rock-Mt Olga National Park cannot be assessed solely in terms of conservation or economic gain through tourism. To many Australians it has become symbolic of Australian nationalism and a source of pride in the uniqueness of their country. Many Australians who visit the Park do so because they believe they gain a better insight into the life of outback Australia and feel they somehow become more Australian by visiting the Park and if possible by climbing Ayers Rock.

Some prescriptions for management of the Park are having important impacts on the surrounding area. For example tourists are not allowed to collect firewood in the National Park but are required to bring their own firewood into the Park for heating and cooking. Consequently the roadsides near the Park are being seriously depleted of firewood as coach loads of tourists search for firewood. Similarly the use of the Desert Oak, *Casuarina decaisneana* for signposts, traffic barriers and fences within the Park is leading to the clearing of this attractive and ecologically important species from surrounding areas.

DESCRIPTION OF NATIONAL PARK

Location and area

The National Park is in the Northern Territory of Australia at latitude 25°S and longitude 131°E and is located in the arid interior of the Continent. The Park is approximately 200 air miles (322 km) south-west of Alice Springs, the largest settlement and tourist centre of Central Australia, and is roughly equidistant (1000 miles or 1610 km) from the major coastal cities of Australia.

The Park is 487 square miles (1260 km²) in area and extends 45 miles (72 km) from east to west, and eight miles (13 km) from north to south. To the west and south is the Petermann Aboriginal Reserve, to the east are cattle stations each of about 1200 square miles (1930 km²), and the salt plain of Lake Amadeus borders the north of the Park.

Access

There is no continuous fence around the National Park so that it is difficult to control access but because of the isolation of the Park this does not represent a serious problem.

Access by road is mainly via a branch road from the Stuart Highway, the branch road traversing Erldunda, Mt Ebenezer, Angas Downs and Curtin Springs cattle stations for a distance of about 100 miles (160 km). The road is unsealed, hard on vehicles and service repair facilities are not well-developed. During wet periods the road may be impassable because of local flooding. Because of the hazards of road travel many visitors are delayed and it is difficult to keep to fixed time schedules. The main entry road passes the Curator's house where entry fees are paid, so that some control of entry and general contact with tourists as a whole is possible.

Alternative access is provided by air transport, there being scheduled commercial flights from Alice Springs to the airstrip situated in the National Park and close to

both Ayers Rock and the village. Periodically the airstrip is closed because of air currents generated from Ayers Rock or flooding as water discharges from Ayers Rock following rain.

The majority of visitors arrive by road. In 1970-71 17% of all visitors arrived by aircraft, 29% by private motor vehicles and 54% by coach. Some seasonal variation in the relative modes of access occurs.

Climate

Continuous, systematic climatic data have been collected at Ayers Rock only since 1967, nevertheless the main climatic features can be deduced from consideration of these data and longer-term records taken elsewhere in the region.

Perhaps the most significant feature of the climate is the aridity, the average annual precipitation probably being about 6 in (150 mm). Annual rainfall is rather variable with sequences of dry years having an average annual rainfall of about 3 in (75 mm) followed by relatively wet years with rainfalls of over 11 in (280 mm). The records indicate a peaking of rainfall in December whilst August is generally the driest month. Most of the rain tends to fall as heavy downpours often associated with thunderstorms and can cause serious soil erosion and considerable disruption of transport.

Probably because of the low humidity and absence of continuous cloud cover, there is a marked diurnal fluctuation of temperature with hot days being followed by cold nights. Typically the days are often clear, the mean daily hours of sunshine per month ranging from about 7 to 10 for June to January respectively. During the relatively cool March-October winter period night frosts are commonly experienced. February is the hottest time of the year and then daytime temperatures often rise above 100°F (37°C). The annual potential evaporation of over 100 in (250 cm) greatly exceeds annual precipitation so that there is a large water deficit.

The prevailing wind is from the south-east. On occasion the wind becomes so strong as to make landing of aircraft at the Ayers Rock airstrip and climbing of Ayers Rock hazardous.

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Physiography

The two dominant physiographical features of the National Park, namely Ayers Rock and the Mt Olga Group (the Olgas) are the prime tourist attractions. Because of their size they constitute important water catchments and water draining from them creates the conditions necessary for the development of the relatively more luxuriant, mesic vegetation at their bases.

Ayers Rock and the Olgas are two inselbergs, their summits being over 1000 ft (300 m) above the surrounding plain. Ayers Rock is some 5½ miles (9 km) around its base and covers about 1200 acres (486 ha). The summit of Ayers Rock is 1143 ft (348 m) above ground level and 2870 ft (875 m) above sea level. There are many caves of varying sizes; some are accessible from the ground and others appear mysterious by virtue of their remoteness and inaccessibility. Much of the mythology surrounding Ayers Rock, named Uluru by Aborigines, concerns these caves and their place in Aboriginal rituals and legends.

Mt Olga, or Ngunarra, is the highest peak of the many domes comprising the Olgas, and is 1790 ft (546 m) above the ground, or 3507 ft (1069 m) above sea level. The Olga group covers about 13.5 sq. miles (35 km²) with a circumference of about 14 miles (22.4 km).

The Olgas have about six major domes and thirty smaller domes whilst Ayers Rock is a single dome with a small subsidiary outcrop 'Little Ayers Rock' to the north-east. The sides of both rock formations are steep, those of Ayers Rock rising abruptly from the surrounding plains, sometimes at angles greater than 80°, whereas around the Olgas there is a greater development of foothills so that the lower slopes are less steep.

The remainder of the Park is relatively flat, being dominated by parallel, reticulate and irregular sand dunes with stable flanks, minor areas of mobile sands and flat sand plains.

Geology

The Ayers Rock-Mt Olga National Park is largely covered by a deep layer of Quaternary sand and alluvium. The underlying rock is exposed as Ayers Rock and the Olgas inside the Park, and Mt Currie and the Sedimentaries at the northern and north-western borders of the Park. At sunrise and sunset Ayers Rock and the Olgas undergo a remarkable sequence of colour changes from dull browns to vivid purples and reds with the changing angle of the incident light on the rock surface.

Both Ayers Rock and Mt Olga are classified as Mount Currie Conglomerate (probably formed during the Cambrian Period 500-600 million years ago) but differ in important respects. Ayers Rock is an arkose (feldspar-rich) coarse-grained sandstone which is grey-red when weathered whereas Mt Olga is composed of a pebble, cobble and boulder conglomerate cemented together by fine-grained epidote. The smooth outline of Ayers Rock arises in part from the weathering process of spalling in which rock flakes peel off the rock to leave a smooth surface. The Kangaroo Tail (Ngaltawadi—Digging Stick) is often supposed to be a large spall which has slipped off the Rock face, but in reality is attached to Ayers Rock and exposed by weathering underneath and around.

Strata in both Ayers Rock and Mt Olga strike mostly north to north-west, but the dip at Ayers Rock is about 80° compared with very shallow dips in the Mt Olga group. In the Sedimentaries to the north-east, the Cambrian Mount Currie Conglomerates and the underlying Upper Proterozoic Winnal and Indindia Beds are exposed as a series of low parallel ranges running generally in a south-east/north-west direction.

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Soil

The soils of the Park are classified as red earthy sands in the map accompanying *A Handbook of Australian Soils* (Stace *et al.*, 1968). The Atlas of Australian Soils shows the soils in the vicinity of Ayers Rock and Mt Olga as shallow coherent sands

with minimal development. A large surrounding area is described as having red sands with an earthy fabric and weak pedologic development. An area to the north-east of Mt Olga has red earth soils with a neutral reaction. Many of the soils have compact or cemented horizons underlying an upper layer of loose sand and overlying a stone layer at variable depths. Where soil erosion has been active the upper loose soil may have been removed to expose the compacted horizons.

In summary, except for the shallow soils associated with Ayers Rock and the Olgas, the soils are mapped as generally deep (a metre or more) of sandy or sandy loam texture and very well drained. The soils would be regarded as being of poor to moderate fertility, with small amounts of nitrogen and phosphorus.

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Hydrology

Water is vital to the ecology, and in the use, of the National Park. Availability of water largely determines the distribution pattern of plants and animals and shortage of water is seen as setting a limit to the number of people the area can support. Consequently, detailed surveys have been made to quantify the water resource and to explore the possibility of piping water to the Park. As yet there appears little likelihood of significantly increasing the water supply within the near future.

The Ayers Rock and Mt Olga Monoliths serve as huge water catchments and dominate the hydrology of the area. During wet periods large quantities of water are discharged off the rock surface along fairly well defined pathways in rock fissures to spread out into the surrounding countryside from which they are evaporated or percolate downwards to recharge the underground water over the underlying geological syncline. Despite the high rate of insolation small pools of water persist for much of the year in depressions on the rock surface of Ayers Rock and the Olgas and support an interesting aquatic fauna. Water may accumulate at the base of Ayers Rock after heavy rainfall and Maggie Springs at the base of Ayers Rock is a more or less permanent water supply fed by water draining off the Rock. Several small creeks flow from the Olgas passing across the basal scree to the surrounding sandy areas where they are rapidly dissipated.

In general, surface water movement is local because of the aridity and the permeability of the soil. Water flowing from the rock masses tends first to follow fairly narrow channels and then to fan out across the sandy plain as sheet flow. Run-off also occurs from the sand dunes onto the intermediate flat areas.

This natural redistribution of water leading to the creation of localised wetter areas is reflected in the vegetation pattern, mulga, *Acacia aneura*, and bloodwood trees, *Eucalyptus terminalis*, being found on the moister sites. There is evidence to indicate that the poor health of some plant communities dominated by more mesic species has resulted from drying out due to the blockage of natural drainage by roads and the airstrip.

Flora and fauna

Because of the isolation of the Park and a shortage of scientists, information about the flora and fauna is scanty and there is an urgent need for comprehensive biological records. The Arid Zone Research Institute at Alice Springs groups the vegetation of the Park into three main community types, namely:

1. Upland communities of the rock monoliths and the foothills dominated by spinifex, *Triodia irritans*.
2. Mulga shrub, *Acacia aneura* and grassland communities on areas affected by water run-off, mainly from Ayers Rock and the Mt Olga group.
3. Sand plain and dune field communities with hard spinifex, *Triodia basedowii* and soft spinifex, *Triodia pungens*.

About three hundred plant species have been recorded in the National Park; most are found elsewhere in the arid central Australian region, rare species occur particularly at the wetter waterholes and soaks. The deliberate introduction of exotic plant species to assist in the revegetation and restoration of degraded areas, whilst well intentioned, is a matter of concern because of the danger it may pose to the indigenous flora.

The vegetation around the base of Ayers Rock or the Olgas tends to be more luxuriant and diverse than that typically found over the Simpson Land System because the rainwater flowing off the large, impervious catchments of Ayers Rock and the Olgas gives less harsh conditions for plant growth. The spectacular profusion of flowering shrubs and forbs following rain can be an important tourist attraction. The vegetation is liable to be damaged readily by trampling, wildfire or interference with water drainage.

The *Northern Territory Reserves Board Handbook* (1967) contains a list of mammalian species which includes seventeen species of marsupials, eight of rodents, ten of bats as well as dingoes, feral cats, feral camels and foxes. Some eighty-six species of birds are listed and seventy species of reptiles.

Whilst the fauna is of general interest, many animals are nocturnal or shy and consequently are rarely seen by tourists who tend to confine their activities to the roads and certain localities. The native fauna could be seriously affected by deliberate or unconscious destruction of vegetation or habitat, by uncontrolled wildfire, by tourist disturbance of animals and by the introduction of exotic species. Introduced animals include cats, rabbits, camels, cattle, horses, donkeys, dogs and foxes; in particular cats and rabbits can become very destructive pests and already the staff of the National Park has had to adopt control measures.

References

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Land systems

Perry *et al.* (1962) recognised two main land systems in the National Park, namely the Gillen System covering Ayers Rock and Mt Olga, and the surrounding Simpson system characterised by low sandhills with intervening flat sand plain areas.

The Arid Zone Research Institute in a detailed report to be published soon, with accompanying map, based on aerial and ground surveying, subdivides these two broad systems into fourteen land unit classes mainly according to differences in soil,

vegetation, erosion and fauna. Because of the relative uniformity of topography, soil and vegetation in the land units, they provide a good basis for delineating management units and rationalising management practices.

References

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TOURISM IN THE NATIONAL PARK

General

Improvements in transportation have enabled tourists to travel widely even to the remotest parts of the earth, and the rapid growth of tourism resulting from increasing affluence and vacation time is a world phenomenon. Since the Ayers Rock-Mt Olga National Park is a widely recognised tourist mecca, tourism is likely to grow there, and any attempt to curtail this growth could cause adverse public reaction.

In the holiday year 1960-61, 4332 persons were admitted to the Park, by 1964-65 the number had increased to 10,427 and by 1970-71 to 30,201. Making various assumptions, Harris, Kerr and Forster (1969) predicted that by 1980 the annual number of visitors would be around 150,000.

Nature of tourists to the park

Currently non-Australian visitors to the Park constitute about 10% of the total tourist numbers and whilst coming long distances and from many countries they are not necessarily of high income groups. Tourists of the Park are predominantly young Australians under the age of 45 years and encompass a wide social range. The National Park has an important educational role and is much visited by school and college groups travelling in hire coaches. Families travelling by private car and mature and elderly people in tours organised by private coach companies constitute other significant tourist categories.

Virtually all tourists must be strongly motivated to visit the Park since its remoteness means relatively high travel costs and the harshness of the climate can entail some discomfort.

Variability of tourist use

The management of any national park must be geared to cope with the peak number of visitors. Serious management problems are posed by the marked discontinuity of visitor use at the Ayers Rock-Mt Olga National Park.

From year to year there is a general trend to increasing numbers of tourists but annual numbers can be greatly affected by extraneous factors such as the vagaries of the weather, the effects of industrial strikes on transport, and the state of the national economy.

Within a year there is a pronounced pattern of changing visitor numbers caused by seasonal differences in climate, the timing of school vacations and the timing of the vacation period in the northern hemisphere.

Large diurnal fluctuations in number of visitors occur depending on the scheduling of coach tours, public holidays and the reliability of coaches driven long distances over poor roads.

Within the Park, visitor use is concentrated on any day to certain localities, the distribution pattern changing during the day. Thus tourists are only present on Sunset Strip Dune for about half an hour around sunset when the spectacular colour change of Ayers Rock can be viewed. They tend to climb Ayers Rock in the early morning before the heat of the day when the Climb is relatively deserted. Much of the Park remains unseen, or only seen by tourists through a dust haze as they pass along the roads.

Tourist activities

After a long, somewhat tiring journey most tourists rarely spend more than two nights at the Park. Their movements in the Park are largely determined by the coach drivers (captains) who decide where the coach will go and how long will be spent in a particular locality. Generally the period in the Park is one of great activity and tourists do many different things.

The most important activities are pleasure driving, bush walking, particularly in the Olgas and around Ayers Rock, physical exertion, for example, by climbing or attempting to climb Ayers Rock, photography, nature appreciation, viewing the scenery and the colour changes of the rock monoliths, mental relaxation, buying a gift from the limited shopping facility, soaking up the sun, camping, barbecuing, gaining a better understanding of Aboriginal culture and of Aboriginal life by inspecting Aboriginal cave paintings and participating in guided tours organised by coach companies or the Park staff and finally gaining some appreciation of the immensity of Central Australia.

In general, tourists enjoy meeting and talking with fellow travellers who are but temporary acquaintances. Social drinking and playing pool in one of the several bars and evening campfire talks and sing-songs for the younger set are also important and are associated with a holiday camp atmosphere in relatively unsophisticated surroundings.

Tourists generally seem to come to like the feeling of isolation from world affairs. They are commonly disappointed at not being able to see a variety of wildlife at close quarters and most would appreciate some contact with Aborigines especially if this provided a better understanding of Aboriginal culture and how Aborigines were able to survive in such harsh surroundings. Most accept the standard of accommodation provided and realise the difficulties faced in catering for visitors.

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PAST MANAGEMENT

Management by the Northern Territory Reserves Board was handicapped by inadequate finance, the unexpected rapid growth of tourism, pressures exerted by groups having limited, and often short-term, interests in the Park, inadequate scientific knowledge of the Park area and inability to monitor change. Inevitably in such circumstances much of the management was ad hoc and orientated towards catering for the more pressing need, essentially tourism. Tourist facilities were provided by both private and government finance.

Typical of the tourist facilities now present within the Park boundaries are a highly dispersed village lacking in cohesion and poorly integrated into the landscape,

a hotel, motels, camping grounds, a shop, petrol station, an airstrip, a network of roads and walking trails, carparks, a piped water supply with pumps and storage tanks, waste bins at strategic points, waste disposal pits, signposts, a bush shelter and a hand chain to assist people climbing Ayers Rock with a cairn at the summit. The resident Park staff has responsibilities for conducting guided tours, for ensuring such domestic services as water supply and waste disposal are maintained and for assisting people in difficulties, e.g. on the Ayers Rock climb.

With varying degrees of success past management has attempted: (1) to control tourist movement by building or improving roads and by closing roads subject to erosion or causing vegetation decline; (2) to restore degraded ecosystems by soil levelling and revegetation with exotics; (3) to limit expansion of accommodation facilities; (4) to control introduced animals by prohibiting their entry into the Park and reducing their numbers when they reach pest proportions; (5) to restrict wild-fires; (6) to preserve fauna and flora by measures such as prohibition of shooting by non-Aborigines, the picking of plants and the restriction of vehicles to specified roads and (7) to protect cultural features and sites of scientific interest by organising regular checks by the Park staff.

Despite the efforts of the Northern Territory Reserves Board depreciation of Park values has occurred and the immense educational potential of the National Park has been little realised.

FUTURE MANAGEMENT

Management considerations

The use made of the Ayers Rock-Mt Olga National Park area by the Aborigines was closely attuned to the capacity of the area to meet their level of use in perpetuity. With the establishment of the area as a national park it had to fulfil several different objectives some of which are not complementary and unfortunately the more intensive use has been gained at the expense of some park features so that the environmental quality has been degraded progressively. In effect the carrying capacity of the Park has been exceeded.

The problem of balancing the use of a national resource against the capacity of the resource to sustain that use is more difficult in the case of national parks because of the multiplicity and complexity of uses and commonly, lack of knowledge of the ecology of natural ecosystems. Ovington *et al.* (1972) has suggested that greater use of the Ayers Rock-Mt Olga National Park could be achieved without increasing environmental damage by better planning of management and the introduction of suitable management practices.

Like other great national parks, the Ayers Rock-Mt Olga National Park possesses a combination of natural and cultural features which are highly attractive to tourists. Despite its large size a point has now been reached where the value of the National Park is being lessened by tourism.

Tourism may be regarded as a blessing or threat according to individual priorities. Understandably, tourist organisations are interested in capitalising on national parks and the desire of tourists to enjoy themselves in a natural setting so as to realise the full potential of national parks as a revenue-earning resource. However, if left unchecked, tourism may expand so greatly as to jeopardise the resource on which tourism depends and create conflict with conservationists. This overcrowding is taking place over a very limited but immensely important part of the Park.

The prediction of the growth in tourist numbers and the plans canvassed to promote tourism are causing concern to those interested in maintaining the scenic,

scientific and cultural values of the Ayers Rock-Mt Olga National Park. The conflict of interests can only be resolved by controlling development through the definition of policies integrating different uses in a rational manner and adopting an effective management strategy based on appropriate management techniques.

Two features of the Ayers Rock-Mt Olga National Park are of particular significance. These are: (1) its cultural importance to Aborigines and their need to re-establish a meaningful and continuing involvement with the area; and (2) the fragility of the biological as compared with the geological features.

In order to fulfil the objects of management the future use of the Park requires a compromise between preservation and development interests and five major management problems have to be faced. These are: (1) clearly identifying the wishes of Aborigines on the future of the Park and introducing a form of management acceptable and advantageous to them; (2) the division of the National Park into management categories fulfilling different uses; (3) restoration of damaged areas or features; (4) the transport of tourists; and (5) tourist accommodation.

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Management prescriptions and justification

Major new development proposal

Much of the pressure on the resources of the National Park could be lessened by developing the educational role and this has added significance because of the preponderance of young tourists. Many people are disappointed that they are poorly catered for in this respect. Some development to rectify this situation, if approved by Aborigines and handled sensitively, could be very effective in providing Aborigines with a means to educate others about the natural history of the Park but more importantly of a way of life that has evolved over centuries. Consequently the main new proposal for the first operative period of the management plan is orientated towards developing the educational potential of the Park.

The location of such a development is critical for it should not detract from the natural attributes of the Park and should be readily accessible. Ideally it would be best situated at the entrance to the National Park but within its boundaries. If the entrance to the Park is to be changed with road and village realignment the needs of the educational complex must also be considered. The architecture of all buildings should be in harmony with the landscape.

The educational complex should contain the following:

1. A natural history area whereby to display local flora and fauna in a natural setting. Whilst the emphasis would be on naturalness, some irrigation may be required to exhibit plants. The display of animals should not be based on small cages but walk-in animal enclosures and aviaries and possibly a nocturnal house for animal display.
2. A museum with forceful dioramas requiring viewer participation and illustrating the geological evolution of the area, Aboriginal life and ecological aspects of the Park.
3. An Aboriginal Skills Display Area where Aborigines could demonstrate traditional skills and invite others to participate, e.g. in painting, carving, tracking, the preparation of traditional tools and weapons and boomerang

throwing. Provided it is acceptable to Aborigines a related area could be set aside where they could play traditional musical instruments and dance.

4. A shopping centre for the purchase of Aboriginal arts and crafts, colour transparencies and books about Central Australia and the Park.
5. An information centre with a model of the area and well-prepared leaflets, audio-visual information devices, a lecture theatre, central offices for the Park staff and a fire-proof storage room for filing records, particularly of management practices, plans, photographs, etc.
6. A workshop for the maintenance of equipment.
7. An in-service training centre for the Park staff.
8. A health centre in case of accidents.
9. A departure area for conducted tours.

Zoning and enlargement of National Park

Because some uses of the National Park are not complementary, it is necessary for management planning purposes to identify management zones each having a common use, or combination of uses. At the Ayers Rock-Mt Olga National Park *four main zones can be identified: intensive, wilderness, total protection/reference and domestic use zones.* The detailed allocation of these zones will be defined by ground survey, but their general distribution can be identified.

The Intensive Use Zone will be developed to varying degrees mainly in order to provide for outdoor recreation and education appropriate to natural surrounds. Three main areas are included in this category, the proposed education complex at the entranceway, the general area of Ayers Rock and scenic viewing areas such as Sunset and Sunstrip Dunes.

The wilderness zone will be used to preserve the natural environment so that man-made structures will be banned. However, the entry of people on foot, e.g. bush-walkers, will be permitted although they will be restricted in their activities, e.g. no camping, picking of plants, hunting and removal of rocks. This category would include part of the Olgas and generally the area bordering the main roads.

There will be no general tourist access to the Total Protection/Reference Zone and entry will be by permit only and for clearly defined purposes stipulated on the entry permit. The Zone will be used to protect features of great anthropological or scientific interest, to provide type reference areas against which to measure long-term change and to provide undisturbed reserve areas to maintain plant and animal species in essentially natural conditions. The more remote areas of the Park will be in this category as well as designated parts of the Olgas and possibly small areas around Ayers Rock if this seems vital for Aboriginal or scientific purposes. Sacred and other areas of high value to the Aborigines would be located in this zone and access will be given only on terms and conditions acceptable to the Aboriginal representatives on the proposed Council (see under 'Responsibilities for management policies and implementation'). Because of the juxtaposition of the Sedimentaries to the National Park and their variety of ecology consideration needs to be given to including them in the National Park as part of the Total Protection/Reference Zone if detailed ground survey confirms their cultural and scientific value.

The Domestic Zone includes the roads, houses at the entranceway, accommodation for staff at strategic positions in the Park and associated facilities such as water supply tanks.

Resiting of village

The greatest threat to the National Park has arisen from the building of tourist accommodation within the Park boundaries and has been enhanced by the close proximity of this accommodation to Ayers Rock which makes the protection of cultural and biological features of Ayers Rock difficult, if not impossible, and detracts from the scenic grandeur, primitiveness and uniqueness of the Rock.

In order to avoid the conflicts of interests that inevitably arise between park and village management, the village will be resited outside the National Park and preferably at a distance of several miles from the Park boundary. All existing concession holders in the National Park should be recompensed reasonably and if they so desire be given priority in the allocation of land at the new village site.

With the removal of tourist living accommodation from the Park, the Park should be closed at night and only open to tourists during the day.

Buildings and Park furniture

All buildings, display facilities (signposts, noticeboards, interpretative signs) and Park furniture (seats, waste bins, etc.) will be of a high standard and be designed, located and made of such material as to be in sympathy with the Park landscape whilst ensuring functional efficiency. They should not be constructed from materials obtained within the Park or in the area bordering the Park.

Reorganisation of tourist travel within the Park

Since the closeness of the airstrip to Ayers Rock is undesirable for aesthetic, environmental and air safety reasons, it will be relocated outside the National Park. The actual site of the airstrip should be determined by the new location of the village, air safety aspects and site requirements. The frequency of daily flights around Park features is a matter of concern and some restrictions on this may have to be applied.

The present system of roads and walking tracks can only be described as an environmental mistake. The road system as a whole must be replanned and resited in the interests of minimising environmental damage rather than maximising tourist convenience. Special attention needs to be directed to reducing the effects of roads on water drainage patterns, in reducing dust problems, in fitting the roads into the landscape and on road safety.

The main problem is the circular road around Ayers Rock. For this, two alternative approaches are possible: (1) leaving the main circular road in essentially its present position whilst building water-flow channels under the road to prevent ponding of water; and (2) resiting the road sufficiently far from Ayers Rock to minimise interference with drainage.

Of these alternatives, alternative (2), i.e., locating the road well clear of the base of the Rock should be implemented for various reasons. Such a road location facilitates wardening since the general flow of tourists is not in the immediate vicinity of the Rock, a greater feeling of remoteness from civilisation will be engendered for people viewing specific features, dust hazards to cave paintings will be reduced, noise pollution lessened and very importantly the environment be placed at less risk particularly with respect to hydrological effects.

Travel from the circular road to the Rock will be based on a limited number of radial spur roads from the outer road, running between water flow zones and not penetrating closer than 250 yards (227 m) of the Rock perimeter. A car park, bush shelter and information boards will be provided at the end of each spur road and walking trails of various grades will lead out from the end of each spur road to points of interest. This spur road concept provides further advantages in that tourist

entry will be at specified points, certain features can be 'rested' more readily by a rotational use system; if consultation with Aborigines reveals that for cultural reasons specific features should be preserved only for Aborigines, these features can be isolated more readily and it is possible to develop different types of use associated with the different spur roads.

Since road resiting must be accomplished in stages during which the Park will continue to be used, a detailed program of road construction will be prepared in consultation with road engineers bearing in mind the purpose of specific stretches of road, anticipated degree of usage, aesthetic and conservation considerations, the implication of road location in influencing future Park use and maintenance costs. Major roads should be sealed and be of 30/40 mph (50/65 kmph) alignment standards and minor roads 20 mph (32 kmph). Adequate provision will be made for water discharge off the road. Some roads will be restricted to Park staff and provision will be made for closing these roads to the general public.

Environmental damage is being caused by walkers, particularly around the accommodation centres and near sites of special interest. With the transfer of the village outside the Park, the main use by walkers will be largely around special features. In these situations, a major problem is the excessive size of some conducted groups and it is desirable that numbers should be reduced to about twenty per group.

All trails will be sign-posted with the distance, sites of interest and time taken to complete the trail given. The trails have to cater for people of very different fitness levels and should be formed where necessary, clearly marked, fenced where they pass areas which cannot absorb intensive use, if necessary provided with seats and carefully located for attractiveness and to lessen interference with drainage.

Horse trails and motor bicycle trails will not be allowed because they are incompatible with other users.

Problems arise where several coaches arrive at the same site more or less simultaneously. A number of alternative coach tours based on an interlocking time schedule should be prepared. Upon entering the Park coach drivers would be allocated a specific tour and be required to keep to it.

In the long term it may prove desirable to completely review the means whereby tourists travel within the Park, e.g. only coaches belonging to the Park might be allowed in, each operating on a fixed schedule from the entrance gate and having an official guide. With technological development other transport systems may prove more acceptable, e.g. an electric monorail service.

Restoration of damaged areas and Aboriginal paintings

Much of the area has been little modified and environmental damage tends to be very localised being most serious near the more popular caves, around Ayers Rock, in the vicinity of roads and on that portion of Sunset Strip Dune which is used for viewing the colour change of Ayers Rock at sunset. Some restoration measures have already been used.

Restoration of the area around Ayers Rock and in the vicinity of existing or former abandoned roads will involve local site levelling in order to restore the natural slopes. Revegetation wherever possible will be by natural regeneration, but in special cases consideration may be given to the use of artificial seeding or planting of seedlings. In general only plant species found naturally in the Park will be used. Introduced plant species will only be used where native species cannot be established readily and if the ecology of the introduced species is well known and there is evidence to indicate the alien plants are unlikely to persist, can be readily controlled and will not cause adverse environmental and scenic effects.

The problem of site restoration at Sunset Strip Dune is more serious and here it will be necessary to construct special viewing platforms to prevent further lowering of the dune and destruction of plants on and adjacent to the dune.

The preservation of Aboriginal paintings is of prime concern and the problem arises from the effects of time, lack of strict tourist control and dust. Aboriginal artists will need to be employed to continuously renovate the paintings using traditional materials and methods. The projected increase in the number of Park staff should improve supervision and lessen deliberate vandalism. The dust menace will be reduced by the establishment of vegetation around the caves and possibly by the laying of matching plastic webbing on the floor of the caves to reduce dust caused by tourists walking in the caves.

As soon as possible all cave and other paintings should be photographed and documented.

Interpretation facilities

Serious deficiencies exist in the interpretation service provided for tourists. Many visitors leave without learning much of the environment, wildlife and Aboriginal history or mythology, in some cases they leave with highly erroneous impressions because of the imaginative and highly coloured information provided by some unofficial guides.

In order to rectify this unsatisfactory situation, well-presented and illustrated brochures, maps, leaflets and other descriptive information will be prepared and made readily available. More trained and knowledgeable guides, preferably Aborigines, will be available to conduct tours. More signposts and information plaques are required to describe cultural and historic features as well as to help in the naming of plants and understanding of geological, ecological and landscape features. Recorded information tapes might be provided in selected localities to supplement guided tours.

The design and location of these interpretation facilities are important and the charge for published and taped information should largely cover the costs of production.

Fire

Uncontrolled wild fires can be very destructive. A fire control plan will be prepared and any necessary equipment provided for fire detection and suppression. Staff training courses on fire fighting will be provided and fire fighting exercises held at intervals.

Controlled burning is a potential management tool but should not be practised until more is known of the ecological effects of fire in the National Park, and of the consequences of a fire ban policy.

Mining, hunting and harvesting of resources

No prospecting and mining will be permitted within the National Park because of the danger they pose to the quality of the Park and their incompatibility with other Park uses. The harvesting of flora and fauna for commercial gain will be prohibited.

Some control measures may be needed for plant and animal populations e.g. in controlling deliberate plant introductions and weed species. Similarly, whilst hunting will be banned some control of animal populations may be needed when exotic or native animal species become so numerous as to induce environmental degradation. Great care is needed in the selection of control measures used to ensure that there is little likelihood of unforeseen adverse consequences, as for example with the use of non-specific persistent poisons or weedicides.

Research

Management of the Park is made more difficult and speculative because of lack of knowledge of Aborigines, tourism and the natural history of the Park. The prime need of research is to develop management techniques appropriate to the Park and to critically evaluate past and future management procedures by monitoring change.

Every effort will be made to encourage research likely to benefit management. The provision of modest research facilities and possibly the award of research scholarships would encourage study of the area.

Research can be destructive and every research project will be carefully evaluated by the Park Authority and any restrictions necessary prescribed before a permit is issued for the project to begin. All researchers will be required to submit a detailed report of the methodology, results and conclusions within a stipulated time after the project ends.

Biologically there is an urgent need for a detailed inventory of the species of plants and animals present in the Park and of their distribution and ecology. A similar need exists for a detailed inventory of sites of Aboriginal importance covering the whole Park area. The collection of plant, animal, geological, pedological and archaeological specimens will not be allowed without permission but where a collection permit is given, type specimens or material will be supplied to the Park Authority to be stored in a suitable building for future reference.

Much information, particularly of past environmental change, could be gleaned from old documents and photographs of the Park and people will be encouraged, perhaps by a national appeal, to submit such information for copying and cataloguing. Ground photographs taken at fixed key positions and repeated at regular intervals in a standard manner can provide an effective means of monitoring change in the Park particularly where supplemented by detailed studies of vegetation. A series of such positions will be established and photographs taken. Colour aerial photographs will be taken of the Park as desirable.

Socially and economically it is important to explore further the motivation and attitudes of different categories of tourists so that Park management can cater better for tourist needs, lessen damage by vandalism, littering and lighting of fires and direct tourist movements better, e.g. by improvements in signposting or the better location of roads and walking tracks. Such studies will therefore be encouraged as actively as possible.

Fees

At present tourists pay a fixed fee to enter the National Park, the income from fees being considerably less than park costs. Consequently there is some justification for an increase in the entrance fee which is a very small proportion of the total cost to tourists of visiting the Park.

Progressively increasing the Park entrance fee to reduce the number of tourists is a means whereby tourist numbers could be decreased but raises complex social issues in that only the more wealthy would then be able to visit the Park.

Detailed economic and social studies are needed to formulate a rational policy with regard to entrance fees. Consideration needs to be given to varying the entrance fee according to the time of the year in order to try to lessen the extreme peaking of use and to the possibility of having a range of entrance fees perhaps related to age or mode of travel.

STAFF

Staffing and Aboriginal employment

A considerable increase in the number of staff employed is envisaged despite the transfer of the village outside the Park and is justified by the need for more detailed management. If tourism continues to grow as predicted, a staff of about 24 full-time employees and the equivalent of four full-time posts for part-time employees will be needed by the end of the first five-year period. The build-up of staff will be progressive and the rate adjusted to general progress in the implementation of the management plan. The senior staff member at the Park (Chief Warden) will be responsible for the work of all Park staff and will nominate duties and generally supervise the staff.

In making staff appointments careful attention will be paid to individual personality as well as expertise because of demands resulting from the relative isolation of the Park, the lack of amenities, the harshness of the climate and the problems of living in a small community. Another consideration is the importance of good relations with visitors.

Housing of an appropriate standard will be provided for all staff and a staff house building schedule implemented without delay. As a temporary measure use may be made of vacated motel accommodation for staff accommodation but this should only be regarded as a brief staging measure.

Aborigines should be eligible for all posts provided they have the necessary qualifications. When Aborigines are employed the terms of employment should be attuned to take account of their tribal beliefs and constraints.

Employment opportunities for Aborigines are seen to be good and highly desirable because of the special contribution they can make to Park management. Aboriginal involvement is particularly desirable in relation to maintenance and restoration of existing cultural features such as the decorated caves, to the development of the education role of the Park, e.g. in displaying indigenous plants and animals, demonstrating Aboriginal skills, constructing the dioramas and in teaching other people some of the traditions associated with the Ayers Rock-Mount Olga National Park. Equally, Aborigines will be involved in the general management of the Park, in the construction and maintenance of Park facilities, in providing information, guide and travel services and in selling Aboriginal arts and crafts in the official shop.

Staff structure

Staff currently employed in the National Park constitute a good nucleus around which to create a team combining expertise in Park protection and interpretation, maintenance of equipment and facilities and the associated office work. A high standard of recruitment is essential, and the position of Chief Warden is crucial since he will have considerable responsibility.

The staff complement after five years should be structured along the following lines which gives 20 permanent full-time staff and the equivalent of 4 full-time appointments as part-time staff members:

Permanent

- 1 Chief Warden
- 1 Deputy Warden
- 6 Rangers
- 1 Curator (Scientific)
- 1 Clerk/Cashier

1 Typist
1 Storeman
1 Mechanic
1 Carpenter
1 Painter (Buildings)
1 Heavy vehicle/tractor driver
4 Labourers

Part-time

Equivalent of 4 full-time employees.

The Park staff should be able to draw upon a variety of specialists where specific considerations have to be taken into account. Consequently funds should be set aside for the hire of people to fill essential needs as they arise from year to year, e.g. for survey work, biological recording and questioning of tourists.

Training

Few staff will be fully trained and they will be encouraged to go on training courses. Some Park employees will be selected to undertake specialised courses elsewhere. For all Park employees in-service training courses will be held at the Ayers Rock-Mount Olga National Park and regular training and discussion sessions organised. Success in additional training will be a factor in making staff promotions and within the staff structure there should be promotional opportunities for all grades of staff.

Staff transport

Sufficient transport will be provided to meet the needs of the Park staff in carrying out their duties. Generally the vehicles will be of the 4-wheel drive type and be equipped with radio so that contact can be maintained between the Park Headquarters and staff engaged on field duties. Funds should be set aside for the hiring of special vehicles, e.g. a helicopter to visit the more remote regions of the Park or a heavy vehicle for construction purposes.

A workshop to keep all vehicles in first class condition is essential and will also be used for the general maintenance of other equipment.

MANAGEMENT IMPLEMENTATION

Management priorities and finance

This management plan involves several major developments for which it is difficult to give an order of priority or costs. All are interrelated and should be implemented progressively over the next ten years.

In general it is desirable to allocate special development funds specifically for: (1) the transfer of the village and airstrip; (2) road realignment; and (3) the construction of the facility at the entrance to the Park.

The other management proposals could be incorporated as general running costs within the annual budget which needs to be increased so as to be more relevant to management needs.

Responsibilities for management policy and implementation

Experience has shown that effective management of any natural resource is best achieved if responsibility for management is vested in a single authority possessing adequate financial backing and expertise. Where a variety of interests and organisations are involved, as at the Ayers Rock-Mt Olga National Park, the responsible

authority must develop liaison procedures with other interests in order that its policy is not misunderstood and so that it can benefit from their knowledge through consultation.

Various alternatives could be adopted for the control of the Ayers Rock-Mt Olga National Park; the following seems most practical and likely to succeed.

There is considerable merit in the overall responsibility and funding being provided by the Australian Department of Environment and Conservation, or alternatively the National Parks Commission when established.

The responsible authority should establish a 'Council' of not more than nine members to advise it on general policy matters relating to the Park. The Chairman of the Council should be an independent person of some standing and the Council should include people representing the more important interests. At least four members of the Council should be Aborigines and the advice of the Department of Aboriginal Affairs should be sought in deciding how best to gain Aboriginal membership. Aboriginal interests in particular should be safeguarded by the Council through its Aboriginal members. The National Park should be seen as being an extension of, and closely linked with, the Central Australian Aboriginal Reserve, being distinguished mainly by the use made of it. Aboriginal members of the Council would have a vital role for, through them, Aboriginal culture could be protected and Aboriginal employment opportunities assured. The Council should meet as necessary but not less than once a year and report directly to the responsible authority.

Practical and other considerations suggest that for the immediate future day-to-day administration of the National Park should remain in the hands of the Northern Territory Reserves Board which would be directly answerable to the responsible authority for the National Park.

Progress reports

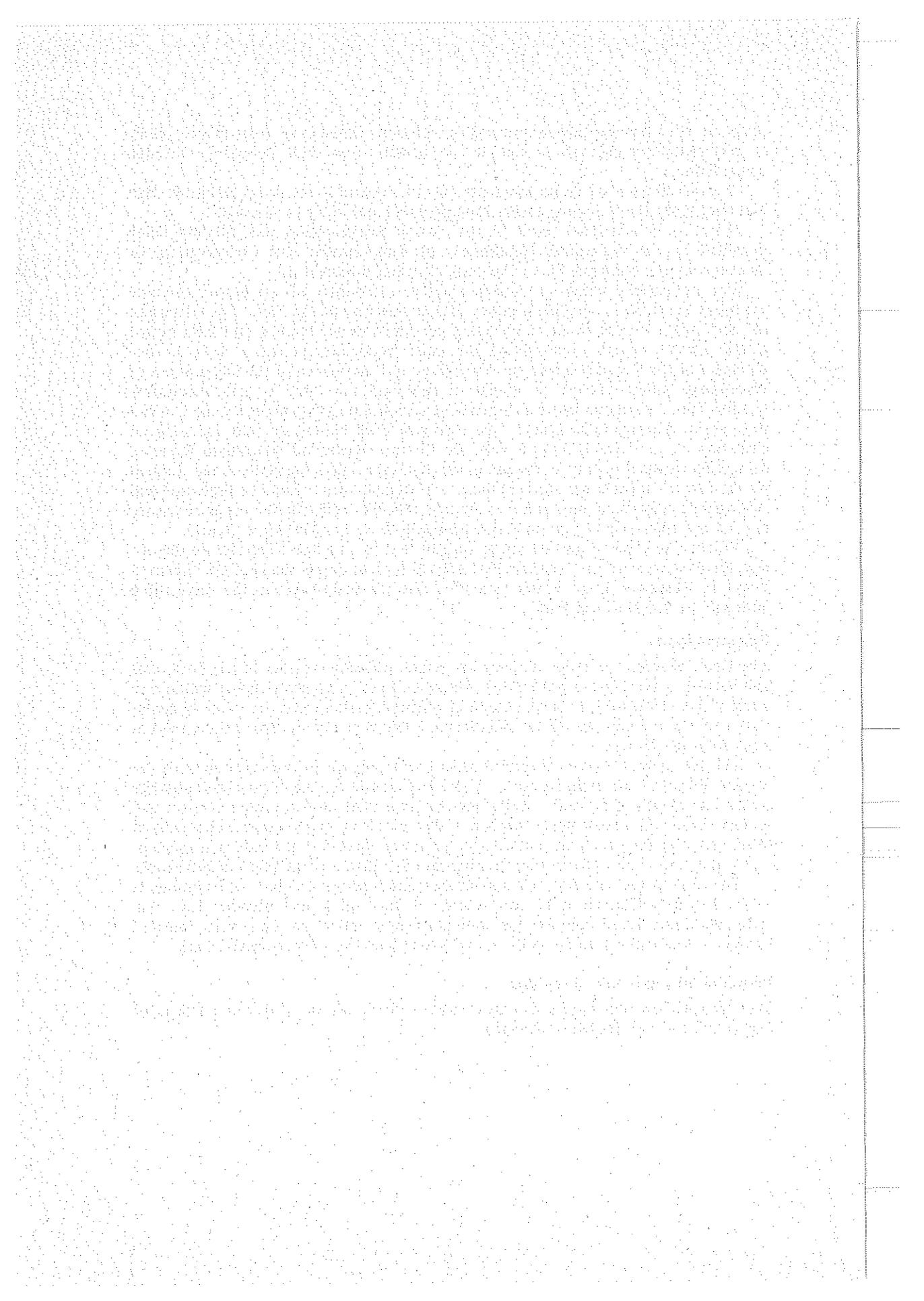
The Chief Warden, or in his absence the senior resident member of the Park staff will submit to the Northern Territory Reserves Board a monthly report within one week of the end of each calendar month in which all matters relevant to the National Park over the previous month are documented, and drawing the Board's attention to any problems arising.

The Northern Territory Reserves Board will prepare in consultation with the resident Park staff an annual progress report and submit it to the responsible authority within one month of the end of each calendar year. The annual progress report will include details of management, research, visitor numbers, expenditure and personnel movements for the past year, indicate the proposed direction of future management and supply any other information the responsible authority may reasonably require.

The responsible authority will submit the annual progress report with comments to the Advisory Council within two months of the end of the calendar year. The Advisory Council will consider the annual progress report and any other relevant matters at a meeting held annually in the Ayers Rock-Mt Olga National Park.

Period of plan and date of revision

This plan will be effective for five years after which it will be revised in the light of experience for another five-year period.



APPENDIX C

Rare and endangered mammalian species in the Ayers Rock-Mount Olga National Park

Mulgara	<i>Dasycercus cristicauda</i>
Marsupial Mole	<i>Notoryctes typhlops</i>
Striped-faced Dunnart	<i>Sminthopsis froggatti</i>
Rabbit-eared Bandicoot	<i>Macrotis lagotis</i>
False Vampire Bat	<i>Pseudomys desertor</i>
Brown Desert Mouse	<i>Macroderma gigas</i>

Probable number of extinct mammalian species in the Ayers Rock-Mount Olga National Park

Brush-tailed Marsupial Rat	<i>Dasyuroides byrnei</i>
Hair-footed Sminthopsis	<i>Sminthopsis hirtipes</i>
Short-tailed Hopping Mouse	<i>Notomys amplus</i>
Waite's Mouse	<i>Pseudomys waitei</i>
White-tailed Sticknest Rat	<i>Leporillus upicalis</i>
Thick-tailed Rat	<i>Zyzomys pedunculatus</i>
Desert Bandicoot	<i>Perameles eremiana</i>
Lesser Rabbit-eared Bandicoot	<i>Macrotis leucura</i>
Pig-footed Bandicoot	<i>Chaeropus ecaudatus</i>
Hare Wallaby	<i>Lagorchestes hirsutus</i>
Brush-tail Possum	<i>Trichosurus vulpecula</i>
Western Native Cat	<i>Dasyurinus geoffroyi</i>
Neck-pouched Hopping Mouse	<i>Notomys cervinus</i>

Mammalian species likely to be observed by visitors

Fat-tailed Mouse	<i>Sminthopsis spp.</i>
Wallaby	<i>Petrogale lateralis</i>
Euro	<i>Macropus robustus</i>
Red Kangaroo	<i>Megaleia rufa</i>
Hopping Mouse	<i>Antechinomys spenceri</i>
Small Mouse	<i>Pseudomys hermannsburgensis</i> or <i>Mus musculus</i>
Dingo	<i>Canis dingo</i>

THE UNIVERSITY OF CHICAGO

PHYSICS DEPARTMENT

PHYSICS 350

LECTURE 10

STATISTICAL MECHANICS

PROFESSOR [Name]

DATE