

Nature Conservation in Lesotho

Report on
Current Progress and Forward Planning

by
Dr. Donald N. McVean
IUCN Consultant

Report of
International Union for Conservation of Nature and Natural Resources
to the Government of Lesotho
prepared with the financial support of
the United Nations Environment Programme

Morges, Switzerland

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FOREWORD

Following a UNEP Mission to the Kingdom of Lesotho by Mr. A.L.D. Mongi, UNEP Advisor on Conservation and Wildlife from 29 January to 3 February 1975 in which he identified urgent need for a short-term advisory consultancy to the Kingdom to work out details on matters related to nature conservation, the Government of Lesotho approached UNEP for the provision of such a consultant.

International Union for Conservation of Nature and Natural Resources (IUCN), which works in close cooperation with UNEP in the promotion of conservation, was requested to carry out this task under UNEP/IUCN Project FP-1103-75-04. This arrangement made it possible to send an IUCN Consultant for three months the result of which is the subject of this report.

IUCN acknowledges with gratitude the cooperation given to the Consultant by the Kingdom of Lesotho through the various Ministries, private bodies and individuals, and to the UNDP Resident Representative; and lastly to UNEP for making the funds available.

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GENERAL SUMMARY

1. The second and third sections of the Report are concerned with the natural environment of Lesotho and the way in which this has been modified over the last few centuries by direct destruction of woodland and scrub and the larger wildlife and, indirectly, by associated veld burning, human population pressure and the grazing of domestic live-stock. This leads on to the consideration of what remains of natural vegetation, individual plant species and animal life, including birds, and to what extent these merit conservation effort.
2. The history of conservation legislation in Lesotho is briefly reviewed in section 4 and suggestions are made for improvements in the existing National Parks Act 1975 to meet the special requirements of the Kingdom and in line with the current international approach to environmental conservation. A suitable National Parks organization for the implementation of the Act's provisions is outlined. The various options open in slotting such an organization into the existing administrative framework are explored.
3. The final section of the Report (section 9) deals with the staffing requirements of the National Parks Organization visualised in section 4 from its Director to the most junior grade of Ranger. The necessary qualifications are considered in relation to courses presently on offer in Tanzania and the Republic of South Africa. It is concluded that a serious hiatus in trained staff at all levels is inevitable no matter what steps are taken now to meet future requirements. Some suggestions are made for coping with these difficulties by means of internal and external training programmes and the temporary use of expatriate staff.
4. Remaining sections 5 to 8 are concerned with the existing "National Park" at Sehlabathebe and with assessments of other suggested National Parks and Nature Reserves throughout the country. Two new proposals are advanced in an attempt to fill some of the gaps that have been left in a complete coverage of representative ecosystem conservation in Lesotho.
5. In section 5 a brief history is given of the development of Sehlabathebe "National Park". Its environmental features and its plant and animal life are described and some assessment is made of the way in which these have been managed so far. Alternative strategies for the future development of the Park in relation to boundary fencing, access roads and tourism are considered and an outline management plan is worked out for the recommended direction of development.

6. Section 6 deals with the Drakensberg escarpment proposal in some detail with particular reference to the quality of the alpine vegetation, possible boundaries and the prospects for management. Two possible schemes are suggested, the one involving incorporation of both the escarpment area and Sehlabathebe as Nature Reserves in a larger Lesotho National Park, the second for an independent Wilderness Reserve buffered by zones of controlled land use.

7. Sections 7 and 8 consider the remaining Park and Reserve proposals and the smaller conservation sites respectively. The proposed Ongeluk's Nek area is regarded as unsuitable for a National Park but the Qeme Plateau proposal is endorsed with certain reservations. The Senqu River Gorges are approved for further survey with a view to the possible formation of several small Nature Reserves, either independently or incorporated in the wider Lesotho National Park. Two new suggestions for major Reserves are put forward, one in the upper Makhaleng River catchment, the other in the lower Quthing Valley. The small sites of predominantly biological interest (as opposed to cultural and historical sites) that have been suggested for conservation in the Tourist Development Plan of ARC Consultants are reassessed. Two of these sites are regarded as unsuitable for national action while the remainder are endorsed.

PRINCIPAL RECOMMENDATIONS

1. The National Parks Act 1975 should be made operational immediately (4.2)
2. The shortcomings of the present Act should also be recognised and a more appropriate Bill drafted along the lines now suggested (4.2)
3. The Board of Trustees and its executive Parks and Reserves Organization should form an autonomous body either attached to the Prime Minister's Office or to the Ministry of Agriculture or to Interior (4.4)
4. The Board of Trustees should have a permanent Consultative Panel composed chiefly of the present CCS and PPC (4.4)
5. There should be no attempt to emulate the form of National Park current within the Republic of South Africa but, instead, Lesotho should develop its own style and management (3.5)
6. The present Sehlabathebe "National Park" should either be redesignated and managed as a Nature Reserve attached to the larger Lesotho National Park or it should be zoned as suggested into Nature Reserve and Tourist Facilities regions (5.3)
7. Sehlabathebe (or at least the appropriate zone) should be regarded as a "Managed Nature Reserve" and an appropriate management plan formulated along the lines suggested (5.4, 5.5)
8. The Sehlabathebe perimeter fence should be re-aligned along the watersheds according to the plan prepared by the Park Administrator once certain zoning and management decisions have been taken (5.5.1)
9. The proposed road from Bushman's Nek should ideally bypass Sehlabathebe and service any tourist facilities by means of a spur from the Leqooa Valley (5.3.3)
10. If the proposed road from Bushman's Nek does traverse part of Sehlabathebe Nature Reserve it should be taken by the shortest possible route with least disturbance of the local habitats and ecosystems.
11. A single Lesotho National Park is proposed incorporating Sehlabathebe Nature Reserve and an Eastern Escarpment Wilderness Area, with a wide belt of land from Oxbow to Sehlabathebe as a buffer or conservation zone in which present land uses would continue - but subject to the provisions of the Land Husbandry Act 1969 and other environmental safeguards (6.3)

12. Nature Reserve management would normally be carried out by the Senior Ranger acting on overall instructions of a Reserve Management Committee appointed by the Board of Trustees. It is, however, proposed that overall management of the Lesotho National Park would be conducted by a Park Authority involving the Ministries of Agriculture, Tourism, Interior and Rural Development as well as the Parks and Reserves Organization. Nature Reserve management within the Park would be as above (11).
13. Qeme Plateau is regarded as of Nature Reserve status and the plan to introduce a selection of game animals is accepted as theoretically workable. However, it is essential that the management of this project should be carried out by the proposed Parks and Reserves Organization at all stages and not by L.T.C. in any capacity. The title Qeme Game Park is suggested (7.2).
14. Two new Nature Reserve proposals are advanced, one in the lower Quthing Valley, the second in the upper Makhalleng Valley, and both designed to conserve rare and vanishing types of woodland and scrub (7.4).
15. The proposed Ongeluk's Nek National Park is not regarded as suitable for either a National Park or Nature Reserve. Instead, a small Bird Sanctuary is suggested at the present lake on the upper Quthing River (7.1).
16. The Senqu River Gorges are not regarded as suitable for a single, separate National Park but further survey should be conducted to determine to what extent a number of smaller Nature Reserves would be appropriate. These could be attached to the Lesotho National Park (7.3).
17. Of the small sites suggested as Reserves by ARC Consultants Maletsunyane, Ketane, Maphotong, and Tsa Kholo are accepted as of Nature Reserve status. Masitise woodland and the Roma vegetation sites are not regarded as suitable (8.1 to 8.5).
18. Lesotho should endeavour to develop its own training programme in environmental conservation and Nature Reserve management. Untrained or partly trained personnel will have to be employed in the first few years while training of candidates goes forward, either in Lesotho or in other countries. The important post of Director of Parks and Reserves will have to be filled by an expatriate on secondment or short term contract for a period of two or three years pending the full qualification of a Mosotho understudy (9.1 to 9.6)
19. The programme of environmental conservation should be country-wide and not confined to Nature Reserve sites (3.1 and 3.5).

20. A survey should be initiated and operated by the Board of Trustees to identify the best of the remaining "representative ecosystems" and the need for special "Species Reserves" (3.3, 3.4, and 4.2).
21. While conservation and tourism should be linked in many ways for their mutual benefit the conservation programme should start from the premise that environmental conservation is a valid form of land use in its own right comparable to agriculture and forestry (3.5).

NATURE CONSERVATION IN LESOTHO

1. INTRODUCTION

This Report on the status of Nature Conservation in the Kingdom of Lesotho has been prepared in response to three principal terms of reference which were:

- a. To render assistance to Lesotho Government with the consolidation of the existing Sehlabathebe "National Park" and with the establishment of a second National Park along the Drakensberg escarpment to the north of Sehlabathebe. This would involve a general environmental report on the Sehlabathebe and Drakensberg areas, with particular reference to the choice of boundaries and the land use of adjacent areas, and recommendations for subsequent management of the two Parks.
- b. To assist in current efforts at refinement of the Kingdom's conservation legislation.
- c. To identify the training requirements of guards and wardens in the projected National Parks Organization and to recommend how these requirements might be met.

As the assignment progressed it became apparent that to be of real assistance to the Lesotho Administration the Report would have to range rather more widely over the conservation field, from its legislative basis to already existing proposals for a complete network of Parks and Reserves, including those named above. The original terms of reference were therefore exceeded in accordance with the requirements and wishes of the various Ministry officials in Maseru involved with nature conservation problems.

The work programme extended from 16 November 1976 to 28 January 1977. Three days were spent in consultation with members of UNEP, Nairobi, at the start and completion of the assignment; the remainder of the time was spent in Lesotho. Field work occupied 31 days, including 18 days at Sehlabathebe, and involved visits to all major National Parks and small sites recommended. The remainder of the time was spent in Maseru in discussion with Government officials, in reading all relevant files and reports and in attending meetings of the Coordination Committee for Sehlabathebe and the Protection and Preservation Commission. Most of the Report preparation was carried out before leaving Maseru and many of the sections were copied and delivered to Mr. H.W. Cooper, Chairman of the Sehlabathebe Committee, on 24 January with the proviso that this was not to be regarded as an official submission.

Itinerary

November	17	:	Nairobi. Briefing at UNEP
	19-30	:	Maseru
December	1-2	:	Oxbow area and north end proposed Drakensberg Ridge Park
	3-15	:	Sehlabathebe National Park
	16-21	:	Maseru
	21-31	:	Tour of various proposed sites and Parks
January	1-26	:	Maseru
	27-28	:	Nairobi. Debriefing at UNEP

In Maseru talks were held with the following officials :

- Mr. V.P. Machai,
Deputy Permanent Secretary, Ministry of Community and Rural Development (22/11/76)
- Mr. L.B. Monyake,
Permanent Secretary, Rural Development (22/11/76)
- Mrs. L. Mohape,
Herbarium Curator, Agric. Research Station,
Ministry of Agriculture (22/11/76)
- Mr. C. Tsane,
Deputy Permanent Secretary (Technical), Ministry of Agriculture (23/11/76)
- Mr. O.T. Nzeku,
Permanent Secretary for Tourism (23/11/76)
- Mr. N.K. Akhosi,
Projects Officer, Tourism (23/11/76)
- Mr. H.W. Cooper,
Chief Conservation Officer, Ministry of Agriculture
(various dates)
- Mr. P. Modiano,
Planning Office, Ministry of Finance (26/11/76)
- Mr. R.M.T. Phillips,
Chief Projects Officer, Rural Development (various dates)
- Mr. Mabathoana,
Senior Permanent Secretary (13/1/77)
- Mr. P.L. Pitso,
Permanent Secretary, Rural Development
(successor to Mr. Monyake)
- Dr. D. Phororo,
Permanent Secretary, Ministry of Agriculture (25/1/77)

Meetings of the Coordinating Committee for Sehlabathebe (CCS) were attended on 20/12/76, 24/1/77 and 29/11/76.

A meeting of the Protection and Preservation Commission (PPC) was attended on 23/11/76.

2. THE NATURAL ENVIRONMENT OF LESOTHO

2.1. The Vegetation

It can be surmised from the accounts of early travellers in the region (Germond 1967) and from the evidence of surviving natural vegetation in Lesotho and surrounding areas of southern Africa that up until the early 19th century the lowlands of the country were occupied, as at present, by grassland but with some open savanna woodland and riverside willow thickets. There would have been scattered patches of woodland here and there, especially on scarp slopes and in sheltered kloofs (ravine) and hollows in the hills. This state of affairs would have been maintained by periodic natural and man-made fires. The tree species of this zone appear to have included Olea capensis, Cussonia spicata, Podocarpus latifolius, Euclea ramosa and Qcotea bullata, Valley flats would have contained tussock grass marshes, reed and Cyperus beds which formed natural water spreading systems over the flood plains, as they still do in a few places such as the catchment of the Tsana Talana River at Mafeteng. These vegetation types probably extended to some 2,000 m or so to be succeeded by montane scrub woodland dominated by Leucosidea sericea and Buddleia salviifolia, with patches of tall herb meadow in the moister places and giving way quickly to grassland on the ridges. The Buddleia- Leucosidea scrub woodland may sometimes have been continuous with a more stunted scrub of Passerina, Cliffortia, Philippia and Athanasia especially on north slopes and shallow, rocky soils. Alpine vegetation above 2,900 m would have differed little from that of today and consisted of spring bogs, wet herb and sedge meadows, Merxmullera (Danthonia) tussock grassland, Festuca - Pentaschistis grassland, various types of Erica and Helichrysum heaths and open feldmark.

Timber utilisation and the increased incidence of fires in the 19th century converted the woody vegetation to grassland which merged with the subalpine and alpine grasslands of the higher mountains. Early records mention the felling of substantial numbers of trees up to 20 m tall on the hill slopes so that there must have been considerable forest pockets such as still exist on the Natal side of the escarpment. All surviving woody vegetation suffered severely during the cold winters of the late 19th century when fuel was at a premium and there was also a shortage of animal dung for burning as a result of a disastrous rinderpest outbreak. A recent increase in low scrub on rocky slopes (largely invading Karoo elements such as Chrysocoma tenuifolia) have followed accelerated soil erosion and the protection from grass fires afforded by the present close grazing of the veld. Alpine heath species have been selectively browsed and the heaths reduced in area by veld burning.

2.2. Animal Life

Plains game seem never to have been as abundant over the area of present-day Lesotho as in neighbouring regions of southern Africa while, in the sub-alpine and alpine zones, there was increasingly restricted use due to climatic extremes and the shortness of the growing season. However, these certainly included blesbok, wildebeest, zebra, eland (large herds until 1890) and at least five other species of antelope. Lion followed the herds of game. Most of these species have now disappeared as a result of direct slaughter but partly through the intensive competition from large numbers of domestic stock on the available rangeland. A few species of mountain antelope remain in very small numbers, notably grey rhebuck *Pelea capreolus*, mountain reedbuck *Redunca fulvorufula* and perhaps klipspringer *Oreotragus oreotragus*. Baboons are still present but rare while leopard and caracal, said to be present, are rarely seen. Eland and oribi have been sighted recently at Sehlabathebe. The bird list has probably not been reduced to the same extent although woodland destruction and the drying out of marshes and reedbeds in the lowlands, combined with the depredations of nest hunting herdboys, must have had their effect so that the present total of about 240 species is less than would be found in other comparable areas of southern Africa. Lesotho is, however, rich in lowland cliff-breeding birds and can boast a remarkable concentration of Lammergeier as well as a small number of Bald Ibis.

The probably endemic cyprinid fish (minnow) *Oreodaimon quathlambae* is in a precarious position, being under threat both from river siltation and predation by introduced trout in its few mountain localities (see 5.2).

2.3. Soil Erosion

In parallel with this impoverishment of vegetation and wildlife, there has been a serious loss of soil verging on the disastrous in some areas. Accelerated erosion is universal from the cultivated fields of the lowlands to the highest mountain rangeland. Contour cultivation, with provision of grassed buffer strips and waterways for the safe disposal of runoff, was made obligatory in the mid-thirties and remains Lesotho's outstanding achievement in the field of soil erosion control. The measures were well conceived and well executed so that they still perform fairly well at the present day although there has been a gradual deterioration in the standard of maintenance. Cultivation without erosion control measures has also been extended gradually to higher altitudes and onto steeper slopes over the last thirty years. Perhaps most serious of all has been the sustained overstocking of the rangeland and the extreme socio-economic difficulty of any implementation of grazing control. As well, veld burning has often verged on the irresponsible. These have resulted in the universal presence of rain splash (sheet) erosion of the rangeland and the conversion of formerly clear-running mountain streams into periodic muddy torrents choked with sand and boulders. Large areas of the Cave Sandstone and underlying formations have been completely stripped of topsoil and subsoil alike. In the alpine and subalpine zones the most serious effect is probably the trampling of cattle and horses in the peaty soils of spring bogs and marshes. Not only does this often result in complete loss of soil but the springs themselves may dry out

and the local watertable falls. Since these springs form the headwaters of the most important rivers of southern Africa, such a threat to downstream flood regulation must be regarded with great anxiety.

3. PRINCIPAL CONSERVATION REQUIREMENTS

3.1. It is clear from even a superficial examination of the present environmental situation in Lesotho where the main thrust of the nature conservation movement in the Kingdom must be. First of all, in view of the terribly eroded state of the rangeland, at all levels from lowlands to the alpine ridges, soil conservation should be regarded as basic to nature conservation, here if anywhere, and that the environmental conservation effort should be generally applied as well as directed to a few special sites - call them National Parks, Nature Reserves or what you will. It must also be emphasised that environmental or nature conservation is an applied science, comparable to agriculture and forestry, and that the management of land for conservation purposes cannot be left in untrained hands for ancillary purposes such as education or tourism however legitimate and even laudable these purposes may be. By no means all agriculturists, academic biologists or even ecologists are trained or experienced in the applied aspects of ecology which are required.

Although soil conservation recommendations do not form part of the present terms of reference some attempt will be made to show in this report how soil and nature conservation can and must be integrated in future policies. Soil conservation has been virtually the only form of conservation practised in Lesotho until recently and it has a commendable history of around 50 years, at least on the cultivated land.

3.2. It has already been pointed out by ARC Consultants in their Report of 1975 that there is in Lesotho no possibility for, nor need for, large Game Reserves or National Parks along the lines followed in other African countries. The only extensive tracts of uninhabited land remaining close to its original state prior to the advent of man lie in the alpine and upper subalpine zones and it is here that the only possibility exists of setting up a Reserve of at least National Park size. It has to be accepted that this must be an environmental (largely scenic and vegetational) reserve lacking any concentration of the larger animal life and with no scope for "restocking". There is, however one possibility for the reintroduction of game animals on a substantial scale and by chance this occurs within easy reach of Maseru on the Qeme Plateau.

3.3. Most conservation must lie in the selection for preservation of such fragments of still representative ecosystems as remain in the country. These must be chosen from the following categories :

- a. alpine grasslands, wetlands, feldmark and heath
- b. subalpine grasslands, wetlands, heath and scrub
- c. montane and lowland grasslands, wetlands, lakes, woodlands and scrub.

Subalpine grassland and wetlands have already been well represented in the Sehlabathebe National Park. All alpine categories will be taken care of within the Eastern Escarpment proposal and remaining types will be distributed throughout the suggested Nature Reserves, Bird Sanctuaries and other small sites.

3.4. The need for small Species Reserves, built around the presence of one or two threatened species of plant or animal, which are not present in the larger more comprehensive reserve areas, must also be considered. At the moment the spiral aloe (*Aloe polyphylla*) is the only species requiring such provision; other rare and/or endemic species being catered for in the larger Reserves. Further study may reveal that there are others. This aspect of the conservation effort is recommended in 4.2 below. While the flora of Lesotho is now reasonably well known there has never been a systematic study of vegetation types comparable to those that have taken place in adjacent areas of the Republic (see, however, Herbst & Roberts 1974; van Zinderen Bakker 1955; van Zinderen Bakker and Werger 1974). Lesotho has not benefited, as many other countries have done, from participation in the International Biological Programme now completed. Studies of aquatic biology, terrestrial invertebrates and small mammals, for instance, are almost entirely lacking.

3.5. In view of the importance to Lesotho of developing a tourist industry, some attention must be paid to the best ways in which conservation and tourism could be linked to their mutual benefit. Although the emphasis of the present Report, unlike that of Chapter 6 in the ARC Development Plan for Tourism, is not upon the tourist aspects of National Parks and Reserves, such aspects have been kept in mind throughout.

From the onset of the movement there has been a tendency in this country to regard Parks and Reserves as a valid form of land use only because of their value in encouraging visitors to come and spend their money here, with conservation of the Kingdom's heritage of fauna and flora as a mere adjunct to the more important commercial business. This is evident from the wording of the Second Five Year Development Plan where we find that the site for a National Park was "allocated" at Sehlabathebe and that Qeme is to be regarded as a "recreational area to which herds of game animals are to be annexed".

The present consultant believes very strongly that this is the wrong approach not only from the conservation point of view but also, in the long run, for the viability of the tourist industry. Lesotho tourism needs the conservation of the whole environment to make the country an even pleasanter place to visit; with a more prosperous agriculture, more trees, more wild animals and birds everywhere, and cleaner water with better fishing in the rivers. Parks and Reserves must be managed as the cream of the country's environmental resources and, to this end, the tourist has to be kept somewhat at arms length in them.

The gist of the proposals now put forward is that National Parks in the usual Africa style (specifically that of the Republic) are not appropriate in the Lesotho context; the neighbouring Republic will always be able to do this sort of thing better. The Kingdom has neither the wide uninhabited spaces, the big game nor, at present, the road and air communications necessary for such an

approach. It does have the scenic resources, potentially excellent trout fishing and a wealth of small sites of cultural, historical and natural history interest. The average visitor to Lesotho will always be a car tourist and interested in good roads, picnic places, camping sites and a good choice of overnight accommodation as well as numerous points of scenic and other interest at which to stop for a short time. For this reason, and because it is also the strategy dictated by the environmental situation of the country, the present report concentrates upon the smaller areas with more modest resources which Lesotho could manage well. It also agrees with the ARC Consultants that it would be a mistake to promote car-based tourism on existing gravel and dirt roads and that modernisation, upgrading and expansion of existing hotels should have priority.

Attempts to create a number of large National Parks which could be financially self-supporting would be disastrous from the conservation point of view and also for tourism in the long run. Environmental conservation should never be expected to pay its way in terms of annual book-keeping (although it has occasionally done so) but it will certainly pay in the long term when the intangible benefits are quantified.

In one sense the whole of the country could be regarded as a national park and, in future, car tourists intending to camp here could be asked to pay a small levy at ports of entry corresponding to the existing hotel levy, while those using designated camp and caravan sites with special facilities would pay a small extra charge at the sites. Camping and all tourist facilities would be adjacent to but outside Nature Reserves. In the case of the one large National Park now proposed in section 6, these would lie within the conservation or buffer zone and thus be subject to strict controls over their environmental impact. Facilities near ports of entry would thus give the best returns in terms of expenditure on road improvement but, along the eastern escarpment, great care should be taken to avoid developments on the headwaters of the rivers.

There has been a tendency to exaggerate another of Lesotho's unique resources in the southern African context - snow cover for skiing. Climatic records and certain vegetation indications on the ground certainly point to the chosen sites at Oxbow as the most suitable in the country. However, expectations appear to be based on better than average years for snow cover and have not sufficiently taken into account the many years of scanty snow that undoubtedly occur. The vegetation of the slopes is a better indication of reliability and depth of snow cover for skiing than the very short run of climatic records and observations available. This indicates that the viability of skiing development at Oxbow is very marginal indeed. Prospects for artificial snow production are said to be good, however, and there will always be a (sufficient?) number of individuals prepared to tolerate the artificiality of the whole development - or indeed the complete absence of skiable snow - provided the surrounding activities and some of the mystique are there. Skiing on grass slopes has been observed by the present consultant at Oxbow in November - which, if it grows in popularity, could pose another problem for the soil conservationist.

4. THE LEGISLATIVE BASE & ADMINISTRATION

4.1. Historical

Amongst early legislation directed towards the preservation of Lesotho environment and wildlife the Game Preservation Proclamation No 33, 1951 provided for (section 8.1) the creation of Wildlife Sanctuaries which, however, were only vaguely defined. Following Independence in 1966 protective legislation was passed for certain plant and animal species, together with historical monuments, archaeological treasures, etc., in the Historical Monuments, Relics, Fauna and Flora Act No 41, 1967. Under this Act a commission was created for the preservation of natural and historical monuments, relics and antiques and the protection of fauna and flora, usually known as the Protection and Preservation Commission or PPC. Under section 8 (a) of the Act the Minister responsible (Education), on recommendation of the Commission, may proclaim as "Monuments" any areas of land having distinctive or beautiful scenery or geological formations, any area of land containing a rare or distinctive or beautiful flora or fauna, "any area of land containing objects of archaeological, historical or scientific interest, any waterfall, cave, grotto, avenue of trees or building and any other object (whether natural or constructed by man) of aesthetic, historical, archaeological or scientific value or interest". This Act was invoked once in 1969 (Legal Notice No. 36) to proclaim nine sites as Protected Areas, including the historical plateau of Thaba Bosiu and certain cave paintings and fossil impressions. Section 10 of the Act lays down penalties for removal, destruction or damage to protected fauna or flora as detailed in Legal Notice No 36.

The Land Husbandry Act 1969 (Government Gazette Vol. IV No 23) provided for, amongst other things :

- a. the proper management of trees and other natural flora;
- b. the control of grazing and the introduction of veld management;
- c. the control and regulation of numbers and species of livestock which might be grazed on designated land;
- d. prohibition or restriction of cultivation or grazing of designated land, including vleis, sponges, marshes, swamps and reed beds;
- e. prescription of anti-erosion measures on designated land.

In 1970 Government Notice No 34 created Sehlabathebe Wildlife Sanctuary and "National Park" under Game Preservation Proclamation No 33.

The National Parks Act 1975, based on that of the Republic of South Africa, was passed by Parliament in March 1975, received the Royal Assent and was gazetted in August of that year. Its date of effect has not yet been gazetted and the legislation is therefore not operative.

Enforcement of wildlife protection in Lesotho can also be taken under Proclamation No 43 of 1914 relating to wild birds, their skins and plumage and Proclamation No 5 of 1939 relating to the sale of game animals and their hides.

Finally, Lesotho has not yet signed the 1968 African Convention on Conservation of Nature and Natural Resources (Algiers, 1968) and, while a signatory to the Convention on International Trade in Endangered Species of Wild Fauna and Flora, opened on 3 March 1973 and signed by Lesotho on 17 July 1974, has not ratified that signature.

The current situation in conservation legislation in Lesotho is thus somewhat confused and administratively chaotic, as has been pointed out in the ARC Development Plan for Tourism (ARC, 1975).

4.2. Proposed Environmental Conservation Bill

The present consultant agrees with the opinion expressed in the Report of ARC Consultants that the National Parks Bill (now Act) is inadequate as it stands to form a basis for the environmental conservation approach appropriate to Lesotho and that it is important to reassure world opinion, especially international funding bodies, that Lesotho Parks and Reserves have a sound legislation base, are not subject to political influence and are controlled by independent permanent Trustees who serve only the interest of the Kingdom's natural and cultural heritage. The Draft Conservation Bill of the ARC Appendix F comes closer to the present ideal than does the existing proposal with alterations as shown below (4.3). In making these alterations the opinions of Mr. Georg van der Goltz, then Senior Agricultural Economist in Maseru, as expressed in memoranda of 6 July 1973 and 2 January 1975, have been taken into account.

Changes in legislation will necessarily take time; it is therefore proposed that the existing Act should be made operational immediately to enable the work of establishing and managing Parks and Reserves to proceed without further delay. The necessary steps have been outlined by Mr. P.O. Cookingham in a recent memorandum to CCS of 17 January 1977.

Most of the changes now proposed are nomenclatural, including the title of the Bill. The major changes of substance suggested are along the following lines :

- a. Insertion of clauses allowing for the formation of an environmental survey or biological inventory. This is urgently required in view of the paucity of information about the indigenous plants, animals and their communities in Lesotho. Only when the findings of this survey become known can it be assured that the best examples of the representative ecosystems of the country have been chosen for conservation in perpetuity.
- b. Arbitrary powers of search and arrest without warrant are surely inappropriate in the Lesotho context and especially where control of small Nature Reserves rather than large tracts of wild country are concerned.
- c. Members of the present CCS and PPC with special scientific or other expertise, and who are not made actual members of the Board of Trustees, should form a permanent consultative panel whose advice on such matters would be constantly available to the Board.

4.3. Suggested Changes in ARC Draft Bill

PROPOSED ENVIRONMENTAL CONSERVATION BILL

To provide for the establishment and maintenance of National Parks, Nature Reserves, Game Parks, Conservation Areas, Scenic, Geological, Historical and Cultural Sites; the conservation of all animal life, vegetation and natural habitats and objects of scientific, historical or cultural interest; to initiate and operate a survey of the Kingdom's environmental and cultural resources with a view to their proper conservation; and to provide for the control, development and management of such Parks, Reserves and Sites as may be declared; and any other incidental matters.

1. This Act may be cited as the "Environmental Conservation Act 19XX" ..
2. "Area under the control of the Board" includes any National Park, Nature Reserve, Game Park, Conservation Area, Scenic, Geological, Historical or Cultural Site.
"Site means any area or place set aside by the Board for whatever purpose.
4. (1) For the purpose of developing, controlling, maintaining and managing National Parks, Nature Reserves, Game Parks, Conservation Areas, Scenic, Geological, Historical and Cultural Sites the Minister...
 - (a) ... by the name of the Lesotho Environmental Conservation Board of Trustees...
 - (2) Omit (vii), (viii), (ix), (x). Add Permanent Secretary, Ministry of Education.
 - (5) (iv) Omit "or is otherwise deemed by the Minister to be incapable of performing the duties of his office" .
 - (10) The Board shall establish a permanent advisory and consultative panel composed of persons whose knowledge of animals, vegetation, natural habitats, rock paintings and antiquities will be valuable to the Board.
5. (1) It shall be the duty and function of the Board to initiate and operate a survey of environmental and cultural resources and to control, manage and maintain National Parks, Nature Reserves, Game Parks, Conservation Areas, Scenic, Geological, Historical and Cultural Sites and any other...
 - (2) (e) Omit
 - (3) (4) Omit
8. This should be rewritten to exclude powers of arrest or search without warrant, especially outwith controlled areas.

4.4. Administrative Framework

It appears to be generally agreed within Central Administration that the Ministry of Rural Development is no longer appropriate as the body assuming day to day management of Sehlabachebe National Park. There is, however, general lack of agreement on which Ministry or other Government body should

assume this function, and the wider one of National Parks and Nature Reserves as a whole. A movement has already been initiated to have the executive function of the future National Parks organization transferred to (Soil) Conservation Division of the Ministry of Agriculture, the Ministry in which present activities at Sehlabathebe are legislatively based.

Present activities at Sehlabathebe involve Fisheries, Tourism and Nature Conservation in a direct way and Agriculture indirectly by reason of the withdrawal of the area from stock grazing. As envisaged in the forward planning of the present report the future Parks and Reserves Organization will involve Agriculture more directly through soil conservation work on both Reserves and Conservation Areas and grazing control on the latter. Tourism will be involved less directly than at present in Sehlabathebe but directly within Conservation Areas. Education will be directly involved through the incorporation of the present Protection and Preservation Commission in the Board of Trustees and its permanent Consultative Panel.

As well as being legislatively based in Agriculture the present Sehlabathebe organization has spent a short period (some nine months) attached to the Ministry of Interior before taking up its present position in Rural Development. Several solutions to the problem of a suitable base for the future National Parks organization present themselves, none being intrinsically a guarantee of success. So much must lie with the personalities of the senior administrators involved, and their compatibility in administrative contacts, that the picture can change dramatically as various office bearers come and go.

The solution at present favoured by the Planning Office of the Ministry of Finance (as set out in a memorandum by Mr. P. Modiano, 3 December 1976 - Implementation of National Parks and Protection and Preservation Projects) is that policy control should lie with the Ministry of Interior and executive responsibility with the Lesotho Tourist Corporation. Although the present consultant agrees that Interior would be an appropriate home for the proposed organization (as it is in many other countries) it should be clear from what has been said in other sections of this report that LTC (a subsidiary of Lesotho National Development Corporation) would be inappropriate as its executive arm and that the results of such a move could be disastrous for the cause of nature conservation in the Kingdom. Under the Planning Office scheme, also, the National Parks Board of Trustees would remain separate from the Protection and Preservation Commission (PPC) although the two bodies would be working together on many sites.

The ARC Consultants expressed the opinion that a separate Ministry of Environmental Conservation should eventually be set up in view of the "fundamental conflict" existing between agriculture and nature conservation. The present consultant cannot agree that such a conflict need exist and this Report has been at pains to emphasise the many points of common concern that exist in these two fields. Indeed, many of the powers required for successful operation of Parks and Reserves already exist under the Land Husbandry Act 1969 (see 4.1). There is more common ground between agriculture and nature conservation than between the latter and tourism. A memorandum by Mr. H.W. Cooper, Chief

Conservation Officer, Ministry of Agriculture, points out that the Parks Service would have open to it (as a section within his Division) expertise in engineering, soil science, soil conservation, grassland ecology and range management as well as extension training and forestry expertise from the Woodlots Organization.

Other things being equal, then, the ideal solution for Parks and Reserves would seem to be the creation of a single autonomous body (probably non-Ministerial) and incorporating in its Board of Trustees the present Sehlabathebe Coordinating Committee and part, at least, of the Protection and Preservation Commission in the form of a permanent Advisory Panel. The Board of Trustees would appoint a Director and other full-time staff to form their executive arm. Exploitation of tourist potential would be assured by the presence on the Board of the Secretary for Tourism and the Managing Director, LNDC. A separate Ministry of Environment could well prove too unwieldy and all-embracing an instrument to give sufficient attention to Parks and Reserves and would involve much reshuffling among existing Ministries. Attachment to either Agriculture or Interior are, however, workable options.

There remains the possibility that the embryo Parks and Reserves Organization could be nourished directly by the Prime Minister's Office, with ultimate responsibility resting with the Minister to the P.M. It should be noted in this connection that much of the success of the U.K. Nature Conservancy in its early days was due to the fact that it remained entirely outside the Scientific Civil Service administration and came under the direct control of the Privy Council. This is an appropriate solution for new and small departments and assures that funding difficulties do not hamper early development. Another solution may be appropriate in later years.

5. SEHLABATHEBE NATIONAL PARK

5.1. History Of Its Development

The Sehlabathebe area was first proposed as a National Park in a memorandum by Mr. R.M.T. Phillips dated 1 November 1968. The suggestion was enthusiastically taken up by Mr. R.J. Labuschagne, Deputy Director of the National Parks Board of South Africa in a memorandum of early 1969, with particular emphasis on the tourist recreation possibilities. The Oxbow area of the Malibamatso catchment had also been suggested as a possible National Park in 1968 but Sehlabathebe was selected following a site meeting there in 1969.

As has been pointed out in 4.1. the Sehlabathebe National Park was therefore brought into existence in 1970 by Government Notice No 34 and under Game Preservation Proclamation No 33 of 1951, although the words "National Park" do not appear in the original legislation. This means that Sehlabathebe has never legally been a National Park although popularly regarded as one. Although legal authority for the Game Preservation Proclamation rests with the Ministry of Agriculture, the functional responsibility for Sehlabathebe has been passed around and is currently handled by Rural Development (see 4.4).

There was considerable emphasis in early memoranda by Mr. A.M. Brynard, successor to Mr. Labuschagne, and subsequently appointed Advisor to the Lesotho Government on National Parks, on the need to develop revenue-earning projects within the Park with a view to its being eventually self-supporting financially. Brynard's Five Year Development Plan for the Park followed this up with specific suggestions for a 150-bed Rest Camp with shops, dams for trout fishing, construction of gravel roads and possibly a golf course. This early emphasis on tourist development led to some hasty and extremely ill-advised work (most of it completely unauthorised) on roads and dams, detailed in 5.2., and there is a long memorandum by Mr. Georg van der Goltz dated 22 January 1973 addressed to the Permanent Secretary of the Ministry of Agriculture deploring interference with the rock pools, blockage of the Tsoelikana River and the induced erosion as a result of dam construction.

A perimeter fence, 40 km in length and financed by World Wildlife Fund, was erected between late 1971 and early 1974. The A-frame building housing the Field Research Station was erected about the time the fence was begun, with financial assistance from WWF and the US Self Help Assistance Programme. Since 1973 an inter-departmental coordinating committee has met at irregular intervals to exchange information and provide policy guidance on Sehlabathebe matters. In June 1974, a Peace Corps Volunteer, Mr. P.O. Cookingham took up duties as Park Administrator and Planner. He was joined two years later by Mr. A.D. Turowski with the same terms of reference and duties.

A Report by Professor John Phillips entitled Ecological Management of the Lesotho National Park, produced as part of a more comprehensive report on the Concept of Woodlot Establishment in Lesotho, took a "manipulatory" approach to the problems of management at Sehlabathebe. Amongst other

things Professor Phillips recommended a programme of periodic veld burning, possible reintroduction of domestic animals and re-establishment of certain native shrubs. Such an approach was not favoured by Mr. Albert Mongi of UNEP in his Report of 1975 (to which the Phillips Report is annexed). He writes "... the habitat manipulatory recommendations must not be adopted if naturalness and avoidance of artificiality is the object of management" . Unfortunately, it is rather late to recommend complete naturalness at Sehlabathebe.

A soil survey of the Park was completed by Conservation Division in 1976 and a check-list of plant species is now well under way. The two Peace Corps botanists engaged on plant taxonomy are also carrying out intensive studies on individual species and on the effect of clipping and burning small grassland plots. A Peace Corps entomologist has also been engaged in collecting and listing a wide range of terrestrial and aquatic invertebrates and two other Volunteers working for the Fisheries Section have been carrying out studies of the endemic minnow Oreodaimon quathlambae.

Visitor access to the Park has been encouraged from the start and tourist accommodation at the Prime Minister's Lodge has been widely advertised. Such a policy, while the Park is still not fully operational and staffed, has led to the diversion of staff from other duties and to still further delays in the Park's proper organization.

5.2. Survey Of Environmental Resources

The area that has been set aside as a National Park (6,805 ha, or c. 25 sq. miles) consists essentially of species -rich high veld ranging from around 2,200 m to about 2,600 m above sea level. It therefore comes entirely within what is generally regarded as the subalpine zone of southern Africa (1,829 - 2,865 m a.s.l.) Besides the subalpine grasslands there are patches of wet meadow and marshland at all altitudes and small areas of dwarf shrub heaths on steep and rocky ground which have been badly damaged by past burning. Aquatic vegetation is well represented in the Tsoelikana River and its oxbow lakes, in rock pools produced by differential weathering of the Cave Sandstone and in shallow, ephemeral pans. There are scattered tall shrubs of Polemannia montana, Rubus ludwigii, Rhus spp. , Leucosidea sericea, Euryops spp. and Helichrysum spp. on cliff ledges, rocky ground and other places protected from fire and browsing animals. However, these form actual open scrub only on one or two high ledges on Thaba Ntso outside the present perimeter fence. Only two small plants of a Protea sp. survive within the fence although Protea savanna grassland is not far off on the Republic side.

The contact of the Cave Sandstone with the Drakensberg Basalts lies here at 2,380 m a.s.l., which is considerably higher than elsewhere in Lesotho. This is probably responsible for the greater exposure of the rock and its fantastic weathering into caves, pillars, arches and potholes. Areas of the sandstone that have long been subjected to sub - aerial weathering exhibit a surface pattern resembling that seen in limestones and other highly calcareous rocks although the sandstones do not actually appear to be calcareous. On the other hand, rock sheets recently laid bare by soil stripping have a smooth appearance

and lighter weathering tints which should enable some estimate to be made of soil loss within the period of pastoral colonisation. The discovery of an undescribed species of Aponogeton within one of the rock pool areas in 1970 lends further interest to the aquatic vegetation of these remarkable weathering features.

The greater part of the fenced area consists of the headwaters of the Tsoelikana but a small section within the entrance gate and around the Research Centre and present Food Aid Store drains to the Leqooa River.

Although the area is said never to have been permanently settled and appears to have been used mainly as seasonal grazing, which was conserved to a greater extent than most comparable areas of high veld on either sandstone or basalt, nevertheless, incised cattle tracks, kraals and built up cave shelters are scattered widely around and there are some indications that attempts at cultivation have been made. In one or two places these attempts at cultivation have led to locally severe erosion. Except in the vicinity of the kraals, where the local flora has largely been replaced by alien "weeds", the grasslands have probably been little affected by grazing and have remained exceptionally rich in species but tall shrub communities have been virtually eliminated here as elsewhere in Lesotho and dwarf shrub heaths have been badly damaged and reduced in extent by burning.

Probably because it has been a less densely populated pocket of country with fine grazing lying adjacent to State land in the Republic of South Africa, Sehlabathebe has never entirely lost a small resident population of vaal rhebok and has continued to be visited by other species of antelope from time to time. Other animals from porcupine to oribi, or at least indications of their presence, are seen occasionally but the fauna of the area is less well known than the flora on the whole.

Unfortunately for the overall quality of Sehlabathebe as a Mature Reserve, certain "unofficial" and premature work designed to further the tourist attractions of the area in the R.S.A. National Park tradition was undertaken during a period of administrative confusion in the early days. This consisted of:

- a. Construction of a chain of four dams close to the Prime Minister's Lodge on the headwaters of one branch of the Tsoelikana and the stocking of these with rainbow trout.
- b. Construction of various dams scattered around the headwaters of other branches of the river, including the rock pool area, together with the enlargement of certain natural pans and other interference with the natural drainage by means of heavy earth-moving equipment. The dams were constructed partly of organic topsoil so that a few have broken and initiated downstream gullying. The borrow areas have remained largely uncolonised and are subject to erosion.
- c. An attempt to construct a rock dam across the main Tsoelikana to flood a large area of the river flats with its oxbow complex. This fortunately failed and the only damage done has been the partial blocking of the river bed with rock rubble.

- d. Excavation of certain deep, soil-filled potholes in the sandstone near the Park entrance in an effort to reconstitute the holes as swimming pools. Aponogeton ranunculiflorus does not occur in this area of the Park now but an examination of the discarded deposits for fossil seeds of the species might have thrown some light on its history as well as the vegetation history of the Park as a whole. Unless similar infilled potholes can be found elsewhere it seems that a valuable research tool has gone for good.
- e. Construction of a network of jeep tracks throughout the Park. Part of this was carried out in connection with the fencing programme between 1972 and 1974 and with an eye to later fire protection and tourist movements. These tracks have not been maintained and are scouring badly in places.

The net result of the above work has been a substantial increase in the local soil erosion, with increased siltation of the river. It is impossible to separate the effects from erosion and siltation already occurring as a result of the late pastoral use of the catchment but they must constitute an additional threat to the local population of the endemic minnow, Oreodaimon quathlambae as well as to the health of the entire river ecosystem. For its size, the Tsoelikana has an exceptionally turbid flow at low water levels and an exceptionally heavy silt and clay deposit in all the pools, with a clay coating on stones in all areas of slack water. This may be due fundamentally to the occurrence of readily erodible grey mudstones and shales of the Molteno Beds at such a high altitude within the river system and it must give cause for concern.

The conclusion reached is that despite past grazing and burning, scrub removal and game destruction, and despite later direct interference with the drainage system, Sehlabathebe still ranks high as a Nature Reserve of international quality. Furthermore, there is considerable scope for encouraging the return of certain animal species that have been lost or greatly reduced in numbers and for the re-establishment of scrub communities on a small scale. The recent damage by earth-moving machinery illustrates cogently the danger of further attempts to gild the lily for tourism within the Park itself. There is, however, no reason why tourists should not be catered for in an adjacent area and allowed reasonably free access to the Park on foot and on horseback. If the major part of the Park is to be redesignated as a Nature Reserve, as is now recommended, it would be inappropriate to continue the use of the Lodge as luxury tourist accommodation. The Lodge would, however, make an excellent National Park Centre either for Sehlabathebe alone or for the greater Lesotho National Park recommended below (6.3), housing administration, a museum and interpretive display. The existing hostel could be adapted to accommodate school parties.

A further minor point is that continued use of the rather pretentious term "Research Centre" for the laboratory and living accommodation near the Park entrance leads to some misunderstanding of its function and facilities. The building is, in fact, a "Field Research Station" in accepted terminology. It is unfortunate that the A-frame method of construction has been used here instead of a more traditional style which would have blended better with the background.

5.3. Alternative Strategies For Sehlabathebe

A Management Plan for the Sehlabathebe National Park can be worked out in detail only in the light of alternative strategies available for the area in its proper context of Lesotho environmental conservation. Much will also depend on the form of implementation of the proposed road from Bushman's Nek in the Republic.

- 5.3.1. The area is considered as a Managed Nature Reserve (sensu I.U.C.N.) with the boundary more or less as at present and forming part of a greater Lesotho National Park embracing the "Drakensberg Ridge" or Eastern Escarpment Wilderness Area with surrounding buffer zone.
- 5.3.2. The area is visualised as a separate National Park as at present, in which case there would have to be a tourist development zone demarcated in the present entrance area (Leqooa catchment) with the remainder (Tsoelikana catchment) treated as a Managed Nature Reserve.
- 5.3.3. It is not yet entirely certain that the present plan for a new vehicular road into Lesotho from Bushman's Nek will be implemented. If the plan goes through the following options will be available and these are set down in order of desirability from the point of view of Sehlabathebe as a Nature Reserve or zoned National Park :
 - a. The road bypasses Sehlabathebe by using Ngangwana Pass and the upper Thamatu Valley to service any tourist facilities within or adjacent to the Park by way of a spur road from the Leqooa Valley.
 - b. Sehlabathebe has to cope with an upgraded road to the border at Ngoangoana Gate. Since the existing track through the Park would then be unable to carry satisfactorily the increased traffic Lesotho would have to construct a new road of comparable standard to link up with the present Leqooa Valley road :
 - (i) making the Port of Entry at Old Ngoangoana Gate and moving the present Police Post back to its old site, thus avoiding an extra 5 km or so round "The Crater" . Avoiding the difficult section of steep grades from the buttress of Thaba Ntso to the present Park gate by using a shorter route through the Park with an exit by Thamathu Pass.
 - (ii) entry at Old Ngoangoana Gate and following the present alignment through the Park.
 - (iii) entry at Ngoangoana Gate and entire alignment as at present.

In principle it is considered that the shortest possible distance through the Park should be chosen, if such a road is inevitable, and that the existing alignment would be preferable to upgrading any of the subsidiary jeep tracks, whether central or on the perimeter, and leaving the present track via the

Lodge as at present. A tourist development zone in the Leqooa catchment of the Park would make any disturbance resulting from a new road down the steep face of Thaba Ntso of less importance to the Park as a whole.

5.4. Basic Principles And Aims Of Management

In spite of past interference by pastoral activity, earth-moving machinery and various structural works, the Sehlabathebe area still has important scientific features which would be endangered further by its management in toto as a National Park in the R.S.A. tradition. Premature preparations with such a future in mind have already obscured or damaged (to some small extent irreparably) certain of these features. Since modification of the ecosystems through grazing, burning, induced soil erosion and direct destruction of animal life have been going on for some time, Sehlabathebe is now unsuitable for consideration as a "Strict Nature Reserve" but should be designated and treated as a "Managed" Reserve.

- 5.4.1. The area should be set aside for the conservation in perpetuity of what may be the best surviving example of species-rich subalpine grassland (high veld) in Lesotho - and perhaps in southern Africa. There are associated and subsidiary types of subalpine heath, marshland and aquatic vegetation. In addition the area exhibits interesting and important land forms associated with sub-aerial weathering of the Cave Sandstone which here makes its contact with the basalt at a greater elevation than elsewhere in the sub-continent.
- 5.4.2. Protection should be ensured of certain rare and/or endemic plant species belonging to the Lesotho subalpine environment, such as Aponogeton ranunculiflorus, and of all other plant species present (including mosses, hepatics, lichens, fungi and algae).
- 5.4.3. Encouragement should be given within the area to the recovery of dwindling stocks of high veld game animals, such as vaal rhebok, and protection should be extended to all animals (including birds, reptiles and insects) associated with the subalpine and high veld habitats.
- 5.4.4. Particular protection must be extended to what is probably a substantial part of the presently known stock of the rare and endemic minnow Oreodaimon quathlambae.
- 5.4.5. Within the area of the Reserve, conservation is to be extended to all rock, soil and other natural features and to all historical and cultural artefacts.
- 5.4.6. The area will require to be actively managed with the above ends in view.
- 5.4.7. Unlimited access to visitors should normally be allowed insofar as this is consistent with the above objectives. Any permanent and localised exceptions will be set out in the Management Plan and temporary closures for research or other purposes may be decided on a day-to-day basis.

- 5.4.8. Scientific research carried out within the Reserve should be directed primarily towards the practical matters of environmental management and secondarily towards a general understanding of climatic, geomorphological and pedological processes and the ecology of individual plant and animal species and their communities.

5.5. Outline Management Plan

- 5.5.1. A decision will have to be taken at an early stage as to whether the entire area (or the Nature Reserve portion if the Park is zoned) is to be regarded as a closed or open system for the management of the larger animals. If the system is to be closed the fence must be completed along the escarpment edge and running repairs scrupulously carried out; if it is to be an open system a second decision is needed as to whether the escarpment fence should be removed or completed with inclusion of an adequate number of 2 m wide cattle grids to allow entry and egress of game animals.

The existing fence line along the southwest face of Thaba Ntso is completely unsatisfactory. Stock tracks are now concentrating above the fence and exacerbating soil erosion. This in turn affects both the fence itself, which is also subject to damage from natural rock falls, and the vegetation of the Park within the fence. The unfenced face of the mountain also acts as a stock trap in severe winter weather. A substantial portion of this part of Thaba Ntso, which lies partly in the Leqooa and partly in the Tsoelikana drainage, is in any case useless as grazing or is inaccessible to stock.

On the other hand, the southwest-facing slope of the ridge separating the Park from Sehlabathebe village, although within the fence, adds little to the value of the Park and needless friction is thereby caused with the local people who are deprived of the grazing.

Other sections of the fence are also particularly badly aligned, such as that from the "Old Gap" to the Tsoelikana crossing. A detailed description of an improved and more rational fence alignment has been prepared by Mr. P.O. Cookingham, Park Administrator, and this is the one now recommended.

- 5.5.2. It is probable that a regime of rotational burning will be required in some areas of the Park. This becomes necessary in order to avoid the build up of large quantities of plant litter which tends to smother some of the smaller plant species and also provides a dangerous quantity of fuel for accidental fires. Burned patches and strips should be kept small and should not include steep slopes and ridges or any relict communities of dwarf shrubs which should rather be encouraged to recover from the damage inflicted by past burning. There has been little invasion of the grassland here by "Karco" shrubs such as Chrysocoma tenuifolia and there is therefore no necessity for controlling them by veld burning as has been suggested. Results obtained from elsewhere cannot be applied uncritically to the situation at Sehlabathebe so that experimental burnings larger than the existing

botanical clipping and burning plots(5.1) will first be required. It has often been suggested that floristic diversity of the veld can only be maintained by a regime of animal grazing (wild or domestic) and/or burning but this is by no means certain. It may be so on restricted areas with coarse dominants but it is probably untrue when applied to an area of some vegetational diversity such as Sehiabathebe.

- 5.5.3. While there is no fundamental scientific reason why domestic stock grazing should not be allowed on certain sections of the Park at certain times of year as an alternative or ancillary to grass burning, any opening of the Park to local graziers is quite out of the question in view of the complications involving herd boys and their dogs that this would entail. Carefully controlled grazing by Government owned stock such as horses would be a permissible solution but is probably inadvisable on grounds of public relations.
- 5.5.4. As an alternative to burning and grazing, some form of grass cropping could be considered in suitable areas. If the soil conservation work suggested in 5.5.9. below is undertaken, seed-bearing wild hay will be required in large quantities as a mulch for the bare ground. Less mature hay could also be cut as a winter feed for Park horses and even distributed to surrounding villagers when there is a surplus. Many areas of the Park are level enough to allow some form of mechanical harvesting.
- 5.5.5. There would appear to be no good reason why the reintroduction of game animals appropriate to the habitat, and thought to have been present in the recent past, should not be undertaken on a small and experimental scale. This would depend, however, upon a decision having been made in favour of a closed system of management since many of the appropriate species would doubtless still prefer to winter in the milder valleys at lower altitude to the east, even in the presence of adequate winter fodder. With an open system it would be preferable simply to encourage a natural build up in numbers of the resident rhebok and volunteer immigration of other species from outside the Park. The situation would be different should a fenced Park or Game Reserve be established by the Republic in either the Natal forestry ground or Cape private farms adjacent to Sehlabathebe. There are indications that some arrangement could then be made whereby animals migrating from Sehlabathebe would be free to migrate back only to the Park with summer and winter range on opposite sides of the border.
- 5.5.6. It is conceivable that in the long term numbers of game animals at Sehlabathebe would build up to a point where reduction would be advisable in the interest of the Park vegetation. In the absence of predators this would have to be carried out by annual culling by Park staff based on detailed knowledge of the population dynamics of the various species. The meat could easily be very profitably disposed of in Maseru.

- 5.5.7. In the same way there should be no objection to the reintroduction, on an experimental scale, of plants thought to have been lost to the Park area within recent times. In practice this amounts to certain species of shrubs such as Protea that were probably present in the form of open shrub savanna or such as Leucosidea sericea which would at least have formed local thickets or scrub woodland. A small nursery for the rearing of transplants should be started and a careful record kept of all experimental localities and results achieved.
- 5.5.8. There should be no further road and track construction within the Nature Reserve area. Efforts in this direction should be concentrated on improvement of the vital road sections between entrance and Lodge and on counter-erosion work along certain sections of the defunct tracks.
- 5.5.9. Soil conservation and counter-erosion work is required on certain sections of the old and incised cattle tracks, abandoned roadways and the gullied areas of past attempts at cultivation. This is particularly necessary where sediment is being discharged directly into the streams; where sediment is now being trapped and filtered by wide areas of restored grassland the source areas could be left to the slow repair of natural plant colonisation. The most appropriate counter-erosion work in the circumstances is to avoid further mechanical disturbance and merely cover the bare surfaces with a natural hay mulch held in place by netting and pegging or by bitumen emulsion spray. Where the resources are available, a complete prescription of levelling, top-soiling, gully plugging, seeding or planting and fertilisation could of course be applied but seems hardly necessary in most places, at least to begin with.
- 5.5.10. Had the trout dams at the Lodge been safely constructed, or if they could still be rendered completely safe without dismantling and starting over again, there is no reason why they should not form part of the Park or Nature Reserve scene. As they stand, however, they are a constant threat to the health of the entire downstream environment, which is already giving cause for anxiety, and to the continued existence of the Oreodaimon population below the waterfall. It seems best therefore that they should be drained and the area landscaped and planted with indigenous species. The shallow dams downstream from the Lodge are of greater interest to waterfowl and wading birds and do not pose a threat to the river. They should be retained. No further dam work or interference with natural rock pools, pans or drainage lines should take place. Existing bare earthworks should be treated under 5.5.9.
- 5.5.11. There should be no further trout stocking of dams, pools or river. The river population lacks spawning grounds and already consists of a small number of large fish which should die out or be fished out in due course.

- 5.5.12. The present botanical, entomological and more sporadic surveys of other groups should be consolidated by carrying out a complete base-line survey of all plant and animal life in the area and relating this to existing geological and soil surveys. Management should be directed fundamentally to maintaining maximum diversity of indigenous species. The few exotic weeds present need not be actively destroyed; they will not spread and can be expected to diminish in a properly managed Reserve.
- 5.5.13. As more staff become available it is recommended that the climatological station be moved from the present site to one near the Lodge which will be more representative of the Park as a whole. Records of potential evapotranspiration could replace or supplement the existing open pan evaporation as this would be more meaningful from the vegetation point of view. A sunshine recorder is also required.
- 5.5.14. The Reserve Management Plan should be regularly up-dated on the basis of research results. A loose-leaf Reserve Record Book should be kept, containing a copy of the Management Plan and a record of all work carried out by resident staff and visitors, either in typescript or in the form of published reprints.

6. PROPOSED LESOTHO NATIONAL PARK

6.1. Original Proposal As Drakensberg Ridge National Park

As conceived in the ARC Development Plan this would have consisted of a belt, some 80 by 1.6 - 4.8 km (50 by 1-3 miles) in width, running along the watershed of the Drakensberg escarpment at over 10,000 ft a.s.l. (3075 m) and stretching from Mont aux Sources in the north to Sani Top in the south. This belt was described by the consultants as "having no regular usage at present" . A vehicular road entirely for tourist use was also proposed and visualised as running close to the watershed with about eight clusters of ranger and visitor accommodation situated about 16 km (10 mile?) apart and to the west of the demarcated belt.

In a Report to the Lesotho Government by Mr. Albert Mongi (UNEP) in 1975, a slightly larger "Wilderness Area" is proposed, extending from Machachanong, northwest of Mont aux Sources, to Ngoangoana Gate at Sehlabathebe.

6.2. Survey Of Environmental Resources

In the course of the present survey the alpine terrain and vegetation of the proposed area were examined along two traverses from Mahlesela Hill to a point on the escarpment near Mont aux Sources (16 km) and from Black Mountain Pass to the summit of Thabana Ntlenyana (11 km). In addition, the alpine and subalpine vegetation in the vicinity of Sani Top and Oxbow were examined on foot, with vehicular traverses of Black Mountain Pass and from Moteng Pass to Mokhotlong. Observations were compared with the floristic and phytosociological account given by Killick (1963) for the Cathedral Peak area of the Natal Drakensberg.

In comparison with other alpine areas of both hemispheres the Lesotho alpine vegetation lacks variety and physiognomic differentiation. This is due to the restricted altitudinal range involved, the uniformity of rock and soil types, the absence of permanent and semi-permanent snow beds and to some extent the lack of differentiation of a distinctive alpine flora. In addition there has been universal and relatively intensive maltreatment by grazing and burning which has accentuated the fundamental uniformity. All shrub communities have suffered severely through burning and selective browsing of palatable species, some being converted to herbaceous communities and others drastically altered in composition. By comparison the herbaceous communities such as the grassland types have suffered less modification, except for the tussock grasslands which have often been completely killed by fire and replaced by bare stony soil or pioneer, "weedy" species. The herb and sedge-rich swards of the spring bogs have probably been modified to a greater extent than the dry grasslands and feldmarks. Contrary to what has been said in other accounts, there are no raised bogs and comparatively little real peat. The effect of different land usage on either side of the inter-

national border has been such that it is often difficult to recognise on the Lesotho side the plant communities described by Killick from the Natal Drakensberg. The recent account of some alpine vegetation types from 30 km northwest of Mokhotlong by Van Zinderen Bakker & Werger (1974) is more immediately relevant.

Two floristic and phytosociological directions of variation can be discerned, one from north to south, the other at right angles to the escarpment. For example, the predominant vegetation type in the Thabana Ntlenyana area is a grass - Compositae feldmark, with abundant Merxmuellera tussock grassland but little sward grassland or dwarf shrub heath. No influence of snow redistribution by wind could be distinguished in the vegetation composition here. In the Mont aux Sources to Mahlasela Hill area on the other hand the predominant vegetation is a sward grassland showing differences in species composition and physiognomy according to winter snow depth and persistence, with subordinate Helichrysum scrub along the exposed ridge crests and some ericoid dwarf shrub heath in boulder-strewn areas. There is little Merxmuellera tussock along the drainage lines and some grass-Compositae feldmark in passes and on the most exposed ridges. In contrast Killick could find very little variation in the vegetation he examined on a summit walk from Organ Pipes Pass to Mont aux Sources.

Again, many alpine and subalpine species are confined to the eastern slopes of the escarpment or extend only a short distance to the west of the watershed. This is probably a natural feature accentuated by land use differences.

Despite what has been said above regarding a certain lack of variety, the vegetation of the zone is eminently worthy of conservation both from the scientific point of view and, in particular, because of its protective function in water supplies. It has also a direct, although small, commercial value as summer grazing for domestic stock.

6.3. The Present Proposal

The National Park concept embodied in the original proposal is not appropriate to this area as an independent entity and the extremely narrow belt suggested as a wilderness area would be difficult to manage even if buffered in places by "conservation areas". On the other hand a wider belt would perhaps be viable if buffered by a continuous conservation "zone". From this hypothesis, and from the concept of Sehlabathebe as a Nature Reserve rather than as a National Park, has grown the idea of a single large Lesotho National Park incorporating Sehlabathebe (see Fig.1 &2), an Eastern Escarpment Wilderness Area and perhaps part of the Orange River Gorges (see 7.3) as Nature Reserves, and buffered by a continuous conservation zone in which land use would continue as at present but in which there would at last be strict application of controls already available, for example, under the Land Husbandry Act of 1969 (4.1).

FIGURE 1 PROPOSED LESOTHO

NATIONAL PARK (schematic)



A width of 10 km has been regarded as a desirable minimum for the Wilderness Area except where villages and main traffic routes come within this distance of the border. Where possible the width can be increased to incorporate high plateaux. A corridor should be left along the road from Sani Top to Black Mountain Pass, thus dividing the Wilderness Area into north and south sections. In the extreme north the road and power line serving the Letseng Diamond Mine make a convenient western boundary and there seems little point in forming a second corridor here as the excluded section of the high northern plateau contains little that is not also found to the east of the road. With these exceptions the boundary can be taken approximately along the 3,000 m contour. The boundary of the proposed Wilderness Area thus appears roughly as shown in Figure 1. Precise boundaries need not be delineated on a larger scale at present; such an exercise would mean little until a ground survey is ready to demarcate the line by boundary pillars. An area of this nature is going to be particularly difficult to define either on a map or on the ground by means of natural and easily recognisable features alone.

The proposed Wilderness Area should be kept free from all developments such as roads, buildings and dams. The construction of the tourist road recommended in the ARC Report would be disastrous environmentally as well as extremely expensive to construct to a standard adequate to ensure complete absence of induced soil erosion. Access to a scenic point on the escarpment is already provided at Sani Top and in due course a spur road from Letseng to the northern escarpment edge could perhaps be provided along the alignment of the track which already exists to Lekhalola-Namahali Pass north of Mont aux Sources. In place of the vehicular road there could be a wilderness trail for foot traffic and pack animals marked by painted stones for safety reasons. Small overnight shelters could be built in a style to blend with the landscape at 15 - 20 km intervals. There would also have to be some form of Ranger Posts at the same localities. The trail could eventually be extended from Sehlabathebe to Oxbow.

Vegetation burning and the cutting of shrubs could not be permitted within the Wilderness Area but some grazing of domestic stock could continue at least for an experimental period and subject to the proviso that overnight kraaling would not be allowed. Fodder production by the vegetation of this area is so low that little would be lost by such an embargo. The cooperation of the local chiefs would of course be necessary.

For proper management, the Wilderness Area would require to be flanked by a buffer zone to the west which would still form part of the National Park. In deciding boundaries for this the Conservation Areas of ARC Consultants have been taken as a basis and fused to form a continuous zone from Oxbow to Sehlabathebe and the Senqu Gorge Reserves. All development of tourist facilities in the Park would take place within this zone and thus be subject to the appropriate environmental safeguards. Also within this zone there would be controls over burning, grazing and cultivation, wildlife destruction, roads, mining activities and buildings as proposed by ARC. The zone would be an

appropriate area for implementation of Ministry of Agriculture schemes of grazing control and group ranching. The principal tourist centres would probably be at Sehlabathebe, Oxbow, Mokhotlong and Sani Top, as envisaged at present, and the gradual introduction of zonal control proposed should begin there.

The ARC Consultants have also proposed a multi-disciplinary Mountain Authority charged with all conservation responsibilities to determine the total use of resources within a defined area of the Lesotho mountains, starting as a pilot project at Mokhotlong. The idea of the Authority would be to overcome present difficulties of coordination between different Ministries and Departments in the field pending the formation of a Ministry of the Environment. A similar scheme has much to commend it in connection with the Lesotho National Park now proposed. In any event the National Parks and Reserves Organization would hardly be large enough to undertake supervision of the large Conservation Zone and would naturally be dependent on the cooperation of Soil Conservation, Fisheries, and many other Divisions and Departments. The Authority would be designated Lesotho National Park Authority and would consist of Parks and Reserves, Agriculture, Interior, Tourism and Rural Development. The Wilderness Area would have the status of a Nature Reserve and as such would be run by a special Management Committee of the National Parks and Reserves Board of Trustees. Such an Authority might indeed be preferable to a separate Ministry of the Environment which would be so comprehensive in its county-wide coverage as to be largely meaningless and unwieldy in its overlap with other Ministries.

In the event of such a Lesotho National Park scheme being regarded as too ambitious, and Sehlabathebe developed as a separate zoned National Park, the viability of a separate Eastern Escarpment Nature Reserve is doubtful. It might however still be workable if offered by at least separate conservation areas around Oxbow, Mokhotlong and Sani Top to be operated by some form of Ministerial consortium. In this case there should also be a conservation area to buffer Sehlabathebe.

7. OTHER MAJOR RESERVE PROPOSALS

7.1. Proposed Ongeluk's Nek National Park

This area (Fig. 2) has been proposed as a National Park by the local District Authority and in part has been examined and supported by ARC Consultants. There are at present grazing control areas within the proposal but resources are described as inadequate for full control to be established. The original proposal embraced the valley of the upper Quthing River between the Lesotho border and the Likhaebaneng River. An area six or seven times this size, and delimited by the peaks of Mapuleng, Thaba Putsoa and Tsatsane and the village of Ha Bolese, was later suggested as an associated Game Reserve. The large area encloses fourteen villages, with 804 people and an uncertain number of domestic animals.

These proposals cannot be supported by the present consultant. The area has no really outstanding scenic attraction, there are no game animals left so far as can be ascertained and vegetational importance is minimal. In addition there would be great difficulties involved in fencing to allow the introduction of big game and in the resettling of so many people. The only feature of the area meriting serious attention is the small artificial lake that has been created at over 2,400 m a.s.l. on the headwaters of the upper Quthing by means of a short concrete dam at the point where the main stream formerly cut sharply through a ridge to the southwest to join the Likhaebaneng. The dam is now leaking badly on the flanks and scouring its central foundations during high stream flow. When at its maximum retention level, this lake is probably the largest static water body in Lesotho and is proving to be of considerable attraction to wading birds and waterfowl. At present (December 1976) the water area is about the same as that of Tsa Kholo Lake.

When the lake was inspected in the early morning of 21 December 1976 more than a dozen species of water birds were counted, some species being present in considerable numbers. These included black and white storks, Egyptian geese, teal, bald ibis, Cape shelduck, yellow billed duck and spoonbills. The lake has been suggested as suitable for recreational use and has been stocked with trout. However, it is shallow, cold and permanently muddy and would not therefore be attractive for sailing, swimming and waterskiing. It has also been suggested that these disadvantages could be partly overcome by enlarging the dam and raising water level. While there is certainly considerable scope for this, the resulting larger and deeper lake would be much less attractive to many birds since the wet, grassy and marshy flats at present used as feeding grounds would be permanently inundated.

The lake and the valley flats could with little expenditure be made into a valuable Nature Reserve or Bird Sanctuary, especially if reeds and other indigenous marsh plants were introduced to provide the cover now lacking.

SUGGESTED NOMENCLATURE OF PARKS AND RESERVES

(see Figure 2)

1. Lesotho National Park
 - (i) Sehlabathebe Nature Reserve
 - (ii) Eastern Escarpment Wilderness Area
 - (iii) Senqu Gorges Nature Reserves
 - (iv) Conservation Zone
2. Qeme Plateau Game Park
3. Ongeluk's Lake Nature Reserve (Bird Sanctuary)
4. Tsa Kholo Lake Nature Reserve (Bird Sanctuary)
5. Maphotong Gorge Nature Reserve
6. Lower Quthing Valley Nature Reserve (temporary title)
7. Upper Makhaleng Valley Nature Reserve (temporary title)

FIGURE 2 PRINCIPAL LESOTHO NATIONAL PARKS AND RESERVES

AS PROPOSED
(Schematic)



An area of some 700 ha would be involved and could eventually be fenced although it would not be immediately necessary to exclude domestic stock. The surrounding hill slopes and the entire National Park proposal as a whole are probably more suited to an agricultural grazing control scheme, such as the Group Ranching Unit suggested by Dr. Maxwell at a meeting held by Agriculture (Livestock Division) in 1976 to consider range work in Lesotho, than it is for a National Park.

7.2. Proposed Qeme Plateau National Park

The Qeme Plateau, which lies immediately south of Maseru, is said to be one of the few plateaux in the lowlands of Lesotho which has never been cultivated and has only relatively recently been utilised for the grazing of domestic stock in significant numbers. It has been suggested in the ARC Report as lending itself to the development of a small scenic and faunal Park of sufficient size to be properly described as a National Park. The plateau lies at some 2,000 m a.s.l. and has an area of just under 4,000 ha.

Like Sehlabathebe, this is grassland and marshland habitat with small patches of dwarf shrub communities and scattered larger shrubs in rocky places. The veld types are lowland rather than subalpine but they are again reasonably species-rich in comparison with most of the over-utilised lowland grasslands of the country.

The plateau has three lobes : the largest southeast lobe having axial drainage which forms the most reliably perennial stream, as well as some lesser streams draining off to the southwest; the intermediate northwest lobe has basically radial drainage with short ephemeral streams, and the smallest southwest lobe has virtually no surface water. At the time of inspection in late November, 1976, there were at least six large water-holding pans on the two main lobes of the plateau.

Soils are generally sandy and shallow although they do reach 1.5 m in depth along the main stream. Sheet erosion and gullying have both begun in spite of the short history of intensive use.

The grassland is short and dominated by Elyonurus argenteus, Eragrostis capensis, and other species, with Themeda triandra apparently absent or rare. Cyperaceae are everywhere abundant and form marsh communities in places. The ephemeral pans contain aquatic vegetation of Crassula, Marsilia, Limosella, etc. There is also an interesting area of dense scrub below the cliffs where the main stream debouches from the plateau. At its downstream end this appears to be protected against the penetration of domestic animals by large fallen rocks and at the upstream end it is surrounded by high sandstone cliffs. Shrub and tree species could not be identified. Similar scrub may exist in other protected niches around the plateau.

The main stream rises in a series of Scirpus and Eleocharis flats but quickly becomes incised and gullied. Bank cutting and piping of the adjacent slopes

are both active at the downstream end but some of the tributaries still have a slow and meandering water flow through intact marsh vegetation which acts as a waterspreading system in time of flood. Rain splash (sheet wash) erosion is active over most of the plateau wherever vegetation cover drops appreciably below 75%. Cover is less than 50% in places on the shallower and very sandy soils. A little sand blowing and drifting occurs.

Animal life seen on the same day included yellow-billed ducks and coots on the pans, francolin, storks, dassies, frogs, toads and small rodents not identified. The plateau thus appears ideally suited for the scheme proposed in the ARC Report with the following reservations :

- a. Water resources do not appear to be sufficient for trout fishing development on anything other than a modest scale. Some trout dams on the lower reaches of the central stream would assist erosion control.
- b. There is little scrub on the summit or on the flanks of the plateau. Vegetationally important areas of relict scrub, such as that described above, could be damaged by browsing animals such as eland and kudu and it is recommended that these species should be omitted from the list of game animal introductions.

The whole operation would require most careful management of both animals and range and this should involve botanical monitoring, with grazing exclosures, and a careful watch on the level of soil erosion. The best areas of indigenous scrub should be completely protected. The shape of the plateau lends itself to some simple system of rotational grazing.

The plateau ecosystem is fragile and it would be most inadvisable to proceed with the recreational scheme envisaged in the Second Five Year Plan Vol.1, page 138. Even the simple overnight accommodation for visitors proposed in the ARC Report is hardly necessary and if proceeded with it should be peripheral rather than central. There could be problems with water supply and sewage disposal among other things. In particular it must be emphasised that the plateau is of Nature Reserve quality from the vegetational point of view as well as offering opportunities for the introduction of game animals. As a faunal and vegetational Nature Reserve it must be under the direct control of the Parks and Reserves Board of Trustees and not Lesotho Tourist Corporation in any capacity as has been suggested. In view of the fact that all game animals would have to be introduced, the title Game Park is regarded as more suitable than Nature Reserve or Game Reserve.

Some of the proposed tourist developments at Qeme, now regarded as incompatible with its status as a Nature Reserve, could perhaps be accommodated in another project being considered under the aegis of Interior (Parks & Gardens) in Maseru. This is the Maseru City Park Project (Project Developer Mr. Raymond Wall) which would also involve some animal management in near natural surroundings. The two projects would be entirely complementary.

7.3. Proposed Orange River Gorges National Park

The ARC Consultants suggested in their report that the main and tributary gorges of the Orange or Senqu River, starting about five miles downstream from Sehonghong and ending at the confluence of the Sejabatho River, are worthy of National Park status for the following reasons :

- (i) Spectacular scenery
- (ii) Relict populations of Vaal Rhebok and possibly Klipspringer
- (iii) Wide range of cliff nesting birds including Lammergeier and Cape Vulture
- (iv) Many rock painting sites

Although rather inaccessible, the gorges are described as sparsely inhabited and it is recognised that development as a full National Park "excluding human rights" would be difficult. The present consultant endorses the opinion that the gorges are of considerable scenic and scientific importance and agrees that a full survey of their resources is necessary.

Since the ARC Report was written, a Food Aid track along the river has been partly completed and, although the track is still liable to damage at high river levels, the area is no longer as inaccessible as it was. This track was traversed in the course of the present survey and some of the deepest gorges downstream from Sekakes were viewed from above. It was noted that all slopes accessible to people and domestic animals were being cultivated or overgrazed and periodically burned. Fires are steadily reducing the representation of indigenous scrub to what is able to survive on high ledges and in rock crevices.

It is therefore suggested that the gorges should be surveyed in due course by the Parks and Reserves organization and that any sections found worthy of Nature Reserve status should be so declared. These could be incorporated in the Lesotho National Park as indicated on the accompanying map overlay. It is not considered that the gorges as a whole could stand as a National Park on their own but separate Reserve might be individually viable.

7.4. New Nature Reserve Proposals

7.4.1. Part of lower Quthing Valley (1 : 50,000 map sheet 3027 BB)

An area between Mt. Morosi and the Mosetlelo gorge has been described by Mr. A.M. Brynard in his Five Year Development Plan for Lesotho National Parks as "about the only well wooded valley in the country".

The new road alignment up the valley was traversed in the course of the present survey but the area was not examined in greater detail to determine its possible value as a Nature Reserve. The area recommended is more

restricted than that described above and extends from the confluence of the Quthing and Senqu to a point about half way to Mosetlelo - about 16 km² in all. Open woodland and patches of scrub woodland and dense scrub occur on both sides of the river, the best groves being those protected by large rocks fallen from the cliffs. Trees of white stinkwood also line the roadside and there are open stands of Aloe ferox with some Cussonia spicata on the slopes. The flora includes cushion Euphorbias and other species not noted elsewhere. There appear to be closures for winter grazing at the present time throughout the valley so that, in view of the abnormally dry season, the fire hazard is considerable. Immediate protection from tree and scrub cutting and fire is required. Grazing enclosure is not so immediately necessary but some areas would benefit from fencing in due course provided protection from the increased hazard of grass fires could be ensured. The area lies at about 1,500 m a.s.l.

7.4.2. Part of upper Makhaleng Valley (1 : 50.000 map sheet BD)

The area now proposed as a woodland and scrub Nature Reserve lies some 5 km up the valley of the Makhaleng River from the bridge on the Mountain Road at an altitude of around 2,100 m. In the centre of the area there is a small oxbow, similar to the well known feature on the upper Malibamatso, surrounded by steep slopes and with several patches of level meadow land. Within the bowl of the hills there are at least six fairly large groves of Leucosidea - Buddleia woodland with trees of L. sericea, B. rugosa and B. salviifolia up to 5 m in height and with trunks of 30 cm diameter at breast height. Shrubs such as Rhus spp. are present and there is also a well developed woodland floor community in places although much of this has been converted to grassy glades by stock grazing. The area also contains an incipient river canyon, several small waterfalls and water slides and a number of large river pools. It is scenically very attractive.

The whole of the surrounding area is particularly rich in relict stands, mostly open, of Leucosidea and Buddleia so that no great hardship would be involved were the local people to be deprived of the use of a small portion of this, scattered shrubs and isolated trees extend throughout the grassy slopes of the proposed Reserve area and also upstream for an unknown distance. The scrub is being progressively reduced by burning and although Leucosidea is able to sprout from the base following cutting or burning, considerable damage is being done to the entire habitat. At higher altitudes within this same catchment there are extensive areas of Passerina-Philippia scrub some of which can be seen from the Mountain Road on the ascent of Blue Mountain Pass. Further investigation might reveal that the whole of the Makhaleng catchment, including the area now proposed, is worthy of Nature Reserve status. Precise boundaries will not therefore be suggested at this stage.

The area surrounding the oxbow is at present subject to day use by pony trekkers from Molimo Nthuse and from the pony camp on the Mountain Road.

8. SMALL SITES CONSIDERED

Among the numerous small sites recommended by ARC in their Report, Maletsunyane Falls and Gorge and the Ketane Falls and Gorge are accepted as potential Nature Reserves of national importance in view of their obvious value as bird breeding localities although they have lost all value as representative vegetational features. The following proposals were visited and reassessed.

8.1. Maphotong Gorge, Roma

The impression obtained here endorses ARC opinion that this small sandstone gorge, with its remnants of natural vegetation and population of breeding birds is of outstanding natural history interest. Unfortunately, the north-facing slope is being regularly burned and any scrub remaining there steadily eliminated. A recent fire has even destroyed shrubs and small trees on the steep upper slopes and inaccessible ledges.

The south-facing slope of the gorge has almost unbroken scrub with scattered trees due to the protection afforded by the river and by large fallen rocks at the village end. The upper slopes immediately under the sandstone cliffs and the steeper spurs below have a stunted scrub community of rather less interest. Damp hollows and the drainage lines carry the largest trees and the densest scrub cover.

Shrub and tree species noted : Buddleia salviifolia, Leacosidea sericea, Celtis africana, Myrsine africana, Ilex mitis, Rhus spp. olive and white stinkwood. The exotic trees Acacia dealbata and Salix babylonica have penetrated along the entire length of the river within the gorge, presumably from the village end, but they have not invaded the slopes themselves.

Grass burning is also being carried out above the cliffs on both sides of the gorge. The Lammergeier nesting site occurs on the largest cliffs which lie on the north-facing or burned side.

After declaration as a Nature Reserve, the principal management requirements here, apart from the protection of the birds, is the cessation of vegetation burning. Stock grazing on the north-facing slopes need not be eliminated, at least to begin with, if this would generate too much antagonism from the village and always provided that the destructive activities of the herd boys towards all edible wildlife can be curbed in some way.

8.2. Spiral Aloe Reserve

The idea of establishing a Species Reserve to protect this endangered endemic is accepted in principle. One of the relict populations of Aloe polyphylla close to the Mountain Road was visited in the course of the present survey.

The ARC proposals for the establishment of a small fenced reserve here or elsewhere to preserve this species from complete extinction in the wild can be endorsed. The idea of propagating the aloe from seed in order to undercut the present commercial traffic is also a good one. The species could be introduced to other suitable Nature Reserves in order to increase the chances of final success. The upper Makhaleng area, where the aloes may already exist, would be a particularly good choice.

8.3. Woodland At Masitise Mission

The area of woodland at Masitise Mission is not "one of the finest stands of remnant natural vegetation with attendant bird species to be found in Lesotho". The site was visited and found to be a plantation of many different exotic trees in what might once have been a small patch of original scrub. The site could not be restored by removal of the exotics as there are too few indigenous species left and even the woodland floor has been drastically altered by spread of the introduced creeper Vinca. Unless the birds present are of really outstanding interest this site should not form one of the national Reserves but should be left in private hands. Better remnants of natural scrub exist at Qeme, Maphotong, the upper Makhaleng, the lower Quthing and doubtless elsewhere; although it is not known how the bird lists of these places would compare with Masitise.

8.4. Natural Vegetation Reserve Near Roma

The areas referred to on the sandstone escarpment northwest of the University campus are small and not of any national importance. If they are of educational importance to the University initiative in ensuring their protection should be left in University hands.

8.5. Tsa Kholo Lake And Reed Beds

The Tsa Kholo lake in Mafeteng District is a shallow body of water artificially maintained by a low dam and sluices on the Tsana Talana River at an altitude of just over 1,500 m. The lake lies in a basin of sandstone, which outcrops at some points along its eastern edge, although surrounded by low basalt hills. Much of the immediate catchment is under cultivation. According to a 1973 report by Mr. M.N. Mzamane, Curator of the Maseru Herbarium, the dam was last repaired in the decade 1950-60 and since then the lake has dried out once only, in the drought of 1972-73. Siltation has always been low, probably because of the number of small dams on the river system and because of the filtering action of the extensive reed beds upstream. Other plant communities of the flood plain are dominated by Cyperus, Eragrostis and Hyparrhenia. There is also an area of grazing marsh above the lake, with a second area 3 km upstream. Cyperus spp., reeds and three other species of tall grasses are protected for cutting over ten months of the year, while the flood plain and marsh is closed for nine months as traditional spare grazing (maboella). The remainder of the catchment is said to be under a grazing control scheme started in 1972.

The lake was visited in the course of the present survey on 16 January 1977 and a wide variety of birds seen in considerable numbers. These ranged from Bishop birds and several species of raptors on the flood plain to large numbers of storks, ducks, geese and waders among the taller reed beds and sandbanks at the southern end of the lake. The birds were being harassed by herdboys beating through the marshes with their dogs and several men were fishing among the shore reeds.

There is nothing comparable to this area elsewhere in Lesotho. The lake at Ongeluk's Nek could develop in the same direction in time but it lies at much higher altitude and at present attracts a different selection of birds and many fewer species. The lake and the floodplain to the east (above 300 ha in all) could be made into a valuable Nature Reserve (principally a Bird Sanctuary) without modifications. Variety and number of birds could be enhanced by simple habitat manipulations such as tree planting in places and the formation of small islands. At present the lake is used as a source of irrigation water by the Ministry of Agriculture and a scheme has been advanced by Fisheries Section of the Livestock Division (1976) for an eventual 350 ha of intensive fish farming ponds, with some rearing of domestic ducks as a sideline.

Plans have also been discussed for developing the lake as a water-based recreation center. If Fisheries' plans are implemented, beyond the 40 ha pilot trial proposed, the area will be lost to the local people for reed cutting and grazing.*

If the area is developed as a Nature Reserve most of these local activities including the withdrawal of water for irrigation, could continue under supervision. The only water-based recreation that would be compatible with the Reserve would be coarse fishing and dingy sailing on the lake. The water is too shallow and muddy for the other activities that have been suggested. The Reserve would not necessarily require perimeter fencing, as suggested in the ARC Report, but would require careful daylight patrolling by Rangers as an alternative. Hides and towers could be constructed although a spur of high land immediately to the east of the lake gives a useful natural vantage point.

* Further information on this plan indicates that the area of the proposed development lies immediately adjacent to the lake but downstream so that little or no land use conflict should be involved.

9. PERSONNEL TRAINING REQUIREMENTS

9.1. The training of suitable staff to man all levels of the proposed Parks and Reserves Organization poses many problems, not least the need for the programme of survey and acquisition to proceed while training is taking place.

9.2. The organization will require a Director and Deputy Director immediately the National Parks Act of 1975 becomes operative and a Board of Trustees has been appointed. Indeed, the Director will be a member of that Board. At the present time there is no suitably qualified Mosotho to take over the specialised role of Director and the post will require to be filled either by a three year secondment from some appropriate international organization such as UNEP or it will have to be advertised as a short-term contract by FAO, the UK Ministry of Overseas Development or similar body. The post of Deputy might be filled by a suitably qualified Mosotho in training to assume the Directorship after the period of expatriate contract or secondment has expired. It was pointed out in a technical paper by Fisheries Section of the Livestock Division, Ministry of Agriculture in April 1976 that there existed in Lesotho a severe shortage of suitable science graduates willing to enter agriculture and similar careers and able to fill vacancies as understudies at top management levels. The situation has not altered materially since then.

9.3. It has been suggested more than once, since contacts were first made during Lesotho Independence Celebrations in 1976 that suitable training for Wardens, Rangers and Game Guards could be obtained for Lesotho nationals in Tanzania. The most recent syllabus obtained from the College of African Wildlife Management at Mweka, Tanzania, suggests that the available courses are indeed comprehensive and most suitable. However, candidates are now required to have at least one year's practical experience for entry to the Certificate course and at least six months experience for the Diploma. No candidate from Lesotho could meet these requirements at present. Furthermore there is only one location in the country - Sehlabathebe - where suitable practical experience can be gained.

Finally there is only one prospective Mosotho candidate for the Post-graduate Diploma course at Mweka which would enable a national to fill the above post of Deputy Director. However, a Lesotho Cabinet Circular of September 1976 requires that Government employees serve a two year probationary period in the Kingdom before qualifying for training abroad.

Analysis of the Mweka syllabus reveals that the majority of the courses could be duplicated from expertise already available in Lesotho at the National University or in various Government Departments. These are :

Basic Science, Geography, Botany, Earth Science, Range Ecology, Ornithology, Biogeography, Invertebrate Zoology, Forestry, Surveying, Road & Building Construction, First Aid, Vehicle Maintenance & Plant Engineering, General and Office Administration and possibly Game Biology.

Specialist subjects relevant to the situation that will exist in Lesotho, and which could not be taught here at present, are Wildlife Management Techniques and Park Planning and Interpretation. It is suggested that Departments in appropriate Institutions in other African countries and overseas should be approached for staff on short-term secondment to teach crash courses in these subjects at Roma. Other specialist subjects at Mweka, which are not available in Lesotho, but can be discounted as not immediately relevant, are Use of Light Aircraft and Radio in Wildlife Management, Ballistics and Law Enforcement & Court Procedure. The basic training and the crash courses suggested could be built up in a few years to form Lesotho's own training school in environmental conservation. This is regarded as the most suitable solution in the long term. Among other things it would avoid the possibility of candidates trained outside the country becoming dissatisfied with Lesotho conditions and opportunities on their return.

Ranger training is also given at a school run by the R.S.A. Department of Bantu Administration but this is a three year course requiring eighteen months practical work at an approved center. Further details are not known. The Pasiansi Field Assistant Training School in Tanzania has been approached to provide a syllabus of courses but this is not yet available.

9.4. In order, therefore, to alleviate some of the effects of the inevitable hiatus in trained staff over the first three years of the Parks and Reserves Organization the following steps would be advisable :

- (i) Prospects for careers at all levels should be widely publicised in schools and on the Roma campus.
- (ii) Foreign institutions should be approached to learn the prospects of obtaining staff on short-term secondment for courses in Wildlife Management and Park Planning.

A situation is going to exist in which staff are needed to man Reserves and at the same time Reserves are needed in which to give candidates their qualifying practical experience. This vicious circle will have to be broken somehow and it can only be done by the use of untrained personnel, certainly at the smaller sites and possibly at the larger centers also. Many of the sites that have been proposed are small enough for a local, resident care-taker to be sufficient at least in the early years. Gaps will certainly have to be filled by untrained men while trainees are absent in Tanzania or on courses at Roma. The inevitability of such a hiatus should not be allowed to hold up the programme of Reserve acquisition as there is a rapid deterioration of quality at most of the proposals that have been examined.

9.5. The preliminary survey or inventory of ecosystems that has been suggested, to ensure that the best examples of each have been included in the conservation programme, cannot be manned entirely by Basotho at the present stage. The work could be put out to commercial contract, to be based on photo-interpretation, and for which international funding could be sought or, once again, appropriate Departments of Environmental Science or Natural Resources at foreign universities could be approached for staff on short term secondment or in vacation time.

9.6. The programme that has been outlined in this Report will eventually require - apart from the personnel of the Research and Survey Section - and assuming that the staff to cater for tourism comes from elsewhere, one Director, one Deputy Director, seven Senior Rangers (or Wardens) to take overall charge of the larger Reserves and eighteen to twenty Rangers of at least two junior grades. Within three to five years of inception all these posts can be occupied by Basotho. Posts would be distributed around the proposed Reserves somewhat as shown :

Sehlabathebe :	Senior	1	Junior	4
Lesotho N.P. :		3		10 (omitting Sehlabathebe)
Qeme :		1		2
Lower Quthing :		1		2
Upper Makhaleng :		1		2
Ongeluk :				
Tsa Kholo :			Caretakers or Junior Rangers	
Maphotong :				

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